University of Cincinnati

Date: 9/15/2011

I, Rachel McArthur , hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Criminal Justice.

It is entitled:

Unraveling the Sources of Adolescent Substance Use: A Test of Rival Theories

Student's name: **Rachel McArthur**

This work and its defense approved by:

Committee chair: Francis Cullen, PhD

Committee member: Cheryl Lero Jonson, PhD

Committee member: Paula Smith, PhD

Committee member: Pamela Wilcox, PhD

2006

UNRAVELING THE SOURCES OF ADOLESCENT SUBSTANCE USE:

A TEST OF RIVAL THEORIES

A Dissertation Submitted to the:
Graduate School of the University of Cincinnati

In Partial Fulfillment of the
Requirements for the Degree of

Doctorate of Philosophy (Ph.D.)

In the School of Criminal Justice
of the College of Education, Criminal Justice, and Human Services

2011

By

Rachel McArthur

BA, California State University Bakersfield, 2004
BA, California State University Bakersfield, 2005
MS, University of Cincinnati, 2007

Dissertation Committee: Francis T. Cullen (Chair)
Pamela Wilcox, Ph.D.
Paula Smith, Ph.D.
Cheryl Lero Jonson, Ph.D.

ABSTRACT

This dissertation tests the ability of four rival criminological theories to explain adolescent substance use: differential association/social learning theory, social bond theory, self-control theory, and general strain theory. Special attention is paid to whether the theories are general, as the inventors of the theories claim, or gender-specific to males, as critics of the theories claim. To undertake this theoretical assessment, a secondary analysis was conducted using data from the Rural Substance abuse and Violence Project (RSVP). The respondents, drawn from grades 7 to 12, were pooled across four waves. The N for this study is 9,488.

The empirical test revealed three main conclusions. First, measures of the components of differential association/social learning theory, social bond theory, self-control theory, and general strain theory were able to explain substance use among adolescents. Second, the theories had general effects across males and females and thus were not gender-specific. Third, because all perspectives earned some empirical support, they might best be seen not as theoretical rivals but as complementary theories that all contribute to our understanding of the sources of substance use among youths.

However, given the modest amount of variation explained in the analyses, future research on substance use may benefit from two extensions. First, most studies, including this dissertation, operationalize only parts of theories. The next generation of empirical tests should seek to measure all components of the major theories, thus truly assessing the models' explanatory potential. Second, a truly complete theory of substance use must build upon but not be limited to the major perspectives. Therefore, a need exists to examine the causal impact of factors—such as those unique to women or biological traits that shape conduct from childhood onward—that lie outside the traditional theories of crime.

ACKNOWLEDGEMENTS

This long and sometimes trying journey would not have been possible without the guidance, support, and love of some very significant people in my life. In this regard, I would like to take the opportunity to recognize and thank them.

First and foremost, I would like to thank Dr. Cullen for agreeing to embark on this process with me. You have been instrumental in my success and your guidance has been unparalleled. You are truly one of the most brilliant people in this field and I will be forever thankful for the opportunity to have been able to learn from you. Thank you for your support, your never-ending encouragement, and for all of the knowledge you have imparted on me. My road to becoming a scholar was certainly made possible because of you.

I would like to thank my committee members for their wonderful contributions throughout this process. Dr. Wilcox, thank you for your generosity with the use of your data. I have a new and true appreciation for what is required to obtain such a rich and comprehensive data set. Dr. Smith, thank you for your encouragement in response to my work. Your words made it much easier to push ahead when it would have been easier not to. Dr. Jonson, your guidance in all things statistics was instrumental in this process. You set such a good example with your work ethic and dedication. I thank you for your insight and your support.

One of the most influential people during graduate school has been Dr. Sandra Browning. Dr. Browning, thank you for always challenging me to think beyond what I thought I was capable of. You always allowed me to question, argue and learn in your classroom. It was in your classes that I fully developed my passion for teaching. There is no doubt that this passion was realized while experiencing yours. Thank you for always pushing me to be better.

I would like to thank Jenn Altman and Anna Lindseth for always being such amazing examples to me. You have both been my friends since the beginning of this journey and will continue to be so in all of my journeys to come. Thank you for loving me at times when it was difficult for me to do so. You both have always simply accepted me for who I am and have encouraged me to grow and change for the best. You are two of the most remarkable people I know. I still, as I did when I was nineteen, want to be like the two of you when I grow up.

Naomi, there is little doubt that I would be here were it not for your presence in my life throughout these past ten years. You, more than anyone, have seen me grow into who I am today. Thank you for helping me survive all of the times when my self-doubt was the strongest. The knowledge that you will always be there for me makes me one of the luckiest people there is.

I would like to say thank you to Jordan Loustalot. You have been with me from the beginning and you have often be my loudest voice of support. Thank you for constantly sticking with me throughout all of my hardships and for choosing to love me unconditionally. You are one of the most resilient people I know. Simply put, you are a survivor. I love you.

I would like to thank Kristin Ostrowski and Sally Miller. Thank you both for letting me lean on you when no one else would. Both of you know my heart and willingly love all of my pieces. You have no idea what that means to me. I am so grateful to have such strong women like the two of you in my life. I cannot wait to see where our sisterhood takes us. I love you both.

To my brothers, Philip and Benji, I thank you for putting up with me all the time. I know that sometimes it is difficult to have me as a sister, but I thank you for always loving me. I want both of you to know that you are two of the kindest, most thoughtful and strongest people that I

know. I am so proud to have you as my brothers and I hope that you know that I love the both of you unconditionally.

Ashley, thank you for your amazing support during this journey. There is no way that I could have persevered without your belief in me. You keep me grounded and yet will never stand in the way of my achievements. I am so grateful you are in my life and I cannot wait to see what happens next. I love you.

And lastly, I would like to dedicate this dissertation to my parents, Wayne and Susan McArthur. Thank you for your unwavering faith in me, your unmatched strength to endure and overcome, and for your unconditional love. This dissertation is as much yours as it is mine. I love you both.

TABLE OF CONTENTS

LIST OF TABLES AND APPENDICES

Chapter 1

EXPLAINING SUBSTANCE USE

Among any cohort of American youths, some will use drugs and alcohol whereas others will not. Further, some youngsters will not only use these illegal substances but also abuse them, at times wreaking havoc with their lives and ruining their futures. The purpose of this dissertation is to attempt to unravel this heterogeneity of substance abuse; that is, the intent is to contribute to our understanding of what influences the extent to which adolescents are involved in drug and alcohol use.

Toward this end, major theories of delinquency are employed. These "rival theories" focus on separate features of youths' personal orientations and social lives. Most often, these perspectives are presented as "general" theories—that is, as perspectives that claim to be all-encompassing explanations of youthful misconduct. This dissertation explores this claim of generality, attempting to see which of the major theoretical perspectives best accounts for substance use. The theories in the analysis include differential association/social learning theory, social bond theory, self-control theory, and general strain theory. Accordingly, the empirical analysis should provide insights both on the sources of substance use and on the relative merits of these rival models.

The dissertation employs a large data set that surveyed youths in Kentucky schools. Importantly, the survey instrument contained a variety of measures that assessed the orientations toward and experiences youths had not only outside the school environment but inside it. As a result, the study helps to explore whether substance use is produced by different social domains in youths' lives.

Finally, a key controversy in criminology is the extent to which the sources of misconduct are the same for males and females or are gender-specific. Because the sample includes both adolescent girls and boys, we are able to assess the extent to which the predictors of substance use identified by major theories are general or gender-specific.

This chapter begins with an overview of the extent to which adolescents are involved nationally in substance use. The point of this section is to show that illegal substance use remains a salient social problem in the United States. The next section reviews the theories that will be used to inform the empirical analysis. This discussion is followed by a review of the empirical literature in which these theories have been used to explain substance use. The chapter will then examine the issue of gender-specificity and how this has been explored in the previous empirical literature in the area of substance use. Finally, the research strategy for the dissertation will be set forth.

THE EXTENT OF ADOLESCENT DRUG AND ALCOHOL USE

The section below will outline the extent and trends of adolescent drug and alcohol use. Not only will the overall trends of alcohol and drug use among youths be scrutinized, but the differences in race, ethnicity and gender will also be examined. This section will also explain the effects of early onset of substance use along with the consequences of high risk behavior that often accompanies teenage drug and alcohol use.

The use of alcohol and other drugs during adolescence remains a serious public health problem, with the consequences existing both at a personal and societal level. Drug and alcohol use undermines motivation, cognitive processes, and increases the risk of accidental injury or death. At the societal level, drug abuse results in an increase in health care, alcohol and

substance abuse treatment, and juvenile crime (Hawkins, Cataloano, & Miller, 1992). Beyond the immediate consequences of adolescent drug use are longer-range implications that extend into adulthood. Drug abuse is involved in over one third of lung cancer cases and is a major factor in acquired immuno-deficiency syndrome (AIDS), violent crime, neglect, and unemployment. In sum, the problems associated with alcohol and drug use, particularly adolescent drug use, result in costs to productivity, loss of life, destruction of families, and an overall weakening of the bonds that hold society together (Hawkins et al., 1992).

Trends in Drug and Alcohol Use

Studying the extent and trends of adolescent drug and alcohol use is not a new phenomenon (Bachman, Johnston, & O'Malley, 1981). Nationally representative trends on drug use among youth did not exist prior to the 1970s. However, retrospective studies have suggested that the World War II birth cohort marks a major turning point in the use of illicit drugs (Jacobson, 2004). Of those born before 1940, less than 7% report having ever used marijuana by age 35. In contrast, in 1992, 12% of high school seniors reported using marijuana, which suggests that the prevalence rates of drug use began to rise throughout the 1960s and 1970s (Jacobson, 2004).

The Monitoring the Future (MTF) study design consists of nationally representative samples of about 17,000 12th graders located in 135 schools. Each year, beginning in 1975, samples are selected using a multistage scientific sampling procedure (O'Malley & Johnston, 1999). Using the MTF to gather findings from five nationally representative surveys of high school surveys from 1975-1979, Bachman et al. (1981) examined the trends of drug and alcohol use among adolescents. The most definitive findings were that males were more likely than

3

females to drink and use illicit drugs. The exception of this pattern was smoking. The study

found that above average drug use (among both males and females) occurs among those youths

that were less successful in adapting to the educational environment, spent multiple evenings out

for recreation, and had heavy time commitments, or above average incomes.

When examining just those high school seniors (N=3,500) who used marijuana,

Bachman, Johnston, O'Malley, and Humphrey (1986) found that those youths who perceived

considerable risk in the use of marijuana and/or disapprove of the use are relatively unlikely to

use marijuana on a regular basis. Conversely, those who used marijuana on a regular basis were

relatively unlikely to express strong disapproval or perceive high risk. Once the authors

controlled for attitudes, they found no decline in marijuana use from 1978 onward. Among those

who did not disapprove and did not perceive any risk, their monthly and weekly use of marijuana

increased in the late 1970s, which suggests that attitudes toward the use of marijuana are what

shape the shift in behavior (Bachman et al., 1986).

Around the same time, a longitudinal study in San Francisco revealed results that were

similar to the national trends described above (Keyes & Block, 1984). The percentage of

students who had ever tried alcohol was high (over 90%). While marijuana use was somewhat

lower than the national sample, the usage rates of illicit drugs such as cocaine and hallucinogens

were quite similar, with 12-19% of the sample saying they had used those "hard" drugs at some

point (Keyes & Block, 1984). The prevalence rate, according to Bachman et al. (1986) at the

national level was between 12-14%.

The most notable departure in the San Francisco study from the national studies at that

time, however, was age. The longitudinal sample was four years younger than the high school

seniors surveyed nationally. The study found that the transition to junior high school appeared to

play an important role in the initiation of substance abuse, with seventh and eighth graders demonstrating the highest levels of initial use. This finding may suggest that interventions for adolescent substance use needs to begin at an earlier age (Keyes & Block, 1984).

Trend data reported a near doubling of the rates of drug use among youth in the 1990s (Gilvarry, 2000). Using the MTF survey throughout the 1990s, Johnston, O'Malley, and Bachman (1998) reported alarming trends of drug use among youth. From the 1991-1996, rates of illicit drug use doubled among 10th and 12th graders. Use among 12-17 year olds increased from 5.3% in 1992 to 11.4% in 1997. The revival of drug use was also reported by the National Household Survey on Drug Abuse (NHSDA), which is an annual survey conducted by the Substance Abuse and Mental Health Services Administration (Gilvarry, 2000).

The MTF data from 1997 and 1998 reported a leveling-off of drug use for the first time in the previous six years, with the use of marijuana dropping significantly among 10th graders. That being said, with lifetime rates of any illicit drug use in 1997 of 29.4% for 8th graders and 54.3% for ninth graders, substance abuse among adolescents remained at a high level (Johnston et al., 1998). The MTF data also showed that during the 1990s smoking rates among youths in the United States was at its highest level in two decades. In 1998, nearly two thirds of 12th graders had at one point used cigarettes and almost 25% were daily users. In general, smoking among youths declined during the second half of the 1970s and early 1980s and leveled off during the late 1980s and increased during the 1990s (Nelson et al., 2008).

A study done by the CDC in 2004 showed that smoking was still a significant problem for adolescents. The CDC reported that 8% of middle school students and 22% of high school students had smoked at least once in the previous month. The study also found that people who initiate smoking earlier in life smoke more throughout their lifetime and will have a more

difficult time quitting than those who initiate smoking at a later age (Hoffman, Monge, & Chou, 2007).

Use of alcohol among 12th graders showed that 52% were current drinkers. Binge drinking remained at 25% and 31% of 10th and 12th grade students respectively. The MTF data also revealed the annual prevalence rates for amphetamine use among 8th graders to be 7.2% and 10.1% for 12th graders (Johnston et al., 1998).

Demographically the MTF data of 1997 revealed that the prevalence of both drinking and being drunk was highest in the Northwest region, although regional differences were small. Drinking rates differed only slightly according to population density, with somewhat greater differences existing in the rates of being drunk; students in rural areas having higher rates. Lastly, the data showed that higher parental education was associated with increased rates of alcohol use and of being drunk, while the relationship between family structure and drinking status was weak and inconsistent (O'Malley & Johnston, 1999).

In an effort to get a comprehensive picture of the overall trends of alcohol use during the 1990s, O'Malley and Johnston (1999) examined several major ongoing national studies that collected and evaluated information on alcohol use among adolescents. They considered Monitoring the Future (MTF), the National Household Survey on Drug Abuse (NHSDA), and the Youth Risk Behavior Survey (YRBS). The MTF and YRBS are school-based studies (the samples are drawn from high schools), whereas the NHSDA is a home-based study (the samples are drawn from the home, and the data is collected in interviews at home). The comparisons of these three surveys confirmed that alcohol use as well as alcohol-related problems continues to be highly prevalent among adolescents across the United States. In particular, excessive alcohol

6

use and the problems associated with it have appeared to have increased over the years. Further, rates of alcohol use had increased over all demographic subgroups (O'Malley & Johnston, 1999).

In 2005, the annual study undertaken from the MTF data showed a decrease in some drug use, a leveling-off of some, and an increase in other types of drug use (Johnston, O'Malley, Bachman, & Schulenberg, 2006). Those drugs that saw a decline in adolescent use were marijuana, amphetamines, methamphetamines, steroids, and the "club drugs" such as GHB, ecstasy, and alcohol. The drugs whose usage seemed to be leveling off were LSD, hallucinogens, crystal meth, and heroin. Drugs showing signs of increased usage among adolescents were sedatives, OxyContin, and inhalants.

Gilvarry (2000) argues that the prevalence of drug and alcohol use is not distributed uniformly across the general population of youths, and that there are certain youngsters who may be at a higher risk of using drugs. These high-risk youths may not be included in such surveys that target school and household samples (such as the MTF). These youths include those who are out-of-school and unemployed, run away or homeless adolescents, or involved in the juvenile justice system. The prevalence of drug use is high among run-away and homeless adolescents, which may contribute to, or make worse, their current homeless situation and mental health problems. Over 50% of these street youths reported the use of illicit drugs other than marijuana. Over 17% of this group reported intravenous use, which means that youths in these high risk youths are at an increased risk of infectious disease (Gilvarry, 2000).

Furthermore, among adolescents detained in the system in the year 2000, 56% of boys and 40% of girls tested positive for drug use (Chassin, Pitts, & Prost, 2002). In 2002, the substance use rate was 23.8% for adolescents ages 12-17 who had ever been in jail or spent time in a detention facility. This figure was found to be four times that of the 8% of youths in that

same age range that had never used drugs and had never been jailed or detained. Fifty-five

percent of male adolescent and 39% of female adolescent submissions into drug treatment

facilities come from the criminal justice system (Chassin et al., 2002).

Race and Ethnicity

Using MTF data from 1976-1989 to examine racial and ethnic differences of drug use

among adolescents, Bachman et al. (1991) found that Asian American youths tended to report

very low levels of drug use compared to other groups. Black youths consistently reported lower

rates of drug use than white youths, with Hispanics reporting higher rates of drug use than blacks

but slightly lower than whites. On average, the group reporting a higher rate for just alcohol use

was Native American adolescents.

Examining MTF data almost 20 years later, Nelson et al. (2008) showed similar results

within the last 30 years between different racial groups. Estimates for racial groups were similar

in the 1970s. However, by the 1980s, a prevalent gap appeared. Both Hispanics and blacks were

less likely than whites to smoke. By the early 1990s, smoking was almost four times more

common among whites than Hispanics and blacks. Recent studies have found that the trends

have remained the same, with black youths having lower rates of alcohol use when compared to

white youths, and Asian American youths having the lowest rates overall (Cheever & Weiss,

2009).

Gender

Gender-specific patterns of drug use among 12th graders have fluctuated from the 1970s to

the 1990s (Nelson et al., 2008). Prevalence rates among adolescent girls declined, while

smoking declined rapidly for boys before leveling out in the 1980s. In the 1990s, prevalence

rates for smoking among boys were consistently higher than girls, and stayed that way until

2005. Overall, smoking trends for adolescents were found to be nonlinear (Nelson et al., 2008).

Studies examining the association between alcohol consumption and gender have been

inconclusive, with some showing no gender effect and others showing gender as a risk factor for

alcohol use (Cheever & Weiss, 2009). Historically, studies have shown that substance use has

disproportionately been linked to males over females. Most studies support this trend of males

having higher rates of alcohol use, particularly heavy use, than females.

Recent research however, has begun to show that this trend is changing most dramatically

among younger youths, where prevalence rates have been shown to be very similar (Cheever &

Weiss, 2009). O'Malley and Johnston (1999) found that male students were more likely to report

drinking than female students, but only by a small margin (56%-49%). The gender difference

was greater, however, for having been drunk, with 39% of males saying they had been versus

29% of females.

Early Onset

The high prevalence of alcohol use among adolescents and the general escalation in use

while still being young are cause for concern. Evidence indicates that higher use of substances

in adolescence predicts higher use of the same and other substances in young adulthood as well

as increased problems related to drug use (Duncan, Alpert, Duncan, & Hops, 1997).

Kandel (1975) argued that drug use among adolescents does not begin with illicit drugs,

but with legal drugs such as beer or wine first, and subsequently cigarettes and hard liquor.

Longitudinal research has shown that adolescents at one particular stage of use risk further use of

other substances. For example, marijuana use may increase the risk of stimulant use, which may

then increase the risk of heroin or cocaine use. Those at one stage may not necessarily move onto the next stage, but the likelihood of doing so is increased (Swadi, 1999). In general, it is thought that marijuana may well be a proxy for some processes that place adolescents at greater risk for heavy drug use, particularly at a younger age (Getz & Bray, 2005).

It has been argued that lifetime prevalence of drugs use and dependence problems are higher for drug users who initiated drug use at an earlier age (under 15) compared to those who started at an older age (between 15 and 17 years of age) or as adults (Anthony & Petronis, 1995). The earlier these substances are used by the adolescent, the more likely they are not only to move on to illicit drugs, but to use them longer and further into adulthood (Hoffman et al., 2007).

Anthony and Petronis (1995) further argued that if in fact early-onset use does have an independent impact on risk of later drug problems; it might contribute to such things as developmental processes and adaptations during adolescence and the early adult years. Further, early-onset drug users were less likely to be able to escape any drug use at all, and were more likely than late onset users to have experienced any drug related problems. It is evident that there is a clear link to very early drug involvement to later levels of drug consumption (Anthony & Petronis, 1995).

Previous studies show that early binge drinking can be harmful and can have immediate effects such as crime involvement, and substance abuse/dependence. Danielsson, Wennberg, Tengstrom, and Romelsjo (2010) found that "high consumers" (heavy drinkers) and "sudden increasers" (sudden escalation in drinking as opposed to a gradual increase) reported more alcohol-related problems between the ages 14-16 as well as at age 19. They also reported that those adolescents who increased faster in their use at a young age had far more alcohol-related problems as young adults than those adolescents who had increased their drinking less rapidly.

10

The study further revealed that access to alcohol, having friends who drink, and smoking cigarettes led to an accelerated increase in high consumption and a sudden increase of the use of alcohol among adolescents. In addition to those findings, having poor health and visiting a youth recreation center made it more likely that adolescents would slowly increase their consumption of alcohol, meaning they were still at risk for later problems, but not as badly as those that qualified as high consumers. The implication from this study is that young adolescents who smoke cigarettes and have friends that drink, report poor health, and visit a recreation center are at high risk for consuming alcohol, which could lead to problems later in life (Danielsson et al., 2010).

High-Risk Behavior and its Consequences

There are a substantial number of adolescents who are placing themselves at risk of harm by driving after using drugs or alcohol, or riding when the driver has used illicit drugs or has been drinking alcohol (O'Malley & Johnston, 2007). Studies of drivers involved in fatal crashes will often find evidence of the use of drugs or alcohol, which suggests that these substances may increase the chances of being involved in a crash (O'Malley & Johnston, 2003).

Using the Youth Risk Behavior Surveillance System, which was developed by the CDC, Grunbaum et al. (2002) examined risky behaviors in which adolescents engage in; drinking and driving was one of them. They found that in the 30 days preceding the survey, almost 14% of the students said they had driven a car or some other vehicle more than one time after drinking alcohol. Male students were almost twice more likely than females to report accidents after using marijuana or drinking alcohol. Students in grade 12 (22.1%) were significantly more likely than students in grades 9, 10, and 11 (6.6%, 10.4%, and 16.7% respectively) to report this

behavior. When examining ethnicity and race, the study found that white and Hispanic students were more likely than black students to have driven after drinking alcohol (Grunbaum et al., 2002).

Grunbaum et al. (2002) also assessed the number of students who said they had ridden with a driver who had been drinking alcohol. They found that within the previous 30 days of the survey, 30.7% of students nationwide had ridden more than one time with a driver who had been drinking alcohol. Prevalence of riding with a driver who had been drinking ranged from 17.1% to 43.5% across state surveys and from 19.3% to 39.6% across local studies (Grunbaum et al., 2002).

Even though driving under the influence of alcohol accounts for a large portion of accidents, driving under the influence of illicit drugs accounts for a substantial portion as well (O'Malley & Johnston, 2007). The results of a survey done in 2001 by O'Malley and Johnston (2003) show that 16% of seniors reported having driven at least once in the past two weeks after drinking alcohol; compared to 15% after smoking marijuana. Even though alcohol consumption is still more prevalent overall than marijuana use, the fact that the use of these two substances while driving is almost equal suggests that teens are less likely to drive after drinking than they are after smoking marijuana.

The National Study on Drug Use and Health Reported that in 2002 about 5% of the total U.S. population age 12 years or older drove under the influence of an illegal drug within the past year, and in the previous year, 20% of high school students with driver's licenses had driven after using marijuana (O'Malley & Johnston, 2007).

Using data from six annual surveys from 2001 to 2006, O'Malley and Johnston (2007) investigated samples of high school seniors on driving after the use of marijuana, other illicit

drugs, drinking alcohol and heavy drinking. Of these four behaviors, the one with the highest

prevalence was for drinking alcohol, with 14.2% reporting they had driven at least once in the

prior two weeks after having drunk alcohol. Those that reported driving after the use of

marijuana was 13.1%, which was only slightly higher than the 9.5% who had reported they had

driven after heavy drinking (having five or more drinks). A total of 18.2% reported driving in

the prior two weeks after illicit drug use or heavy drinking (O'Malley & Johnston, 2007).

The most alarming finding in this study was the high number of high school seniors who

repeatedly put themselves at risk by driving after drinking, smoking marijuana, using other illicit

drugs, and engaging in heavy drinking. There is no doubt that these activities were likely to

impair their driving performance, and beyond that, this behavior is not only illegal but also

highly dangerous for themselves and for others. In 2006, 30% of high school seniors reported

driving after drinking heavily or using drugs, or riding with someone who had engaged in these

behaviors. It is important to note that the reporting interval in this study was just the prior two

weeks. There is no doubt that over the course of a year, the percentage exposed to this risky

behavior would be much higher. It is clear that impaired driving by adolescents remains a

problem that needs serious attention (O'Malley & Johnston, 2007).

Another reason for concern about the use of illicit drugs and alcohol among adolescents

is the risk of social, medical, and legal problems that can result from the consumption of these

substances (O'Malley, Johnston, & Bachman, 1998). Weakened performances at work and

school, problems with friends and family, and physical and psychological impairment are just a

few of the consequences of drug use. In addition to later substance use and substance use

problems, adolescent drug use has been shown to be related to deviant behavior, as well as drug-

related crimes (Duncan et al., 1997).

13

Using an MTF survey, O'Malley et al. (1998) explored alcohol-related problems reported by high school seniors surveyed between 1994 and 1997. These seniors reported to have consumed alcoholic beverages on at least ten occasions in their lifetime. Fifty-two percent of responders said the use of alcohol has caused them to behave in ways they later regretted and 30% reported that it had interfered with their ability to think clearly. Nineteen percent said drinking had interfered with their relationships with their friends and parents, and overall, 34% reported having experienced three or more problems as a result of consuming alcohol (O'Malley et al., 1998).

The study described above is consistent with the results of other studies. Among teenagers who reported drinking (83.8%), Arata, Stafford, and Tims (2003) found that they had reported such problems as a hangover, getting into arguments because of drinking, and being unable to remember part of the evening. One-fourth reported having passed out or blacked out completely. Beyond that, nearly one-fourth reported engaging in sexual behavior that they would not have engaged in otherwise.

Based on these considerations, alcohol and illicit drug use among adolescents appears to be a serious problem. The evidence indicates that a sizable number of adolescents frequently engage in the consumption of alcohol and other illicit drugs. It is also evident that these behaviors can lead to serious consequences for youths, as well as negative consequences that can last into adulthood (Arata et al., 2003).

RIVAL THEORIES OF JUVENILE DELINQUENCY

The major theories of delinquency are reviewed below. The focal point of these major theories or "rival theories" is the personal characteristics and social lives of youths. These

theories are often presented in the context as general theories, or theories that can explain

delinquency in every context and every situation. The theories reviewed below are those that will

be used to enlighten the empirical analysis of this paper. The theories in the analysis include

differential association/social learning theory, social bond theory, self-control theory, general

strain theory,

Differential Association Theory

Edwin Sutherland's (1947) differential association theory was instrumental in bringing

the sociological perspective of crime to the forefront. Before this theory, criminological research

tended to be eclectic, unorganized, and lacked any theoretical foundation to guide and integrate

any findings from research. Over the years, differential association has fueled theoretical

revisions and improvements, along with the implementation of programs and policies (Matsueda,

1998).

In the early years of his career, Sutherland relied on what was then referred to as a

multiple factor theory to explain the causes of crime. According to this theory, crime has many

causes, such as poverty, broken homes, alcoholic parents, bad housing, mental deficiency, or any

other behavior that may account for the appearance of criminal behavior in an individual (Warr,

2001). Sutherland however, desired a more parsimonious and clear explanation of criminal

behavior. He understood the need for criminology to be more scientific and logical in explaining

why people engaged in deviant behavior (Warr, 2001).

It was not until 1919 when he joined the sociology department at the University of

Illinois that he wrote the first of several editions of his now famous textbook *Principles of*

Criminology. It was this textbook in which his theory of differential association first appeared and began to evolve (Warr, 2001).

One of the major influences of Sutherland's differential association theory stemmed from the research and ideas that were emerging from the University of Chicago, particularly those of Shaw and McKay (Warr, 2001). Shaw and McKay (1942) observed that juveniles were often drawn into crime through their association with older siblings or gang members. This observation led them to argue that disorganized neighborhoods helped to produce and sustain "criminal traditions" which competed with normative values and could be transmitted from one generation to the next. In other words, generations would pass along the deviant values, customs, and beliefs to others which helped maintain the criminal nature of those areas.

Sutherland (1942) systematically built upon the notion that delinquent values are transmitted from one generation to the next. For him, the idea that the preference for crime is culturally transmitted was to say that criminal behavior is learned through social interactions. Sutherland (1942) observed that societies exhibit normative conflict. Within each society, there are cultural patterns favoring criminal behavior that exists alongside patterns that are unfavorable to crime. Sutherland (1942) went on to state that people are exposed to a range of these opposing cultural messages, mainly through social interaction (Tittle, Burke, & Jackson, 1986). To Sutherland then, this interaction or social transmission of delinquency occurs specifically through transference of attitudes about crime (Warr & Stafford, 1991).

Differential Association. Differential association refers to direct association and interaction with others who engage in certain kinds of behavior or express norms, values, and attitudes towards such behavior (Akers & Jensen, 2006). The process of differential association explains how normative conflict produces individual acts of crime. According to Sutherland

(1947), criminal behavior is learned in communication with other persons, particularly intimate ones. It is in these groups that that all the mechanisms of social learning operate (Akers & Jensen, 2006). The content of this learning particularly that of deviant behavior consists of two sets of elements. One is the techniques and skills for committing crimes, which vary from the simple to the complicated. The second, and more important, set of elements learned are the specific directions of motives, drives, rationalizations, and attitudes, which can be used to define the law as a set of rules to be followed or to be broken (Matsueda, 1998).

Criminal behavior will result when an individual learns an excess of definitions favorable to crime over definitions unfavorable to crime (Sutherland, 1947). Differential associations may not each have equal weight and therefore may vary according to priority, duration, frequency, and intensity (Matsueda, 1998). Therefore, those associations that occur earlier, last longer, take place most often, and involve others with whom one has the closer relationship will have a greater effect on behavior (Akers & Jensen, 2006). It is the ratio of these definitions or views of crime, whether conventional or criminal, are stronger in a person's life that determines whether the person views crime as adequate way of life (Tittle et al. 1986).

Definitions. Definitions are one's own orientations, rationalizations, justifications, and excuses that lead to one in determining whether an act is more right or wrong, appropriate or inappropriate, or justified or unjustified (Akers & Jensen, 2006). Definitions include those learned from conventional norms and values that are favorable to conforming behavior and unfavorable to committing any crime. Cognitively, definitions provide a mind-set that makes an individual more willing to commit the act when the opportunity is perceived. Behaviorally, they affect the engagement of criminal behavior by serving as internal discriminative stimuli in conjunction with external descriptive stimuli (place, time, presence or absence of others). These

17

provide signals to the individuals as to what kind of behavior he or she has the opportunity to exhibit in a particular situation (Akers & Jensen, 2006).

It is important to note that definitions favorable to crime do not necessarily mean that one will be motivated to act. Instead, they are tenuous conventional beliefs that do not function as definitions unfavorable to crime. Rather, they are learned, as approving, justifying, or rationalizing attitudes. These attitudes are what will facilitate law violation in the right set of circumstances by providing approval, justification or rationalization (Akers & Jensen, 2006).

Propositions. Even though Sutherland published his first textbook on differential association in 1919 it was not until 1947 that the final stage of development of the theory was completed. Sutherland stressed that a scientific generalization should provide a necessary and sufficient explanation of crime, by identifying those conditions that are always present when crime is present and always absent when crime is absent (Matsueda, 1998). Sutherland argued that what was needed for both understanding and controlling crime was a set of interrelated propositions that together explained all the observed correlates of crime (Matsueda, 1998). It was through these propositions that Sutherland was able to show that the difference between offenders and non-offenders is not in their individual genetic make-up, but in what they have learned. The nine propositions are as follows:

1. Criminal behavior is learned

2. Criminal behavior is learned through interactions with other persons in a process of communication.

3. The principle part of the learning of criminal behavior occurs with intimate personal groups.

4. When criminal behavior is learned, the learning includes (a) techniques of committing the crime, which sometimes are very complicated, sometimes are very simple; [and] (b) the specific direction of motives, drives, rationalizations, and attitudes.

5. The specific direction of motives and drives is learned from definitions of legal codes as favorable and unfavorable.

6. A person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law. This is the principle of differential association.

7. Differential association may vary in frequency, duration, priority, and intensity.

8. The process of learning criminal behavior by association with criminal and anti-criminal patterns involves all the same mechanisms that are involved in any other learning.

9. While criminal behavior is an expression of general needs and values, it is not explained by those general needs and values since noncriminal behavior is an expression of the same needs and values (Sutherland & Cressey, 2003 p. 131-133).

The crux of the theory is explained in propositions one and eight. It posits that criminal behavior is learned and that the process of learning deviant behavior is the same process that conventional behavior is learned. Sutherland was aware that these statements did not sufficiently describe the learning process. However, they leave no doubt that differential association theory was meant to be a general explanation of crime (Burgess & Akers, 1966).

In his search for a general theory of crime, Sutherland attempted to apply sociological thought to the study of crime. In doing so, he stressed the importance that criminal behavior should not be studied as an isolated category of human behavior but as a social process. Sutherland believed that the causes of criminal behavior were extrinsic rather than intrinsic to the individual. Overall, there is no denying that Sutherland's general theory of crime has had an immense impact on modern criminology (Warr, 2001).

Criticisms of Differential Association Theory. Kornhauser's (1978) work presented what could be seen as a devastating critique of differential association (Akers, 1996). In this work, she proceeded to categorize the major theories of crime into cultural deviance (differential

association went into this category), strain, and disorganization perspectives. Kornhauser (1978) then argued that disorganization theories were theoretically and empirically superior. Matsueda (1998) argued that forcing differential association into an oversimplified description of cultural deviance theories misconstrued Sutherland to the point of reducing his theory to a mere caricature.

Kornhauser argued that differential association was really a cultural deviance theory. Her critique refuted the underlying assumption of cultural deviance theories that there are two oppositional cultures. In other words, cultural deviance theory rests on the assumption that subscription to deviant values requires individuals to violate norms of other groups if they are in conflict with one's own groups norms. Based on this assumption, Kornhauser argued that individuals themselves cannot be deviant, only cultures and subcultures can engage in criminal behavior.

Akers argues that differential association was explicitly designed to account for individual variations in criminal behavior, not differences in rates of crime across groups. He further states that Sutherland made a clear distinction between differential association theory as a theory of individual behavior and differential social organization as a theory of group differences. Kornhauser does not, Akers argues, make this distinction.

Kornhauser (1978) continued her assault by asserting that the differential association process in criminal behavior was one in which the internalization of definitions favorable to crime require criminal behavior. Warr and Stafford (1991) added to this argument by claiming that the link between attitude and behavior is tenuous. They argued that it would not be difficult to imagine that youths might commonly engage in criminal behavior for social and situational reasons. This does not mean, however, that the youths necessarily personally agreed with or

condoned the behavior in which they engaged in. Moreover, Warr and Stafford (1991) proposed that even if pro-criminal attitudes were a necessary condition, it does not imply that they are a sufficient one.

Akers (1996) replied to this critique by claiming that definitions that are favorable to crime and internalized by an individual simply allow for criminal behavior. Costello (1997) argued, however, that this position taken by Akers only serves to produce more problems for the theory than it actually solves. Hirschi (1996) further adds that Sutherland in his sixth proposition explaining the theory, suggested that an excess of definitions, whatever their content, produces crime.

Overall, where Sutherland was adamant that crime and values were compatible concepts, Kornhauser argued that one negated the other. Where Sutherland believed in the attribution of rape, murder, theft, and fraud to definitions favorable to them, Kornhauser stated that no culture can be in favor of such behavior. Sutherland believed that the content of culture is unrestricted, whereas Kornhauser believed that culture must be compatible with human nature and experience (Hirschi, 1996; Kornhauser, 1978; Sutherland, 1947).

Warr and Stafford (1991) argued that the most commonly cited evidence for differential association was at best only indirect evidence for the theory. The association between delinquent peers and delinquent behavior clearly speaks to the relevance of peers. It does not say, however, anything about the mechanism through which deviant behavior is transmitted. In other words, the associations itself cannot be construed as evidence of attitude transmissions from one youth to the next. Akers, in his social learning theory, has extended Sutherland's theory by explaining the mechanisms through which people learn (Warr & Stafford, 1991).

Social Learning Theory

Social learning theory is a general theory of crime that has been applied to a wide range of deviant and criminal behavior. While stressing the importance of differential association in shaping the definitions that can produce criminal behavior, Akers, Krohn, Lanza-Kaduce, and Rodosevich (1979) moved beyond that concept by specifying the dimensions of these definitions. He explained that some definitions are general, such as religion or moral values, some definitions are specific to certain situations, and some definitions are positive or negative towards criminal behaviors (Akers et al., 1979). Other definitions could be considered neutral, in the sense that they could justify or excuse certain behavior (Akers, 2000).

Sutherland (1947) and the early Chicago theorists argued that criminal values are learned through associations. None of these theorists, however, fully explained how the learning process occurred (Akers, 2001). In his eighth proposition, Sutherland (1947) asserted that all the mechanisms of learning are involved in criminal behavior. What he did not explain, however, were the mechanisms of this process. These mechanisms were first explained by Burgess and Akers (1966) in their differential-reinforcement theory. This theory was first proposed by Burgess and Akers (1966) as a reformulation of Edwin Sutherland's (1947) differential association theory. Burgess and Akers (1966) sought to integrate Sutherland's theory with the principles of learning. In doing so, they restated Sutherland's principles of differential association in terms of operant and respondent conditioning. Borrowing from the field of operant conditioning, Akers et al. (1979) theorized that social reinforcements such as rewards or punishments are what determine continued involvement in criminal behavior. Behavior is strengthened through reward (positive reinforcement), meaning the probability that an act will be committed or repeated is increased by rewarding outcomes or reactions. These reactions might

include obtaining approval, money, food, or a pleasant feeling. Avoidance of punishment (negative reinforcement) or the escape of aversive or unpleasant events will increase behavior.

Differential Reinforcement. Differential reinforcement refers to the balance of anticipated or actual rewards and punishments that are consequences of behavior. Whether an individual will refrain from committing a crime at any given time depends on the balance of past, present, and anticipated rewards and punishments for their actions. This balance is also what determines whether that individual will continue to desist from crime in the future (Akers & Jensen, 2006). The greater the value, frequency, and likelihood of reward for deviant behavior, the greater the probability that it will be repeated. This likelihood is balanced against the punishing consequences and rewards/punishment for alternative behavior.

It is possible for the reinforcers and punishers to be nonsocial, such as the direct effects of drug and alcohol use. Social learning theory, however, posits that learning criminal and deviant behavior is the result of direct and indirect social interactions with others. Due to this, the words, responses, presence, and behavior of other individuals directly reinforce behavior, provide the setting for reinforcement, or provide for a medium through which other social rewards (or punishments) are made available (Akers & Jensen, 2006). The balance of reinforcement may encourage individuals to engage in crime even if they possess definitions unfavorable to those acts. However, these acts are most probable when the balance of the reinforcements and the balance of the individual's definitions are in the same deviant direction (Akers & Jensen, 2006).

Imitation. Imitation refers to the engagement of behavior after the direct or indirect observation of similar behavior by others (Akers & Jensen, 2006). Sutherland's differential association theory implied that once definitions were internalized, they would continue to

regulate people decisions. Akers et al. (1979) agreed with this view, but he also elaborated by stating that in addition to definitions, people can become involved in crime through imitation or through modeling criminal behavior. Both definitions and imitation are crucial in determining whether an individual is going to initially engage in criminal behavior. Whether or not the behavior modeled will be imitated depends on the characteristics of the models, the behavior observed, and the observed consequences of the behavior (Bandura, 1979). Imitation is more important in the initial acquisition of the behavior rather than in the maintenance or cessation stage (Akers and Jensen, 2006).

     The Social Learning Process. The social learning process is dynamic and has reciprocal and feedback effects. In operant conditioning, reinforcement is a response-stimulus-response process. In other words, behavior produces consequences that in turn produce the likelihood of that behavior of continuing (Akers, 1990). In this theory, reciprocal and sequential effects of social learning variables, and deviant (or conforming) behavior are recognized with an emphasis of the effects of learning variables on deviant behavior. The temporal sequence in the process of an individual initiating deviant behavior is said to be the balance of learned definitions, imitation of criminal models, and the anticipated balance of reinforcement for that behavior. After initiation, reinforcers and punishers affect whether or not the acts will be repeated and at what level of frequency.

     Social learning theory does not state that definitions favorable to crime only precede and are not affected by the initiation of deviant behavior. Criminal behavior can occur without any thought given to right or wrong at the moment. Definitions can be applied by the individual retroactively to excuse or justify behavior that has already been committed. The extent that these

24

justifications or rationalizations are successful in mitigating others' negative responses is a sign

that those deviant acts can be repeated (Akers & Jensen, 2006).

Akers' (1990) social learning theory is a behavioral approach to socialization that

includes an individual's response to rewards and punishments, the learned patterns of response in

situations, and the anticipated consequences of actions. These consequences apply to the

present, and in the future the initiation, continuation, and cessation of these actions. Social

learning views the individual's behavior as responding to, and being conditioned by,

environmental feedback and consequences.

Social learning theory is not competitive with differential association theory. Rather, it is

a broader theory that retains all the differential association processes and integrates it with

differential reinforcement and other principles of behavioral acquisition. Thus, research findings

that support differential association theory also support the more integrated theory of social

learning (Akers, 2003).

Social Bond Theory

Hirschi's (1969) *Causes of Delinquency* is a standard for theory construction and research

in the field of crime and delinquency. The foundation of the theory is that human behavior is not

inherently conforming, "but that we are all animals and thus are naturally capable of committing

criminal acts" (Hirschi, 1969, p. 31). Since the assumption is that criminal behavior is intrinsic

to human behavior, then it is conformity that must be explained (Wiatrowski, Griswold, &

Roberts, 1981). According to Hirschi (1969) conformity is achieved through the formation of a

bond between an individual and society. The strength or weakness of this bond is what

determines whether an individual will conform. In other words, delinquency occurs when these social bonds are weak or absent.

Hirschi's (1969) intent was not to develop another control theory, but rather to challenge the two main theories of that time which were Sutherland's differential association theory and Merton's strain theory. He asserted that these two theories were asking the wrong theoretical question: Why were people motivated to commit crimes? Hirschi (1969) stressed that motivation was not something that required any explanation. If humans intrinsically turn to crime for gratification, then they did not need to learn to commit crime, or be driven to crime due to immense strain in their lives. The correct theoretical question Hirschi (1969) argued, was to ask: Why people do not break the law? Therefore, the difference between those that engaged in criminal behavior and those that did not are the factors that restrained them from committing such acts.

Even though Hirschi was not the first to develop a control theory, by the early 1970's his theory of social bond became the most dominant of all control theories. Social bond theory asserts that deviant behavior occurs when the mechanisms that prevent such behavior are not working correctly. Those youths who have weak bonds with society are more likely to engage in deviant behavior (Lagrange & White, 1985). For Hirschi (1969), characteristics that other control theorists took to be that of personality were causes maintained by the furtherance of social relationships that he coined as social bonds. Control theorists at that time focused on the concept of internalization, or the process by which social norms are internalized to the point that they become part of the personality structure.   Hirschi argued that this premise was based on the false assumption that individuals are fundamentally moral as a result of having internalized norms during socialization.

Hirschi's (1969) prescription of social control theory is based on the principle that "delinquent acts result when an individual's bond to society is weak or broken" (p. 16). Four discrete elements contribute to this bond: attachment to others, commitment to conventional lines of action, involvement in conventional activities, and belief in conventional values (Greenberg, 1999). The stronger each element of the social bond, the less likely the individual will engage in deviant behavior (Wiatrowski et al., 1981).

Attachment to Others. Attachment corresponds to strength of ties a juvenile forms to other significant individuals (Wiatrowski et al., 1981). Particularly, attachment to peers and parents with an inverse relationship between both measures and delinquency (Krohn & Massey, 1980). In other words, attachment was used to exemplify the continuing intimacy of interaction between the child and the parents or his or her teacher. This interaction is reflected in the parent's direct control over the child. Direct control is when the parent is physically present to supervise the child and, when necessary, to correct or punish misbehavior.

Hirschi (1969) extended the concept of attachment by explaining why some juveniles do not engage in criminal behavior when their parents are absent or not present. Hirschi proposed that indirect control is only effective when a child strongly cares about the opinions and expectations of his or her parents. Therefore, attachment exerts indirect control because parents are able to curtail criminal behavior through their psychological presence rather than their physical presence. The family environment is the main source of attachment because the parents are role models and teach their children socially acceptable norms. The implication, then, is that juveniles who are not strongly attached to their parents are unaffected by their parents' opinions. Therefore, juveniles with weak attachments will not be bound by their parents' norms, meaning

27

they will be less likely to consider the opinion of their parents when deciding whether or not to engage in delinquent behavior (Rankin & Wells, 1990).

   Commitment to Conventional Lines of Action. Commitment reflects the cost involved in engaging in illicit activities. Juveniles who are doing well in school and have bright prospects for a successful career are less likely to engage in behavior that will put their future at risk (Hirschi, 2003). In other words, those youths who are committed to conventional lines of activity place more of an effort into the participation of those activities. These individuals are more likely to conform because they do not want to endanger their personal investment (Krohn & Massey, 1980). An individual's stake in conformity will have an effect on their choice of friends. Those youths with high stakes will tend not to associate with individuals who have low stakes since the latter are more likely to be deviant. Youths with low stakes, however, will tend to avoid those with high stakes and choose peers that have congruent interests and be more likely to engage in delinquency (Briar & Piliavin, 1965). For Hirschi (1969) commitment was the element of the social bond that was the "rational component of conformity" in which the individual rationally calculated the potential gains and losses of his or her behavior. When contemplating a criminal act, the individual must consider the cost of this behavior and the risk of losing any investment that has been made in conventional behavior.

   Involvement in Conventional Activities. Hirschi (2003) simply argued that the simple involvement in conventional activities facilitated control. A day filled with activities meant that juveniles would simply not have enough time to engage in crime. Those youths with no activities in their life would have more of an opportunity to engage in criminal behavior. Although Hirschi attempted to separate involvement from commitment some argue that it is difficult to see this element with the same clarity as the other elements of social bonds. For

example, it is hard to imagine that an individual would be committed to an activity without considerable investment of time and energy. It is even harder to see how that individual would be committed and engrossed in activities to which they are indifferent. Instead of being viewed at a separate element, some argue that involvement should be seen as an indicator of commitment (Krohn & Massey, 1980).

Belief in Conventional Values. Hirschi (2003) proposed that youths who hold a belief in conventional norms of society are more likely to obey them. Those youths that do not hold strong beliefs in conventional values are freed from the bond and are more likely to engage in deviant behavior (Krohn & Massey, 1980). Hirschi (1969) is careful to differentiate his element of belief to that of the concept of definitions in differential association theory by stating that control theorists focus on beliefs that proscribe crime. He continues to state that "delinquency is not caused by beliefs that require delinquency, but rather made possible by the absence of beliefs that forbid delinquency" (Hirschi, 1969 p. 198).

Criticisms of Social Bond Theory. Although it can be argued that social bond theory has been the benchmark for control theories since its conception, many feel as though the theory's empirical support lacks complete explanation (Wiatrowski et al., 1981). Some argue that Hirschi did not consider how the four elements might act simultaneously to affect the probability of deviant behavior. Hirschi focused on the relationship between the four elements (attachment and commitment, commitment and involvement, and attachment and belief) in predicting delinquent behavior. Some stress, however, the importance of looking at the relationships among the elements of the bond (Wiatrowski et al., 1981).

Another perceived weakness of the theory is the question as to why there were only four elements that were identified. The predictive power of Hirschi's constructs was only modest,

which may suggest that there may be additional elements of the bond that need to be identified (Wiatrowski et al. 1981). In addition to this, Hirschi did not consider how these elements were affected by forces outside of the close proximity of the juvenile. By only focusing on the youth's social context of family and school, there was no explanation on the formation of social bonds at a larger scale within society.

Self-Control Theory

The publication of Gottfredson and Hirschi's (1990) *General Theory of Crime* generated considerable interest and debate. The authors presented a provocative theory that directly and vigorously challenged (1) criminal careers research; (2) most crime control policies and interventions; (3) explanations of crime based on situational and structural factors; and 4) other discipline-specific explanations of crime (Gibbs & Giever, 1995). Gottfredson and Hirschi (1990) placed crime in the context of human action, which posits that all human behavior is motivated by self-interest and reflects the universal desire to experience pleasure and avoid pain. Humans, in short, seek easy, immediate gratification. Crimes, therefore, are acts that result in short-lived benefits by increasing pleasure or decreasing pain.

Gottfredson and Hirschi (1990) argued the purpose of the theory was very clear: to identify and explain criminality and then relate it to criminal behavior. They further explained that crime will rise and fall during a lifetime, but differences in the likelihood of committing criminal acts do not follow the same pattern. Therefore, according to Gottfredson and Hirschi, the unchangeable element is criminality, or the tendency of individuals to engage in or restrain from criminal behavior. The authors proposed that criminality is established early in life. Children who get in trouble in second and third grades increase the probability they will be in

trouble at 15 and 16. These troubled juveniles are highly likely to get into trouble when they are

in their early twenties. Criminality is a state Gottfredson and Hirschi (1990) labeled as low self-

control and suggested that the causal relationships established in sociological theories of crime

are spurious. In other words, the individual differences in levels of self-control are what account

for why criminal behavior is widespread among those who fail at school, are unemployed, have

weak social bonds, and associate with other offenders. In their view, positivist theories make the

mistake of not allowing individuals to make decisions. Individuals do not simply end up in bad

marriages, or have deviant friends, or fail to maintain stable employment. Instead, these

divergent pathways are chosen depending on whether individuals give into easy gratifications

that have long-term consequences, or whether they exercise restraint (Evans, Cullen, Burton,

Dunaway, & Benson, 1997).

  Elements of Self-Control. Criminal acts provide immediate gratification of desires. A

major characteristic of individuals with low self-control is the need to respond to tangible stimuli

in their direct environment. These individuals tend to possess an inability to recognize long-term

consequences. Gottfredson and Hirschi (1990) use the term low self-control to explain criminal

propensity that increases the probability that individuals will be unable to resist the easy,

immediate gratification provided by crime, and by behaviors "analogous" to crime, such as

drinking, drug use, unsafe sexual practices, and risking accidents by driving at high speeds.

Those individuals lacking self-control are characterized as "impulsive, insensitive, physical, risk-

taking, short sighted, and non-verbal" (Gottfredson & Hirschi, 1990, p. 90). These elements of

low self-control are in many ways reflective of their view of crime. They contend that crime is

easy to commit, that it requires minimal planning, involves few physical skills, and provides

immediate gratification. It is not surprising then, that the characteristics of an offender are that

of low self-control, impulsive, insensitive and so on (Pratt & Cullen, 2000).

Although Gottfredson and Hirschi (1990) describe the elements of self-control as

separate characteristics, they stress that these elements form a unitary underlying propensity.

They also concede that this criminal propensity does not guarantee that criminal activity will

occur. Many noncriminal acts analogous to crime (smoking, accidents, and alcohol use) are

manifestations of low self-control. The implication is then, that there is no specific act or type of

crime that is required by the absence of self-control (Hirschi & Gottfredson, 2001).   In any

given situation, low self-control will lead to a crime or analogous behavior only when the

opportunity to commit crime is present. Even though there is a clear link to opportunity and self-

control, the authors seem to put more emphasis on the role self-control has in explaining

individual differences in crime and analogous behaviors. Individuals may vary in levels of self-

control, but opportunity to engage in crime is everywhere. It is after all, easy to commit and

requires little planning (Pratt & Cullen, 2000).

Gottfredson and Hirschi (1990) propose that self-control is "natural" and "universal."

Using this proposition, the question is not "Why do they do it?" but rather "Why don't they do

it?" Viewed from this perspective, low self-control can be seen as the universal propensity to

engage in acts such as crime that provide instant gratification. Therefore, within a birth cohort

there is no initial variation in the propensity to engage in criminal behavior.   Presumably,

biology can be seen as the cause of low self-control under the assumption that all human beings

seek gratification. According to Gottfredson and Hirschi, however, biology does not explain the

variation in self-control, because at birth, it is universal (Cullen, Unnever, Wright, & Beaver,

2008). Self-control or the presence of self-control is what requires explanation. Self-control is

not a natural phenomenon, but must be internalized. Gottfredson and Hirschi (1990, p. 95) state "there will be little variability among people to see the pleasures of crime." However, "there will be considerable variability in their ability to calculate potential pains...Everyone appreciates money; not everyone dreads parental anger or disappointment upon learning that the money was stolen." For these theorists, the explanation of the variation in self-control could be explained by the individual who cared the most about instilling it in the child: parents.

Causes of Low Self-Control. According to Gottfredson and Hirschi (1990), individuals with low self-control are a product of an insufficient upbringing. They describe self-control as an enduring personality characteristic, or trait that is established early in life and requires certain conditions of child rearing and parental management (Gibbs & Giever, 1995). They contend that low self-control is not produced by training or socialization, but rather, that the characteristics of low self-control tend to reveal themselves in the absence of training and socialization (Gottfredson & Hirschi, 1990). In other words, the amount of self-control that is acquired by the child is due to the effectiveness of the parenting that a child receives during socialization (Cullen et al., 2008). Those parents that care about their children will monitor them, acknowledge misbehavior, and punish it when it occurs. This direct social control by parents is what creates social control. Therefore, the roots of low self-control are reflective of ineffective or poor parental management of the child-rearing process (Cullen et al., 2008).

Self-control is instilled early in life from parents who care enough about their children to make the effort to consistently discipline him or her. This is a strong assertion as it suggests that there are no other sources of self-control. The minimum conditions to teach child self-control are (1) to monitor the child's behavior, (2) recognize deviant behavior when it occurs and, (3) punish such behavior (Gottfredson & Hirschi, 2003).

Gottfredson and Hirschi state that parental concern for the well-being of the child is necessary for properly rearing a child. Attachment of the parents to the child, which Hirschi (1969) earlier identified as a source of social control, is important because it makes the child more respectful or willing to listen to their parents. The connection between social control and self-control could not be more direct than that of parental supervision. Supervision of the child not only prevents them from engaging in criminal and analogous acts, but also works to train the child to avoid them on their own (Gottfredson & Hirschi, 2003). This assumption is consistent with evidence that supports the notion that supervision is a major predictor of delinquency in the sense that those poorly supervised when young tend to engage in crime when they are adults.

Supervision, however, is only effective if the parent can successfully recognize deviant behavior when it occurs. Surprisingly enough, not all parents possess the ability to recognize a lack of self-control and allow their children to get away with such behaviors as excessive television viewing, smoking, staying out past curfew, and hanging out with delinquent peers (Gottfredson & Hirschi, 2003). Not all parents or caregivers punish effectively. Some are too lenient and some are too harsh in their tactics. Coming from the perspective that criminal acts have their own rewards, Gottfredson and Hirschi (2003) state that it is not enough just to reward good behavior if the deviant behavior is not corrected.

Gottfredson and Hirschi focus on the presumption that the self-control of the parent is connected to the successive self-control of the child. One can conclude then, that parents with low self-control do not effectively manage their children. While not commenting on the genetic effect on criminality, Gottfredson and Hirschi (2003) do conclude that those that are socialized poorly themselves will lack the adequate skills to properly socialize their children (Gottfredson & Hirschi, 2003). Children whose parents have engaged in crime are vulnerable to crime, not

because they are more likely to engage in crime, but because they are less likely to avoid such behavior. The theory itself posits that crime is easy and that humans seek gratification. Therefore, parents with low self-control are less to expend any great effort to prevent their children from engaging in such behavior (Gottfredson & Hirschi, 2003).

Consequences of Low Self-Control. Individuals who possess the traits of low self-control are not likely to achieve long-term goals. In fact, they hinder educational and occupational goals, destroy interpersonal relationships that require delayed gratification, planning, and preferences for cognitive and verbal activities, and engage in conduct that is detrimental to their physical health and economic well-being (Evans et al., 1997). Therefore, those with low self-control have difficulty not only making but keeping friends, and are more likely to be attracted to individuals who possess low self-control themselves. These individuals are less likely to be able to successfully navigate the demands of the school environment, as well as be able to maintain any sort of stability within any occupational setting. If they do manage to acquire employment, it is not likely that it will be that of a white collar position. These individuals will be more likely to enter into marriages that have a high probability of failing and will be more comfortable in the "street" setting (Gottfredson & Hirschi, 1990).

General Strain Theory

Robert Agnew's (1992) general strain theory is currently a dominant and enduring theory in criminology. Building off the classic strain theorist Robert Merton, Agnew has revitalized and extended the classical strain paradigm.

Merton's Classic Strain Theory. In "Social Structure and Anomie," Robert Merton (1938) presented both a macro-level theory of anomie and an individual-level theory of strain.

At the macro-level, Merton argued that there were two co-existing structures in society: the cultural structure and the social structure. Within the cultural structure are the norms and goals in which people of a society subscribe to. Merton used the United States as an example to illustrate the idea that everyone has the goal of the desire to achieve the American Dream. Thus, the goal of achieving monetary success is ingrained in the culture. The norms, or what Merton called the culturally proscribed means to achieve the goals, are to work hard using legitimate outlets such as going to school and obtaining a degree and a stable occupation. In addition to the cultural structure, Merton (1938) recognized the social structure, which he argued is an individual's location in society. This place in society is what dictates the means one has available in order to achieve the culturally defined goals (monetary success).

According to Merton (1938), when the means one has available to them limits them from achieving the desired goal of monetary success, there is a disjuncture between the means and the goals. This disjunction places a strain on the institutionalized norms and as a result a state of anomie transpires. When this state of anomie ensues, norms become weakened and people are then free to use the most efficient means necessary in order to achieve their goals. As a result, crime is one route people may resort to in order to achieve the goal of monetary success.

In "Social Structure and Anomie," Merton (1938) also developed an individual-level strain theory. Merton argued that the disjuncture between the goals and the means can also place a strain on the individual. When this strain develops, the individual will then feel the pressure to adapt to that strain. Merton laid out five clear mechanisms an individual will use to adapt to strain. The first one, conformity, is the most common. Although the individual is strained, he or she still accept both the culturally proscribed means and goals to achieving monetary success. The second adaptation is innovation, which occurs when the individual rejects the means but still

accepts the goals of society. Thus, the individual still wants and strives for the monetary goal, but may engage in crime to achieve that goal. The third adaptation is ritualism, which is when the individual accepts the means but rejects the goals of society. This individual no longer strives to acquire monetary success but still buys into the means of society. The fourth adaptation Merton described is retreatism, which occurs when the individual rejects both the goals and means of society. This individual is likely to fall out of society and become addicted to drugs and alcohol. Finally, the last adaptation is rebellion, which occurs when the individual rejects both the means and the goals and replaces them with their own.

Agnew's Revised Strain Theory. Agnew (1985) extended Merton's classic strain theory by asserting that there was more than one type of strain. While Merton (1938) focused mainly on the gap between the expectations and aspirations of people in society, Agnew (1985) introduced a new type of strain that individuals may experience when in aversive situations. In his revised strain theory, Agnew (1985) argued that this type of strain could push individuals to engage in criminal behavior. He contended that individuals, particularly juveniles, are often placed in aversive situations and cannot escape. In response, the juvenile will often experience a blockage of pain avoidance behavior that will result in strain. Juveniles may not legally be able to escape overly punitive parents or an aversive school environment, which may lead to strain, and in turn will create pressure to alleviate that strain. The juvenile then may choose to engage in criminal behavior as a way to lessen the strain they are experiencing.

Agnew's General Strain Theory. Building upon his 1985 work and the work of Merton (1938) Agnew introduced his general strain theory in 1992. In this theory, Agnew presents new types of strain, a theory of intervening variables, coping mechanisms, and the role of negative affective states. Like Robert Merton (1938), Agnew proposed that the failure to achieve

positively valued goals is a type of strain, but extended it by asserting that there are three specific ways to fail to achieve positively valued goals. The gap between aspirations and expectations is, in essence, the strain that was discussed in Merton's (1938) classic strain theory. This type of strain occurs when an individual has a desire or aspiration but does not have the means to achieve it. The gap between expectations and actual outcomes occurs when an individual truly believes that he or she will achieve a particular outcome but does not. Agnew (2006) argues that this strain may be even more aversive than the gap between aspirations and expectations because aspirations are idealized goals, whereas the actual outcomes and expectations are based in reality. The gap between just/fair outcomes and actual outcomes examines the role of equity and justice. Although individuals may realize that their expectations and aspirations may not always be congruent, they will still have a reasonable expectation that the outcome will be fair and equal among everyone. These individual will experience strain when they begin to feel as though they are being treated unfairly.

The second type of strain that was proposed by Agnew (1992) is the removal of positively valued stimuli. This may occur when an individual has something they value and desire and the stimulus is taken away from him or her. The loss of something or someone that an individual values will create a negative affective state, which in turn creates pressure to alleviate that strain.

The third and last type of strain put forward by Agnew (1992) is the presentation of negative or noxious stimuli. This occurs when an individual is presented with a noxious or aversive stimulus. This is similar to Agnew's (1985) blockage of pain-avoidance behavior where he explained how youths who were presented with a negative stimulus (an aversive school, or punitive parents), would be presented with high amounts of strain.

Types of Strain Conducive to Crime. Although the development of new types of strain

in general strain theory can be seen as Agnew's (1992) greatest contribution, critics have been

quick to point out that it may have also been his biggest weakness (Agnew, 2001). Recognizing

that there are many different types of strain that an individual can be confronted with, Agnew

(2001) specified four types of strain that he claimed were the most conducive to criminal

behavior. These four types are: (1) strain that is unjust, (2) strain that is high in magnitude, (3)

strain that is associated with low social control and, (4) strain that creates a pressure or incentive

to engage in criminal behavior.

When a strain is seen as unjust or unwarranted it is very likely that the individual will

experience the negative affective state of anger. When strain leads to a state of anger, there is a

high possibility for criminal behavior (Agnew, 2001). Strain that is high in magnitude is very

difficult for an individual to cope with. It is often long in duration, frequent, very recent, and

attacks the core values of the individual. Thus, this often taxes the coping ability of the

individual and makes it more difficult for them to effectively cope in a non-criminal manner.

When strain is associated with low social control, it is likely to lead to criminal behavior. For

example, one source of strain for a child could be that of parental rejection. If a child is rejected,

he or she is no longer under the direct control of his or her parents and will be free to deviate.

Finally, strain that creates a pressure or incentive to engage in deviant behavior is also likely to

lead to criminal behavior.

Theory of Intervening Variables. In Agnew's (1992) general strain theory he proposed a

theory of intervening variables. Many of Agnew's intervening variables consist of the same

constructs developed in other theories of crime. Agnew argued that whether or not strain leads

to a criminal response depended on both the presentation of the strain and how and individual was able to cope or deal with the strain.

In his general theory, Agnew (1992) presents a variety of intervening variables that make criminal behavior less likely in response to experiencing strain. Agnew argued that if an individual had other goals available to them, then the strain would be less likely to lead to criminal behavior. Agnew further argued that criminal behavior was less likely to occur if the individual had adequate coping skills. Agnew (2006) stresses three particular effective coping mechanisms. First, there is behavioral coping that entails dealing with directly with the strain itself. Second, he discussed cognitive coping that occurs when an individual cognitively reinterprets the strain by minimizing it, maximizing it, focusing on the positive or accepting responsibility. Finally, there are emotional coping attempts to directly deal with the negative affective state caused by the strain. According to Agnew (2006), if an individual possesses pro-social behavioral, cognitive, and emotional coping skills, he or she is less likely to engage in criminal behavior.

Other intervening variables that can potentially increase the likelihood of criminal behavior are the denial of access to illegitimate opportunities (Cloward, 1959; Cloward and Ohlin, 1960), having social support (Cullen, 1994), or having social control or social bonds (Hirschi, 1969). All of these factors inhibit a criminal response to strain.

Agnew (2006) also presented intervening variables that make a criminal response more likely to occur. For example, if an individual had prior learning experiences that reinforced antisocial behavior, he or she is more likely to engage in criminal behavior as a response to strain (Akers, 1977). If individuals have pro-criminal beliefs (Sutherland, 1937), if they have hostile attribution bias or can justify their behavior (Sykes & Matza, 1957), or if they have a criminal

temperament (Gottfredson & Hirschi, 1990), they are more likely to engage in criminal behavior as a response to strain.

Role of Anger. Agnew (1992) argued that anger played a significant role in how an individual reacts to strain. According to Agnew, strain creates a pressure to alleviate a negative affective state. Crime is one way to alleviate this through lowering the strain, getting rid of the negative affective state or allowing for revenge (Agnew, 2006). Although strain can cause a variety of affective states (frustration, anger, depression, anxiety), the major focus of Agnew's general strain theory is anger. Anger, Agnew (2006) argues, is more likely to cloud an individual's judgment, which may instigate some kind of action without the individual thinking about the consequences of those actions. This role of anger is particularly important when discussing gender differences. Agnew (2006) proposed that girls do not experience less strain; rather they experience different types of strain and it results in a negative affective state of anger rather than depression.

RIVAL THEORIES AND ADOLESCENT SUBSTANCE USE:
PAST EMPIRICAL TESTS

The section below is a review of the empirical literature in which the theories explained above have been used to explain substance use. Each table in this section provides a comprehensive view of how each theory was utilized across diverse samples and with diverse measures to explain substance use among adolescents. The tables describe and summarize the measures used for each theory, whether multiple theories were used in study, how the dependent variables were measured, and whether the study found support or partial support for the theory.

Table 1.1 provides a summary of studies that have assessed whether differential association theory is to account for involvement in drug use and alcohol use. In all, 18 studies

are included in Table 1.1. These studies span a 30 year period and have been conducted on diverse samples and with diverse measures. As can be seen, the existing empirical literature provides consistent support for differential association theory.

Thus, of the 18 studies in table 1.1, the results of 10 show clear support for differential association theory. In the remaining 8 studies, the analyses revealed at least partial support for the theory. Studies are categorized as showing partial support if at least one, but not all, of the components of differential association were significantly related to the dependent variable. It is instructive that none of the studies reviewed reported null findings or reported that measures of differential association were inversely related to drug or alcohol use.

Table 1.2 provides a summary of studies that have specifically assessed the impact of peers on drug use and alcohol use. Although, peer influence and delinquent peers are a common measure of just differential association and social learning theory, the measure was included in a large number of studies that were not just testing those specific theories. The inclusion of this measure across all studies simply highlights the importance of including this particular construct when studying the causes of adolescent substance use. In all, 21 studies are included in Table 1.2. These studies span over three decades and have been conducted on diverse samples and with diverse measures. As can be seen, the existing empirical literature provides consistent support for the effect of peers on substance use. Thus, of the 21 studies in Table 1.2, the results of 17 show clear support for the effects of peers on the dependent variable. In the remaining two studies, the analyses revealed at least partial support.

Table 1.1 *Empirical Studies of Differential Association/ Social Learning Theory*

	Categories						
Author/Year	Sample	Theoretical Variables	Multiple Theories	DV: Drugs	DV: Alcohol	Support: Yes/No	Support: Partial
Akers et al. (1979)	N= 3,065 Three Midwest States	Imitation differential assoc./ diff reinforce definitions	No	6 point frequency scale of marijuana use	No	Yes	
Krohn et al. (1985)	N= 1,068 1980-82 junior high students	Imitation differential assoc./ diff reinforce definitions	No	Self-Report frequency of smoking	No		Yes
Tittle et al. (1986)	N=1,993 Iowa, New Jersey, Oregon	Guttman Scale— association Tolerance scale	No	Frequency of marijuana use	No		Yes— Indirect support
Johnson & Marcos (1988)	N= 596 in Arizona N= 6,297 in Utah	Parental, education, and religious attachment conven. values drug using friends	Yes— Social Bonds	Frequency of use	Frequency of use	Yes	
Agnew & White (1992)	HHDP N=1,380	20-item scale of delinquent friends	Yes— Social-Control, General Strain Theory	Self-Report measure of drug use	No	Yes— Interaction effect btwn strain and crime	

Akers & Gang (1996)	N=454 7th-12th graders in Iowa	differential peer association parents' definitions friends' definitions	No	Frequency of cigarette smoking	No	Yes	
Winfree & Bernat (1998)	GREAT program—Phoenix, Ariz, Las Cruces, NM	NYS, Denver Youth Survey	Yes—Self-Control	Elliott & Ageton's Scale (1985)	Elliott and Ageton's Scale (1985)		Yes
Akers & Gang (1999)	Boys Town Study N=3,065	differential peer association definitions differential reinforce of use	Yes—Social Bonds	Marijuana use	No	Yes	
Alarid et al. (2000)	N=1,153 court-ordered boot camp Texas	Ind. def. towards crime Others' def. towards crime criminal friends	Yes—Social-Control	Elliott & Ageton's Scale (1980)	No		Yes
Mazerolle et al. (2000)	N=263	Close delinquent family and friends	Yes—Social Control	NYS-frequency of use	NYS-frequency of use	Yes—Mediating effect btwn strain and crime	
Gang et al. (2004)	Boys Town Study N=3,065	differential peer association imitation differential reinforce	No	Frequency of use	Frequency of use	Yes	

Monroe (2004)	NCHS N=3,460	differential reinforce differential association definitions	No	frequency of cigarette smoking	No	Yes	
Maume et al. (2005)	NYS N=593	Change in delinquent peer exposure	Yes— Social Control	Desistance from marijuana use	No		Yes
Rebellon (2006)	1st and 3rd waves of NYS	Time socializing importance of socializing	No	No	Number of times drunk	Yes	
Neff & Waite (2007)	Youth Profile Database N= 5,422	APSI— peer influences	Yes— General Strain Theory	APSI— Peer substance use index	APSI— Peer substance use index		Yes
Cullen et al. (2008)	N=2472 Virginia	Five-item measure of aggressive attitudes	Yes— Social Bonds, Self-Control, General Strain	Two-item scale on illegal substance abuse	Two-item scale on use of alcoholic beverages	Yes	
Cooper et al. (2009)	N=808 juveniles in prison in Indiana	Six-item scale assessing pro-social attitudes of peers	Yes— Social-Control, General Strain Theory	Substance use attitudes— PDU attitudinal scale, soft/hard drug use	Alcohol-seeking and use scale		Yes
Brauer (2009)	NYS N=1,725	Parents/ peers approve/ disapprove of marijuana use	No	Use of marijuana	No		Yes

Table 1.2 *Delinquent Peers*

Author/Year	Measure for Peers	Theory Studied	DV: Drugs	DV: Alcohol	Support: Yes/No	Support: Partial
			Categories			
Akers et al. (1979)	Diff. peer assoc.	Social Learning	Six-item frequency of use scale— marijuana	No	Yes	
Thompson et al. (1982)	Peer group influence	Social Bond, Self-Control	Frequency of use	Frequency of use	Yes	
Krohn et al. (1985)	Friends' definition scale, friends' imitation scale	Social Learning	Self-report frequency of smoking	No		Yes
Akers & Gang (1996)	Scale of diff. peer assoc.	Social Learning	Frequency of smoking	No	Yes	
Johnson & Marcos (1988)	Drug using friends	Social Bond	Frequency of use	Frequency of use	Yes	
Agnew & White (1992)	delinquent peers	General Strain, Social Learning, Self-Control	Self-report use	No	Yes	
Akers & Gang (1999)	Diff peer assoc., peer definitions	Social Learning, Social Bond	Marijuana use	No	Yes	

Gang et al. (2000)	Diff. peer assoc.	Social Learning	Frequency of use	Frequency of use	Yes
Mazerolle et al. (2000)	Close delinquent friends	General Strain, Social Learning	NYS-Frequency of use	NYS-Frequency of use	Yes—strain conditioned by peers
Aseltine et al. (2000)	Exposure to delinquent peers	General Strain	No	Drunk Driving	No
Alarid et al. (2000)	Criminal friends	Social Learning	Elliott & Ageton's Scale of Delinquent Behaviors	Elliott & Ageton's Scale of Delinquent Behaviors	Yes
Perrone et al. (2004)	Four-item measure of deviant peers	Self-Control	Six-item delinquent scale	Six-item delinquent scale	Yes
Monroe (2004)	Diff. assoc., reinforce, definitions Imitation	Social Learning	Frequency of smoking	No	Yes
Robbers (2004)	delinquent peers	General Strain	Self-report use	No	Yes
Maume et al. (2005)	Exposure to delinquent friends, time spent with friends	Self-Control	Marijuana use	No	No
Rebellon (2006)	delinquent peers, attitudes of peers	Social Learning	No	Use of alcohol	Yes

Costello et al. (2006)	delinquent peers	Self-Control	No	Heavy episodic drinking	Yes	
Neff & Waite (2007)	Peers' use of drugs and alcohol	Social Learning, General Strain	APSI—Peer substance use index	APSI—Peer substance use index	Yes	
Cooper et al. (2009)	Six-item scale of attitudes of peers	Social Learning, Self-Control, General Strain	Substance use attitudes—PDU attitudinal scale, soft/hard drug use	Alcohol-seeking and use scale	Yes	
Brauer (2009)	Peer influence	Social Learning	Marijuana use	No		Yes
Baker (2010)	delinquent peers	Self-Control, Social Bond	No	Problematic drinking	Yes	

Table 1.3 *Empirical Studies of Social Bond Theory*

Author/Year	Sample	Theoretical Variables	Multiple Theories	DV: Drugs	DV: Alcohol	Support: Yes/No	Support: Partial
				Categories			
Krohn & Massey (1980)	N=3,065 7th-12th graders in Midwest	attachment commit., belief	No	Frequency of use	Frequency of use	Yes	
Johnson & Marcos (1988)	N= 596 in Arizona N=6,297 in Utah	Parental, education, and religious attachment	Yes— Social Learning	Frequency of use	Frequency of use	Yes	
Agnew & White (1992)	HHDP N=1,380	Parental, school, peer attachment parental permissive edu goals	Yes— Social Learning, General Strain Theory	Self-report measure of drug use	No		Yes
Akers & Gang (1999)	N=3,065 Boys Town Survey	attachment commit belief	Yes— Social Learning	Marijuana use	No		Yes
Mazerolle et al. (2000)	N=263	attachment commit beliefs	Yes— Social Learning, General Strain	NYS- frequency of use	NYS- frequency of use	Yes— Mediating factor btwn strain and crime	
Maume et al. (2005)	N=593 NYS	Marital attachment	Yes— Social Learning	Desistance from marijuana use	No	Yes	

| Cooper et al. (2009) | N=808 juveniles in prison in Indiana | School attachment index | Yes—General Strain, Social Learning | Substance use attitudes—PDU attitudinal scale, soft/hard drug use | Alcohol-seeking and use scale | | Yes |
| Carson et al. (2009) | N=3,161 Kilpatrick & Saunders (1995) | Problems w/ family and friends | Yes—General Strain | Frequency of use | No | Yes—Mediating factor btwn strain and crime | |

Table 1.4 *Empirical Studies of Self-Control*

Author/Year	Sample	Theoretical Variables	Multiple Theories	DV: Drugs	DV: Alcohol	Support Yes/No	Support Partial
				Categories			
Winfree & Bernat (1999)	GREAT program	NYS, Denver Youth Survey	Yes— Social Learning	Elliott and Ageton's Scale (1985)	Elliott and Ageton's Scale (1985)		Yes
LaGrange & Silverman (1999)	N=2,095	Subscale of the Basic Personality Inventory	No	20-item scale on frequency of use	20-item scale on frequency of use	Yes	
Perrone et al. (2004)	ADD Health N=15,243	Attitudinal behavioral measures, parental efficacy	No	Six-item delinquent scale	Six-item delinquent scale	Yes	
Tittle et al. (2003)	N=350 OKC survey	Grasmick et al. scale (1993)	No	No	The general scale of crime/ deviance		Yes
Baron (2003)	N=470	Grasmick et al. Scale (1993) 23-item	No	Self-report use	Self-report use	Yes	

51

Table 1.5 *Empirical Studies of Social Bond and Self-Control Theories*

			Categories				
Author/Year	Sample	Theoretical Variables	Multiple Theories	DV: Drugs	DV: Alcohol	Support Yes/No	Support Partial
Thompson et al. (1982)	N=2,353	39 ?'s attitudinal attachment involve commit belief	No	Patterns of use	Patterns of use	Yes	
Alarid et al. (2000)	N=1,153 court-ordered boot camp Texas	Marital, parent, friends, involve, belief	Yes—Social Learning	Elliott & Agetons's Scale of delinquent behaviors	No		Yes
Costello et al. (2006)	N=1,136 9th-11th graders in Ark	attachment to parents, commit, belief, self-control	No	No	Heavy episodic drinking	Yes	
Cullen et al. (2008)	N=2,472 Virginia	Parental social bonds, commit, Grasmick et al. Scale (1993) 23 items	Yes—Social Learning, General Strain	Two-item scale on illegal substance abuse	Two-item scale on illegal substance abuse	Yes	
Booth et al. (2008)	Patriot High's Youth Risky Bhv Survey N=1,366	attachment involve, school climate, comm. disorder	No	Additive scale, frequency of use	Additive scale, frequency of use		Yes
Baker (2010)	N=4,834	peers	No	No	Drinking	Yes	

Table 1.6 *Empirical Studies of General Strain Theory*

Author/Year	Sample	Theoretical Variables	Multiple Theories	DV: Drugs	DV: Alcohol	Support Yes/No	Support Partial
			Categories				
Agnew & White (1992)	HHDP N=1380	Negative life events life hassles neg. rel w/ adults, neighbors work, clothing strain	Yes— Self-control, Social Learning	Self-report use of drugs	No	Yes	
Mazerolle et al. (2000)	N=291	Removal of positive stimuli, parental hostility	Yes— Self-Control, Social Learning	NYS-frequency of use	NYS-frequency of use	Yes	Yes—Strain mediates anger
Aseltine et al. (2000)	N=1208	Life stresses, family peer conflict, anger, anxiety	No	No	Driving while impaired	Yes	Yes—Anger & anxiety
Robbers (2004)	NYS—6th wave	Failure to achieve goals, personal life changes, abuse, victim	Yes— social support	Yes—Self-report use	No	Yes	Yes—Social support a mediating effect on general strain
Neff & Waite (2007)	Youth Profile Database N= 5,422	APSI-family/ living situations, victimized,	Yes— Social learning	APSI— Peer substance use index	APSI— Peer substance use index		Yes

Lo et al. (2008)	NYS N=1725	Coping Method—victim	No	Frequency marijuana & poly-drug use	No	Yes	
Cullen et al. (2008)	N=2472 Virginia	5-item self-report scale on coercive parenting	Yes—Social Bonds, Self-Control, Social Learning	Two-item scale on illegal substance abuse	Two-item scale on illegal substance abuse	Yes	
Cooper et al. (2009)	N=808 juveniles in prison in Indiana	5-item scale on access to legitimate opp.	Yes—Self-Control, Social Bonds	Substance use attitudes—PDU attitudinal scale, soft/hard drug use	Alcohol-seeking and use scale		Yes
Carson et al. (2009)	N=3161 Kilpatrick & Saunders (1995)	Measures of early victim, negative emotions	Yes—Social Bonds	Frequency of use	No	Yes	Yes—Negative Emotions mediated strain
De Coster & Zito (2010)	N=385	Life Events Checklist, Adolescent Perceived Events Scale (Compass et al. 1987)	No	Frequency of Use	No	Yes	

Studies were categorized as showing partial support if at least one, but not all, of the components of delinquent peers were significantly related to the dependent variable. Only two of the studies found no support for this measure, however, none of the studies reported that the measure of delinquent peers was inversely related to drug or alcohol use.

Table 1.3 provides a summary of studies that have assessed whether social bond theory is able to account for involvement of drug and alcohol use.   In all, nine studies are included in Table 1.3. These studies span a period of almost three decades and have been conducted on various samples and with diverse measures. It is evident from Table 1.3 that the existing literature provides consistent support for social bond theory.

Thus, of the nine studies in Table 1.3, the results of five reveal clear support for social bond theory. In the remaining four studies, the analyses revealed at least partial support for the theory. Studies are categorized as showing partial support if at least one, but not all, of the components of social bond were significantly related to the dependent variable. It is important to note that none of the studies reviewed reported null findings or reported that measures of social bond were inversely related to drug or alcohol use.

 Table 1.4 provides a summary of studies that have assessed whether self-control theory is able explain involvement in drug and alcohol use. In all, 5 studies are included in Table 1.4. These studies cover a period of close to eight years and have been conducted across multiple samples and with multiple measures. Given the evidence from Table 1.4, it is clear that the existing empirical literature provides consistent support for self-control theory.

Thus, of the five studies in Table 1.4, the results of three show distinct support for self-control. In the remaining two studies, the analyses revealed at least partial support for the theory. Studies are categorized as showing partial support if at least one, but not all, of the

components of self-control were significantly related to the dependent variable. It is instructive that none of the studies reviewed showed null findings or reported that measures of self-control were inversely related to drug or alcohol use.

Table 1.5 provides a summary of studies that have evaluated whether both social bond and self-control theories are able to account for participation in drug use and alcohol use. In all, six studies were studied in Table 1.6, with the earliest being in 1982 and the most recent in 2010. It is evident that the existing empirical literature provides consistent support for those studies that include measures for both social bond and self-control theories.

Of the six studies in Table 1.5, the results of four show clear support for social bond and self-control theories. In the remaining two studies the analyses revealed at least partial support for the theories. Studies are categorized as showing partial support if at least one, but not all, of the components of social bond and self-control were significantly related to the dependent variable. It is important to note that a null finding was not found among any of the studies; nor were there any reports of an inverse relationship between substance use and the theories.

Table 1.6 provides a summary of studies that have assessed whether general strain theory is able to account for the participation in drug and alcohol use. In all, ten studies are included in Table 1.6 and cover a span of twenty years. Each study has been conducted on diverse samples and with diverse measures. As can be seen, the existing empirical literature provides consistent support for general strain theory.

Thus, of the ten studies in Table 1.6, the results of eight show clear support for general strain theory. In the remaining two studies, the analyses revealed at least partial support for the theory. In four of the eight studies that indicated clear support for the theory, the analyses also revealed partial support for the particular measures of anger and negative emotion, both of which

are central to general strain theory. Studies are categorized as showing partial support if at least

one, but not all, of the components of general strain were significantly related to the dependent

variable. It is instructive that none of the studies reviewed reported null findings or reported

measures of general strain theory that were inversely related to drug use and alcohol use.

THE ISSUE OF GENDER:
ARE EXPLANATIONS SPECIFIC OR GENERAL

The section below examines the issue of gender-specificity and how this has been explored

in the previous empirical literature in the area of substance use. Each table in this section

provides a comprehensive view of gender-specific studies among different theories. These

studies were conducted across diverse samples with diverse measures to try and explain the

gender differences in adolescent drug and alcohol use. Table 1.7 describes and summarizes the

measures used for each theory, whether multiple theories were used in study, how the dependent

variables were measured, and whether the study found partial or full support among males and

females.

Of the ten studies shown below, four show clear support for both males and females

within the particular theory being studied. This means that on a particular measure for the theory

there were no gender differences in explaining adolescent substance use and alcohol use. For

example, Robbers (2004) found no gender differences between males and females in explaining

the effect of delinquent peers on substance abuse.

In the remaining studies the analyses revealed at least partial support for eight of the

studies. Studies are categorized as showing partial support if at least one, but not all, of the

components of the particular theory being studied were significantly related to the dependent

variable. Partial or full support for males or females indicates that there are differences in how

the theory predicts substance and alcohol use among each gender. For example, La Grange and Silverman (1999) found partial support for both males and females; however, the support for each gender was on different measures within the theory. Alarid et al. (2000) found full support among males for social learning theory, and only partial support for females among the same measures, indicating there is a difference in how social learning predicts substance use among males and females.

RESEARCH STRATEGY

The overall purpose of this dissertation is to examine the relative ability of social learning theory, social bond theory, self-control theory, and general strain theory to explain adolescent substance use. To investigate this issue, the current project will draw on data, including theoretical measures, from all four waves of the Rural Substance Abuse and Violence Project (RSVP) conducted in the state of Kentucky from the spring of 2001 to the spring of 2004. This prospective longitudinal study focused on youths from seventh to eleventh grade in 111 schools throughout the state. From these data, the measures for drug and alcohol use will be constructed, along with measures for each specific rival theory.   Evidence from previous research suggest that social learning theory, social bond theory, self-control theory, and general strain theory should all have explanatory power in predicting adolescent substance use in this particular study. Accordingly, it is possible to state the following hypotheses:

1. Youth who have been exposed to delinquent learning are more likely to engage in substance and alcohol use.

Table 1.7 *Empirical Studies of Theories by Gender*

Author/Year	Sample	Theoretical Variables	Theories Studied	DV: Drugs/ Alcohol	Male Support: Yes/No/ Partial	Female Support: Yes/No/ Partial	Both Supported: No Difference
Krohn & Massey (1980)	N=3,065 7th-12th graders in Midwest	attachment commit., belief	Self-Control	Frequency of use	Partial— Self-Control	Partia— Self-Control	
Johnson & Marcos (1988)	N= 596 in Arizona N= 6,297 in Utah	Parental, education, and religious attachment conven. values drug using friends	Social Learning Social Bond	Frequency of use			Yes—Social Learning, Social Bond
LaGrange & Silverman (1999)	N=2,095	Subscale of the Basic Personality Inventory	Self-Control	20-item scale on frequency of use	Yes— Self-Control	Yes— Self-Control	
Alarid et al. (2000)	N=1,153 court-ordered boot camp Texas	Ind. def. crime Others' def. crime criminal friends Marital, parent, friends, involve,	Social Learning, Self-Control	Elliott & Agetons's Scale of delinquent behaviors-drug use	Partial— Self-Control Yes— Social Learning	Partial— Self-Control, Social Learning	
Tittle et al. (2003)	N=350 OKC survey	Grasmick et al. scale (1993)	Self-Control	The general scale of crime-Alcohol	Partial— Self-Control	Partial— Self-Control	

Robbers (2004)	NYS—6th wave	Failure to achieve goals, personal life changes, abuse, victim	General Strain	Self-Report use of drugs	Partial—General Strain	Partial—General Strain	Yes—Delinquent Peers
Neff & Waite (2007)	Youth Profile Database N= 5,422	APSI—peer influences family/living situations, victimized	General Strain, Social Learning	APSI—Peer substance use index	Partial—General Strain	Partial—General Strain	Yes—Social Learning
Booth et al. (2008)	Patriot High's Youth Risky Bhv Survey N=1,366	attachment involve, school climate, comm. Disorder	Self-Control	Additive scale, frequency of use	Partial—Self-Control	Partial—Self-Control	
Cullen et al. (2008)	N=2,472 Virginia	Grasmick et al. Scale (1993) 5-item self-report scale on coercive parenting, attachment commit belief	Social Learning, Social Bond, Self-Control, General Strain	Two-item scale on illegal substance abuse			Yes—General Strain
De Coster & Zito (2010)	N=385	Life Events Checklist, Adolescent Perceived Events Scale	General Strain	Frequency of drug use	Yes—General Strain	Yes—General Strain	

1.1 Youths who have contact with delinquent friends are more likely to engage in substance and alcohol use.

2. Youths with weak social bonds are more likely to engage in substance and alcohol use.

2. Youths with low self-control are more likely to engage in substance and alcohol use.

3. Youths who experience higher strain are more likely to engage in substance and alcohol use.

Research on the explanatory power of social learning, social bond, self-control and general strain across gender groups is less plentiful and does not provide clear evidence of the generality of the effects of specific theoretical components. Phrased differently, more research needs to be undertaken on the extent to which each theory and its components have general or gender-specific effects. Accordingly, it is appropriate to state not a research hypothesis but a research question: Are the effects of the theoretical measures on alcohol and drug use gender specific or general?

Chapter 2

METHODS

The purpose of the current study is to increase the understanding of what influences the degree to which youths are involved in substance abuse. This chapter begins with a description of the sample obtained from of a large data set that examined youths in Kentucky schools. The next section outlines the theoretical measures drawn from the survey instrument, which was constructed to assess the experiences of the youths both inside and outside of school. This section is followed by a description of the dependent variables, which cover alcohol, tobacco and drug use. The last section of this chapter discusses the control variables for the current study.

SAMPLE

The Data

The data used for this study come from the Rural Substance abuse and Violence Project (RSVP). The data was collected as part of a prospective longitudinal study conducted between the spring of 2001 and the spring of 2004 in the state of Kentucky. The current study will be utilizing all four waves of data, which consists of self-report surveys of a panel of students who were enrolled in seventh grade during the 2000-2001 academic year (Wilcox, Tillyer, & Fisher, 2009).

Participants of the student section of RSVP were selected through a multi-stage process. From a stratified sampling of Kentucky's 120 counties, 30 were selected for data collection. Within the 30 counties, 65 of 74 public schools comprising seventh graders agreed to participate in the study. A total of 9,488 seventh graders were marked for inclusion in the sample. Active

consent was granted by the parents of 43 percent of the targeted population. Of the 43 percent of children who were given permission to participate in the survey, 90 percent did, leaving a total of 3,692 students in wave one, 3,638 students in wave two, 3,050 students in wave three, and 3,040 students in wave four. Overall, the response rate was generally consistent with other studies of students that utilized active parental consent, producing rates from 35 percent to 60 percent (Wilcox et al., 2009).

Sample Characteristics

The data of the 65 schools who participated in the study were compared to the Kentucky Department of Education (KDE) enrollment data for the same 65 schools. The racial composition of the sample was fairly close to the KDE data. Explicitly, in wave 1, the sample percentage of non-white was 9.5 percent compared to the KDE data which showed 10.8 percent (this data included all students in the selected schools, not just seventh-graders). The sample did, however, appear to underrepresent males with close to 45.9 percent of wave 4 respondents being male compared the KDE's number of 51.9 percent being male (Wilcox et al., 2009).

The sample was 90.9 percent White and 45.9 percent male at wave 4, indicating that the sample attrition that occurred across waves was not systematically related to race and gender. When both race and gender were combined, the sample as wave 1 has the following characteristics: 4.8 percent non-White male, 5.0 percent non-White female, 42.7 percent White male and 47.5 percent White female. By wave 4 the race and gender alignment was 4.3 percent non-White male, 4.3 percent non-White female, 42.2 percent White male, and 49.2 percent White female (Wilcox et al., 2009).

MEASURES OF THEORETICAL VARIABLES

The section below will outline the measures to be used in this dissertation. The current study will review measures for social learning theory, social bond theory, self-control theory, and general strain theory. Using previous studies as a guide, the section below will incorporate the measures that are necessary to successfully utilize social learning theory, social bond theory, self-control theory, and general strain theory to predict adolescent alcohol and substance use.

Social Learning Theory Measures

This study has incorporated five measures that are consistent with that of past measures of social learning theory. First, as seen in Table 1.2, one of the most frequently used measures of social learning is the number of delinquent peers that a youth has. This measure is thought to assess the extent to which youths differentially associate with criminal versus non-criminal others. In the current study, the respondents were instructed to assess the types of behavior their closest friends had engaged in over the last school year. They were presented with the following items:

1. Smoked cigarettes daily for one week or more

2. Used smokeless tobacco daily for one week or more

3. Gotten drunk

4. Smoked marijuana

5. Used inhalants (huffing)

6. Used cocaine/crack

7. Used speed

8. Used crystal meth

64

9. Taken ecstasy

10. Taken OxyContin

11. Taken other pills

12. Driven after drinking

For each item, the respondents were asked to use a five-point Likert scale to express how much of the substance was engaged in. The five response categories were 1 = none, 2 = very few, 3 = some, 4 = most, 5 = all. The Cronbach's alpha for this scale was .836. Finally, this variable is labeled *delinquent peers.*

The second measure that has often been used in previous studies, as seen in Table 1.1, is that of close family and friends engaging in delinquent or deviant behavior. The respondents were asked about their family and friends' use of tobacco by responding to the following items:

1. My father smokes or uses spit tobacco

2. My mother smokes or uses spit tobacco

For each item, the respondents were asked to use a two-item scale to indicate the use of tobacco by those around them. The response categories for these items was a two-item scales ranging from 0 = no, 1 = yes. A dummy variable was created for this measure and labeled *family use of tobacco*.

The respondents of the study were then asked to respond to the following items regarding the use of tobacco at school.   The respondents were presented with the following items:

1. The students in my school are allowed to smoke or dip in certain areas.

2. The teachers in my school are allowed to smoke or dip in certain areas.

For each item, the respondents were asked to use a two-item scale to indicate the use of tobacco while at school. The response categories for these items was a two-item scales ranging from 0 =

false, 1 = true. A dummy variable was created for this measure and labeled *use of tobacco at school.*

The respondents were then asked whether or not they felt that engaging in criminal behavior such as alcohol and drug use was wrong, which is an indicator of the individual's pro-social beliefs. This measure corresponds with previously used measures of individual beliefs towards crime as evident in Table 1.1. The respondents were asked how wrong it is for someone their age to:

1. Use alcohol

2. Use hard drugs such as heroin, cocaine, LSD

3. Use marijuana

Using a four-item scale, the respondents were asked to express their beliefs on the use of drugs and alcohol. The response categories for this variable ranged from 1 = not wrong at all, 2 = not very wrong, 3 = somewhat wrong, 4 = very wrong. The Cronbach's alpha for this scale is .852. Lastly, this variable is labeled *pro-social beliefs.*

As evident in Table 1.1, previous studies have also indicated that anti-social beliefs or definitions of crime are an essential measure for social learning theory. In the current study, the respondents were asked to respond to the following items:

1. It's okay to break the law if you can get away with it**.**

2. To get ahead, sometimes you have to do things that seem wrong.

3. Most things that adults call "crime" don't really hurt anyone.

4. It's okay to break the law if nobody is hurt by it.

5. In order to gain respect from your friends, it is sometimes necessary to beat up on other kids.

6. It's alright to beat up another person if he/she called you a dirty name.

7. It's alright to beat up another person if he/she started the fight.

8. Hitting another person is an acceptable way to get him/her to do what you want

For each item, the respondents were instructed to use a four-point Likert scale to express their beliefs on criminal behavior. The four response categories were 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. The Cronbach's alpha for this scale is .868. And lastly, this variable is labeled *anti-social beliefs*.

Social Bond Measures

The current study has utilized measures that are consistent with past measures of social bond theory. As seen in Table 1.3, one of the most commonly used measures of social bond theory is that of a youth's attachment to his or her parents. One of Hirschi's central propositions is that the social bond of attachment is inversely related to delinquent involvement. In this regard, the respondents for this study were asked to respond to the following items:

1. My mother/father seems to understand me.

2. My mother/father makes rules that seem fair to me.

3. My mother/father is concerned with how I am doing in school.

4. My mother/father helps me with my homework.

5. My mother/father talks to me about my report card.

6. My mother/father makes me feel wanted.

7. I share my thoughts and feelings with my mother/father.

8. I talk to my mother/father.

9. I do things with my mother/father.

For each item, the respondents were asked to use a five-point Likert scale to express the strength of their attachment to their parents. The five response categories were 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always. The Cronbach's alpha for this scale was .913. Finally, this variable is labeled *attachment to parents.*

Second, although not used by Hirschi (1969), control theorists have examined the potential impact on delinquency of parents' direct control of children (Nye, 1958; Wells and Rankin, 1990). Direct control occurs when the parent is physically present to supervise the child and, when necessary, to correct or punish misbehavior (Gottfredson & Hirschi, 1990). In this context, the three items below were used to gauge the level of direct supervision over the respondents.

1. My mother/father knows where I am when I am away from home.

2. My mother/father knows who I am with when I am away from home.

3. My mother/father sets a time for me to be home at night.

For each item, the respondents were asked to use a five-point Likert scale to express the level of direct supervision by their parents. The five response categories were 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always. The Cronbach's alpha for this scale was .813. Lastly, this variable is labeled *direct supervision.*

Third, the respondents were also presented with items that assessed their attachment to peers. As seen in Table 1.3, this form of attachment is commonly used in empirical tests of social bond theory. Similar to parental attachment, this measure is seen as having an inverse relationship with deviant behavior. The respondents were asked to express their thoughts on the following items:

1. I respect the opinions of my closest friend(s).

2. My best friend(s) would stick by me if I got in trouble.

3. The people I think of as my best friend(s) also think of me as a best friend.

4. I fit in well with my best friend(s).

5. My best friend(s) take an interest in my problems.

6. I take an interest in the problems of my closest friend(s).

The respondents were asked to use a four-point Likert scale to describe the level of attachment they had with their close friends. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. This variable is labeled *attachment to peers.* And lastly, the Cronbach's alpha for this scale is .913.

Fourth, as seen in Table 1.3 another commonly used measure for attachment is that of attachment to school. In the current study the respondents were asked to respond to the following items:

1. I care a lot what my teachers think of me.

2. Most of my teachers are not interested in anything I say or do. (reverse coded)

3. Getting an education is important to me.

4. I would quit school now if I could. (reverse coded)

5. Most of my classes are a waste of time. (reverse coded)

6. I look forward to coming to school most mornings.

The respondents were given a four-point Likert scale to respond to the items above. The response categories for this scale range from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. The Cronbach's alpha for this scale is .698. Finally, this variable is labeled *attachment to school*.

Beyond attachment, the survey instrument contained measures of the social bond of commitment. Commitment reflects the cost involved in engaging in deviant behavior. An

individual's commitment to conventional lines of activity provide a stake in conformity that, when strong enough, makes it too costly for the individual to engage in any behavior that will compromise his or her commitment to those activities (Hirschi, 1969) . Individuals must then weigh their "stake in conformity" when deciding whether or not to engage in deviant behavior. The current study asks the respondents to indicate their level of commitment, or "stake" in conventional activities. First, the respondents were asked how to best describe their grade point average. The response categories for this measure ranged from 1 = A, 2 = B, 3 = C, 4 = D, 5 = F. And finally, this variable is labeled *student GPA.*

 Second, Table 1.3 reveals that previous studies have completion of school as a measure of commitment. For the current study, the respondents were asked how much school they thought they would complete. The response categories ranged from 1 = some high school, 2 = high school/GED, 3 = vocational/trade school, 4 = some college, 5 = college degree, 6 = graduate or professional school after college, 7 = don't know. Finally, this variable is labeled *commitment to school.*

 In addition to attachment and commitment, the survey instrument contained measures of the social bond of involvement. According to Hirschi (2003), a day filled with activities meant that juveniles would not have enough time to engage in crime. Table 1.3 indicates that previous studies have used involvement in school activities as a measure for social bond. In the current study, the respondents were asked how often during the school year they were involved in school sports or other school activities. A dummy variable for this measure was created and the response categories are 0 = no, 1 = yes. This variable is labeled *involvement in school activities*.

 Second, Table 1.3 reveals that previous studies have used involvement in community activities as a measure for social bond. In the current study, the respondents were asked how

many hours per week during the school year they were involved in activities within the community, or whether they worked at a part-time job during a school year. A dummy variable was created for this measure with the response categories labeled as 0 = no, 1 = yes. Lastly, this variable is labeled *involvement in community activities*

Self-Control Measures

This study has incorporated two measures of self-control that are consistent with past measures of self-control theory. Gottfredson and Hirschi (1990) use the term low self-control to explain criminal propensity that increases the probability that individuals will be unable to resist the easy, immediate gratification provided by crime, and by behaviors "analogous" to crime. Offenders with low-self-control contend that crime is easy to commit, that it requires minimal planning, involves few physical skills, and provides immediate gratification. The data contains one scale that assesses the elements of low self-control such as impulsivity, insensitivity, physicality, risky behavior, short sightedness, and inattentiveness. The respondents were instructed to indicate how often certain behaviors were applicable to themselves. They were presented with the following items:

1. I have trouble controlling my temper.

2. I have difficulty remaining seated at school.

3. I get very restless after a few minutes if I am supposed to sit still.

4. When I am angry, I lose control over my actions.

5. I have difficulty keeping attention on tasks.

6. I get so frustrated that I feel like a bomb ready to explode.

7. Little things or distractions/interruptions throw me off.

8. I'm nervous or on edge.

9. I can't seem to stop moving.

10. I don't pay attention to what I'm doing.

11. I am afraid I will lose control of my feelings.

The respondents were given a four-point Likert scale to assess how often the previous statements were true or false. The response categories for this scale ranged from 1 = never true, 2 = sometimes true, 3 = mostly true, 4 = always true. This variable is labeled *impulsivity*. And lastly, the Cronbach's alpha for this scale is .909.

General Strain Measures

The current study has utilized measures of general strain that have been used in previous empirical tests of general strain theory. Similar to Robert Merton (1938), Agnew proposed that the failure to achieve positively valued goals is a type of strain, but extended it by asserting that there are three specific ways to fail to achieve positively valued goals. One of them was the gap between just/fair outcomes and actual outcomes examines. This gap examines the role between equity and justice. These individuals will experience strain when they begin to feel as though they are being treated unfairly. Agnew (2001) argued that strain that is unjust is a type of strain that is most conducive to criminal behavior. In this regard, the respondents for this study were asked to respond to the following items:

1. All students are treated fairly.

2. The school rules are fair.

3. The punishment for breaking school rules is the same for all students no matter who you are.

4. If a school rule is broken, students know what kind of punishment will follow

5. The teachers are fair

6. The principal is fair

The respondents were given a four-point Likert scale to assess their perception of fair and just treatment. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. The Cronbach's alpha for this scale is .724. And finally, this variable is labeled *perceived injustice*.

Beyond the concept of just and unjust outcomes, the survey instrument contained measures of the strain Agnew (1992) labeled the presentation of noxious stimuli. This occurs when an individual is presented with a noxious or aversive stimulus. According to Agnew (1992), youths who were presented with a negative stimulus would be presented with high amounts of strain.

As evident in Table 1.6, one common measure of the presentation of noxious stimuli is victimization. The current study uses three specific measures of victimization as an indicator of strain in the form of noxious stimuli. The survey instrument provides measures of fear of victimization, the odds of victimization, and actual victimization. First, the respondents were asked to indicate whether they feared or worried they would be victimized at school. They were asked to respond to the following items:

1. Be physically attacked (example: punched, slapped, kicked)

2. Be forced to give up your money or property

3. Have money or property stolen when you are not around

4. Receive unwelcome sexual remarks from someone

5. Be touched by someone in a sexual manner without your consent or against your will

73

6. Have a gun pulled on you

7. Have a weapon pulled on you (knife, brass knuckles, and so on, other than gun

The respondents were presented with a five-point Likert scale to express their level of fear of victimization while in school or at school related activities over the past year. The response categories ranged from 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always. The Cronbach's alpha for this scale is .828. And lastly, this variable is labeled *perceived risk of victimization.*

Second, the respondents were asked how many times during the school year were they actually victimized during school or while at school related activities. The respondents were asked to respond to the following items:

1. Been physically attacked (example: punched, slapped, kicked)

2. Been forced to give up your money or property

3. Had money or property stolen when you were not around

4. Received unwelcome sexual remarks from someone

5. Been touched by someone in a sexual manner without your consent or against your will

6. Had a gun pulled on you

7. Had a weapon pulled on you (knife, brass knuckles, and so on, other than gun)

 The response categories for this scale ranged from 0, 1, 2, 3, 4, 5, 6 ,7, 8, 9, 10+. The Cronbach's alpha for this scale is .653. And lastly, this variable is labeled *actual victimization*.

Beyond using the measure of victimization for the strain Agnew (1992) labeled the presentation of noxious stimuli, Table 1.6 indicates that another commonly used measure in previous studies is that of hostile situations. Hostile or aversive stimuli are similar to Agnew's

74

(1985) description of a blockage of pain-avoidance behavior. He explained how youths who were presented with aversive situations at school, or hostile peers would experience high amounts of strain. The survey instrument used for this study provided two such measures.

First, the respondents were asked to indicate the frequency of their teachers' response when there was an act of violence at school. They were presented with the following items:

1. Watch without doing anything
2. Report it to the proper people (teacher, principal)

The respondents were given a five-point Likert scale to express their teachers' responses to violence at school. The response categories for this scale ranged from 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always. The Cronbach's alpha for this scale is .766. Finally, this variable is labeled *teacher hostilities.*

Second, the respondents were asked to indicate whether they had been teased or picked on in any way due to the fact that the youth was a member of a particular group. The response categories for this variables ranged from 0 = no, 1 = yes. This variable is labeled *peer hostilities.*

MEASURES OF DEPENDENT VARIABLES

The overall intent of the current study is to further our understanding of what influences the extent to which adolescents are involved in drug and alcohol use. To this end, the current study will attempt to explain involvement in three specific types of substance use: alcohol use, drug use, and tobacco use.

Measures of Alcohol Use

This particular outcome has four specific types of measures. First, the respondents were asked to indicate how much alcohol they usually drink in one specific sitting. The response

categories for this scale were 1 = don't drink, 2 = small amount (1 beer, 1 drink or less), 3 = medium amount (2 to 3 beers or drinks), 4 = large amount (4 to 8 beers or drinks), 5 = very large amount (9 or more beers or drinks). And lastly, this variable is labeled *binge drinking.*

Second, in an effort to determine frequency of alcohol use over time, the respondents were asked to indicate how often they had a drink of alcohol throughout the school year. The respondents were presented with a five-point Likert scale to express their frequency of alcohol use throughout the school year. The response categories for this scale ranged from 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily. And finally, this variable is labeled *frequency of alcohol use over time.*

Third, the respondents were asked how often they had experienced any specific consequences that were a result of excessive use of alcohol. In this regard, the respondents were presented with the following items:

1. Had a hangover?
2. Gotten sick to your stomach/vomited?
3. Been unable to remember what you did?

The respondents were presented with a five-point Likert scale to express any personal consequences experienced from excessive drinking. The response categories for this scale ranged from 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always. The Cronbach's alpha for this scale .736. And lastly, this variable is labeled *problem drinking*.

Fourth, the survey instrument provides a measure of problem drinking over time. The respondents were asked to indicate how often they had been drunk throughout the school year. The respondents were given a five-point Likert scale to describe how often within the school year they had been drunk. The response categories for this scale ranged from 1 = never, 2 = less

than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost

daily. And finally, this variable is labeled *problem drinking over time.*

Measures of Drug Use

The outcome of drug use has two specific measures. For the current study, the

respondents were asked to specify how often they had engaged in the use of marijuana

throughout the school year. The response categories for this scale ranged from 1 = never, 2 = less

than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost

daily. The variable for this scale is labeled *frequency of marijuana use*.

Second, the respondents were asked to indicate how often throughout the school year

they had used illicit drugs. The respondents were presented with the following items:

1. Used inhalants (huffing)?

2. Used cocaine/crack?

3. Used speed?

4. Used crystal meth?

The respondents were given a five point Likert scale to express their frequency of drug use. The

response categories for this scale ranged from 1 = never, 2 = less than once a month, 3 = about

once a month, 4 = about 1-2 times per week, 5 = daily or almost daily. The Cronbach's alpha for

this scale is .911. Lastly, this variable is labeled *frequency of drug use*.

Measures of Tobacco Use

The outcome of tobacco use has three specific measures. First, the respondents were

asked to indicate how many cigarettes on average they smoked per day. The respondents were

asked to give a numerical number in the response category to express how many cigarettes they

smoked per day. This variable is labeled *frequency of smoking*. The analysis was originally run with all cases included in the model. However, some students appeared to respond with a frequency of smoking that seemed extreme, suggesting either exaggerated or erroneous responses. As a result, the analysis was re-run using only those cases with youths' reporting smoking 40 or less. This was done for the general sample and separately for males and females. Note that the empirical result were substantively the same regardless of whether all cases of only those smoking 40 or under were included.

Second, the respondents were asked to specify how soon they smoked a cigarette after waking up in the morning. The respondents were presented with a five-point Likert scale to express how quickly they would smoke in the morning. The response categories for this scale ranged from 1 = within five minutes, 2 = within 6 to 15 minutes, 3 = within 16 to 30 minutes, 4 = within 31 minutes to an hour, 5 = over an hour. Finally, this variable is labeled *smoking dependency*.

Third, the respondents were asked to indicate how often over the school year they had used tobacco products such as cigarettes, cigars, and chewing tobacco. The respondents were presented with a five-point Likert scale to express how often they had smoked cigarettes, smoked cigars, and used chewing tobacco throughout the school year. The response categories for this scale ranged from 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily. Lastly, this variable is labeled *use of tobacco over time*.

MEASURES OF CONTROL VARIABLES

The survey instrument for the current study provides for four specific types of control variables. In this regard, the current study will include measures for demographics, socioeconomic status, children from broken homes, and opportunity.

Demographics

The current study has three specific demographic measures. First, the respondents were asked to reveal their gender by indicating whether they were male or female. The respondents were simply asked to circle male or female on the survey instrument. This variable is labeled *gender*. Second, the respondents were asked to indicate their age by revealing their birthdate. The respondents were asked to answer this question in the familiar month/day/year form. This variable is labeled *age*. Third, the respondents were asked to specify what race they were. The respondents were presented with a list of different races and were asked how they would best describe themselves as. The response categories for this scale were 0 = non-white, 1 = white. This variable is labeled *race.*

Family Instability

One measure of family instability was used. The respondents were asked to indicate how many times they had moved within the past year. This measure will reveal the level of disruption multiple moves within a year may cause for a young person. The response categories for this scale ranged from: 1 = 0 times, 2 = 1 time, 3 = 2 times, 4 = 3 times, 5 = 4 times, 6 = 5 times, 7 = more than 5 times. And finally, this variable is labeled *number of times moved.*

Opportunity

The survey instrument for the current study had three specific measures of opportunity. First, the respondents were asked to specify how easy it was for someone their age to acquire alcohol in a single school day. The respondents were presented with a four-point Likert scale to express the daily availability of alcohol. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. And finally, this variable is labeled *opportunity to obtain alcohol*.

Second, the respondents of the current study were asked to indicate how easy it was for someone their age to have access to cigarettes during a single school day. The respondents were presented with a four-point Likert scale to explain how easy it is to acquire cigarettes in a single day. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. And lastly, this variable is labeled *opportunity to obtain tobacco.*

Third, the respondents were asked to specify how easy it was for someone their age to attain marijuana in a single school day. The respondents were presented with a four-point Likert scale to express the daily availability of marijuana. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. And finally, this variable is labeled *opportunity to obtain marijuana*.

Fourth, the respondents were asked to specify how easy it was for someone their age to attain marijuana in a single school day. The respondents were presented with the following items:

1. Inhalants (for "huffing")
2. Cocaine/Crack

3. Ecstasy

4. OxyContin

5. Other pills

The respondents were presented with a four-point Likert scale to express the daily availability of illicit drugs. The response categories for this scale ranged from 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree. The Cronbach's alpha for this scale is .831. And lastly, this variable is labeled *opportunity to obtain drugs.*

Table 2.1 provides an overview of all the measures mentioned above that have an alpha. Descriptive statistics for all the study variables described above are seen below in Table 2.2. Correlation tables for the entire sample, males and females can be seen in the appendix of this paper.

Table 2.1 Alpha Coefficients for Study Variables

Variable	α
Dependent Variables	
Binge Drinking	
Frequency of Alcohol Use over Time	
Problem Drinking	.736
Problem Drinking over Time	
Frequency of Marijuana Use	
Frequency of Drug Use	.911
Frequency of Smoking	
Smoking Dependency	
Tobacco Use over Time	
Social Learning Variables	
Delinquent Peers	.836
Family use of Tobacco	
Use of Tobacco at School	
Pro-Social Beliefs	.852
Anti-Social Beliefs	.868
Social Bond Variables	
Attachment to Parents	.913
Direct Supervision	.813
Attachment to Peers	.913
Attachment to School	.698
Student GPA	
Commitment to School	
Involvement in School Activities	
Involvement in Community Activities	
Self-Control Variables	
Impulsivity	.909
General Strain Variables	
Perceived Injustice	.724
Perceived Victimization	.828
Actual Victimization	.653
Teacher Hostilities	.766
Peer Hostilities	

Table 2.1 Alpha Coefficients for Study Variables cont…

Variable	Cronbach's Alpha α
Control Variables	
Gender	
Age	
Race	
Number of Times Moved	
Opportunity to Obtain Alcohol	
Opportunity to Obtain Tobacco	
Opportunity to Obtain Marijuana	
Opportunity to Obtain Drugs	.831

Table 2.2 Summary Statistics for Study Variables

Variable	Min	Max	Total M(SD)	Male M(SD)	Female M(SD)
Dependent Variables					
Binge Drinking	1	5	1.64(1.11)	1.66(1.13)	1.62(1.09)
Frequency of Alcohol Use over Time	1	5	1.62(.998)	1.65(1.05)	1.60(.947)
Problem Drinking	1	5	2.14(1.01)	2.17(1.02)	2.12(.997)
Problem Drinking over Time	1	5	1.42(.892)	1.47(.958)	1.38(.828)
Frequency of Marijuana Use	1	5	1.33(.897)	1.40(.999)	1.26(.789)
Frequency of Drug Use	1	5	1.06(.374)	1.09(.478)	1.03(.244)
Frequency of Smoking	0	48	9.36(14.46)	9.70(14.69)	8.96(14.57)
Smoking Dependency	1	5	3.30(1.63)	3.30(1.62)	3.34(1.64)
Tobacco Use over Time	1	5	1.59(1.24)	1.58(1.24)	1.60(1.24)
Social Learning Variables					
Delinquent Peers	0	1	.338(.330)	.335(.334)	.341(.326)
Family use of Tobacco	0	1	.210(.409)	.210(.405)	.220(.413)
Use of Tobacco at School	0	1	.070(.853)	.070(.249)	.070(.249)
Pro-Social Beliefs	1	4	3.41(.853)	3.41(.844)	3.40(.866)
Anti-Social Beliefs	1	4	1.60(.649)	1.60(.635)	1.61(.622)
Social Bond Variables					
Attachment to Parents	1	5	3.69(.771)	3.73(.751)	3.36(.787)
Direct Supervision	1	5	3.83(.933)	3.78(.925)	3.87(.937)
Attachment to Peers	1	4	3.56(.612)	3.38(.691)	3.71(.482)
Attachment to School	1	4	3.16(.533)	3.05(.580)	3.27(.506)
Student GPA	1	5	3.99(.907)	3.84(.945)	4.12(.849)
Commitment to School	1	7	5.13(1.20)	4.96(1.31)	5.29(1.07)
Involvement in School Activities	0	1	.760(.425)	.760(.428)	.770(.423)
Involvement in Community Activities	0	1	.830(.372)	.840(.368)	.830(.378)
Self-Control Variables					
Impulsivity	1	4	1.80(.674)	1.84(.695)	1.77(.653)
General Strain Variables					
Perceived Injustice	1	4	2.23(.627)	2.28(.647)	2.19(.605)
Perceived Victimization	1	5	1.74(.741)	1.73(.728)	1.76(.753)
Actual Victimization	1	1	1.03(1.30)	1.00(1.41)	1.06(1.19)
Teacher Hostilities	1	5	4.45(.921)	4.45(.916)	4.45(.927)
Peer Hostilities	0	1	.310(.462)	.310(.462)	.310(.463)

Control Variables

Gender	0	1	.530(.499)	0.00(0.00)	1.00(0.00)
Age	12	19	14.85(1.23)	14.89(1.24)	14.7(1.21)
Race	0	1	.900(.294)	.900(.299)	.910(.290)
Number of Times Moved	1	7	1.22(.639)	1.21(.642)	1.22(.636)
Opportunity to Obtain Alcohol	1	4	2.23(1.09)	2.24(1.11)	2.23(1.07)
Opportunity to Obtain Tobacco	1	4	3.02(1.08)	2.99(1.10)	3.06(1.07)
Opportunity to Obtain Marijuana	1	4	2.40(1.96)	2.40(1.17)	2.39(1.13)
Opportunity to Obtain Drugs	1	4	1.96(.938)	1.91(.943)	2.00(.932)

Chapter 3

RESULTS

This chapter begins with a description of the results of the analysis of the extent the variables of social learning theory, social bond theory, self-control theory, and general strain theory were able to predict substance use. This chapter will then focus on the extent to which these predictors of substance use identified by the major theories are general or gender specific. Tolerance levels and the variance inflation factor were assessed for each predictor to gauge the existence of multicollinearity among the variables. All of the study variables were under the threshold needed to indicate that multicollinearity exists.

ALCOHOL- RELATED MODELS

Sources of Binge Drinking

Table 3.1 presents the results of the sources of binge drinking. The results reveal that age and opportunity to obtain alcohol are the only two statistically significant control variables in this model. All of the social learning variables, with the exception of delinquent friends, exert statistically significant effects on this outcome. These findings indicate that delinquent friends and family along with definitions of crime are significant predictors of binge drinking among adolescents.

Attachment to school was found to have the only significant effect among the social bond variables, showing that the level of school attachment does have an influence on binge drinking among youths. Impulsivity, the only theoretical variable for self-control, was not significant. Notable, four of the five variables of general strain theory were found to be statistically

significant. The first two, perceived injustice and perceived risk of victimization indicate that an

unjust or unfair outcome which produce high amounts of strain can lead to binge drinking. The

findings with regard to teacher hostilities and, peer hostilities reveal that the presentation of

noxious stimuli increases the likelihood of youths engaging in binge drinking.

Sources of Alcohol Use over Time

Table 3.2 presents the results of alcohol use over time. The results of the control

variables indicate that age and race were statistically significant. Opportunity to obtain alcohol,

tobacco, and drugs were also significant predictors of youths who had drank alcohol throughout

the school year. The theoretical variable delinquent peers was the only significant predictor

among the social learning variables. These findings indicate that delinquent peers do have an

influence over youths drinking alcohol over time.

Of the eight social bond variables, six exert statistically significant effects on this outcome.

Thus, the social bonds of attachment, commitment, and involvement are significant predictors of

alcohol use within a school year among youths. Impulsivity, a measure of self-control was

statistically significant. These findings indicate that the desire for immediate gratification exerts

significant influence over alcohol use among adolescents.

Of the general strain variables, three of five variables were statistically significant.   The

predictor perceived injustice, which can result in high amounts of strain, will affect the use of

alcohol among youths.   Actual victimization and teacher hostilities wield statistically significant

influence on this outcome. These findings suggest that the presence of noxious stimuli increases

the likelihood of youths partaking in alcohol throughout the school year.

Table 3.1 Sources of Binge Drinking

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.000	.000	.038
Family use of Tobacco	.193	.071**	.026
Use of Tobacco at School	.203	.045**	.043
Pro-Social Beliefs	-.432	-.324**	.014
Anti-Social Beliefs	.397	.230**	.018
Social Bond Variables			
Attachment to Parents	.008	.006	.020
Direct Supervision	-.019	-.016	.016
Attachment to Peers	-.021	-.011	.019
Attachment to School	.066	.032**	.025
Student GPA	.012	.010	.014
Commitment to School	.008	.009	.010
Involvement in School Activities	.003	.001	.025
Involvement in Community Activities	.013	.004	.029
Self-Control Variables			
Impulsivity	.000	.000	.018
General Strain Variables			
Perceived Injustice	.053	.030*	.021
Perceived Risk of Victimization	.083	.054**	.015
Actual Victimization	.001	.001	.009
Teacher Hostilities	.035	.027**	.013
Peer Hostilities	-.090	-.038**	.023
Control Variables			
Gender	-.056	-.025*	.023
Age	-.004	-.005	.010
Race	-.058	-.015	.038
Number of Times Moved	.019	.011	.017
Opportunity to Obtain Alcohol	.006	.006	.014
Opportunity to Obtain Tobacco	-.011	-.011	.014
Opportunity to Obtain Marijuana	.032	.033	.015
Opportunity to Obtain Drugs	-.049	-.041**	.017

Note: * $p < .05$ level ** $p < .01$ level R^2: .232

Table 3.2 Sources of Alcohol Use over Time

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.732	.246**	.032
Family use of Tobacco	.019	.008	.022
Use of Tobacco at School	-.055	-.014	.036
Pro-Social Beliefs	.006	.005	.011
Anti-Social Beliefs	.001	.001	.015
Social Bond Variables			
Attachment to Parents	.041	.032*	.017
Direct Supervision	-.170	-.162**	.014
Attachment to Peers	.076	.046**	.016
Attachment to School	-.139	-.077**	.021
Student GPA	-.032	-.029*	.011
Commitment to School	-.012	-.014	.008
Involvement in School Activities	.009	.004	.021
Involvement in Community Activities	.059	.022*	.024
Self-Control Variables			
Impulsivity	.106	.072*	.015
General Strain Variables			
Perceived Injustice	.097	.062*	.018
Perceived Risk of Victimization	-.010	-.008	.013
Actual Victimization	.070	.088*	.008
Teacher Hostilities	.022	.020*	.011
Peer Hostilities	.012	.006	.020
Control Variables			
Gender	.016	.008	.019
Age	.058	.073*	.008
Race	.131	.037*	.032
Number of Times Moved	.019	.012	.014
Opportunity to Obtain Alcohol	.081	.089*	.012
Opportunity to Obtain Tobacco	-.003	-.004	.012
Opportunity to Obtain Marijuana	.105	.123**	.013
Opportunity to Obtain Drugs	-.107	-.102**	.014

Note: * $p < .05$ level ** $p < .01$ level R^2 .299

Sources of Problem Drinking

The findings for the sources of problem drinking are presented in Table 3.3. In the model, none of the control variables were found to be statistically significant. Of the five social learning variables, four were found to have a significant effect of problem drinking. These findings suggest that deviant friends and family as well definitions favorable to crime are significant predictors of problem drinking among adolescents.

None of the social bond variables were statistically significant. Impulsivity was not statistically significant either. Among the general strain variables, only perceived risk of victimization was significant, suggesting that unjust or unfair outcomes that result in high amounts of strain have significant influence over problem drinking among youths.

Sources of Problem Drinking over Time

The results of problem drinking over time are presented in Table 3.4. Among the control variables, age and race are significant predictors of the outcome. Opportunity to obtain alcohol, tobacco, marijuana, and other illicit drugs exerts statistically significant effects on problem drinking over time.

Delinquent peers was the only social learning variable to be a significant predictor of this youth's problem drinking over time. These findings signify that an adolescent with peers who engage in crime is more likely to have gotten drunk throughout the school year. Seven of the eight social bond variables were statistically significant. These findings indicate that the level of attachment, commitment and involvement a youth has manifests significant influence on the likelihood of a youth engaging in problem drinking over time. Impulsivity is a significant predictor of problem drinking over time.

Of the general strain variables, three were found to be statistically significant. Perceived injustice indicates that an unjust or unfair outcome, which results in high amount of strain, can lead to problem drinking over time. The findings with regard to teacher hostilities and actual victimization make known that the presentation of noxious stimuli increases the probability of youths engaging in problem drinking over time.

DRUG-RELATED MODELS

Sources of the Frequency of Marijuana Use

The results of frequency of marijuana use are displayed in Table 3.5. Opportunity to obtain alcohol, tobacco, marijuana, and drugs were statistically significant predictors of marijuana use. This could imply that access to such contraband increases the likelihood of youths using marijuana. Age and gender were the other two control variables found to be statistically significant.

Of the five social learning variables delinquent peers was the only significant predictor in this model. These findings signify that youths who have peers engaging in delinquent behavior are more likely to exhibit the same behavior. Attachment to parents, direct supervision, attachment to peers, and attachment to school are all significant predictors of a youth's frequency of marijuana use. Along with attachment, the social bond variables of commitment were statistically significant. These findings purport that an adolescent's GPA or expectation of the completion of school has a significant effect on the use of marijuana.

Table 3.3 Sources of Problem Drinking

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	-.020	-.007	.067
Family use of Tobacco	.150	.066**	.041
Use of Tobacco at School	.161	.049**	.060
Pro-Social Beliefs	-.261	-.207**	.024
Anti-Social Beliefs	.213	.174**	.028
Social Bond Variables			
Attachment to Parents	-.035	-.027	.035
Direct Supervision	.023	.021	.028
Attachment to Peers	-.026	-.015	.033
Attachment to School	-.002	-.001	.045
Student GPA	-.021	-.018	.024
Commitment to School	.026	.029	.017
Involvement in School Activities	-.019	-.008	.043
Involvement in Community Activities	-.028	-.011	.047
Self-Control Variables			
Impulsivity	-.029	-.019	.031
General Strain Variables			
Perceived Injustice	.006	.003	.036
Perceived Risk of Victimization	.198	.151**	.025
Actual Victimization	.016	.019	.017
Teacher Hostilities	.019	-.018	.020
Peer Hostilities	-.073	-.034	.040
Control Variables			
Gender	-.057	-.028	.039
Age	.008	.009	.017
Race	-.001	.000	.064
Number of Times Moved	.003	.002	.028
Opportunity to Obtain Alcohol	-.012	-.013	.025
Opportunity to Obtain Tobacco	-.009	-.010	.024
Opportunity to Obtain Marijuana	.030	.035	.026
Opportunity to Obtain Drugs	-.039	-.037	.029

Note: * $p < .05$ level ** $p < .01$ level R^2: .138

Table 3.4 Sources of Problem Drinking over Time

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.608	.230**	.029
Family use of Tobacco	.024	.011	.020
Use of Tobacco at School	-.064	-.018	.033
Pro-Social Beliefs	.006	.005	.010
Anti-Social Beliefs	.015	.011	.013
Social Bond Variables			
Attachment to Parents	.052	.046**	.015
Direct Supervision	-.126	-.135**	.012
Attachment to Peers	.074	.049**	.015
Attachment to School	-.117	-.073**	.019
Student GPA	-.050	-.051**	.010
Commitment to School	-.032	-.042**	.008
Involvement in School Activities	.010	.005	.019
Involvement in Community Activities	.046	.019*	.022
Self-Control Variables			
Impulsivity	.103	.079**	.014
General Strain Variables			
Perceived Injustice	.069	.049**	.016
Perceived Risk of Victimization	-.018	-.015	.012
Actual Victimization	.061	.086**	.007
Teacher Hostilities	.019	.019*	.010
Peer Hostilities	.023	.012	.018
Control Variables			
Gender	-.007	-.004	.017
Age	.066	.094**	.007
Race	.089	.029**	.029
Number of Times Moved	.025	.018	.013
Opportunity to Obtain Alcohol	.054	.067**	.011
Opportunity to Obtain Tobacco	-.025	-.031*	.011
Opportunity to Obtain Marijuana	.100	.132**	.012
Opportunity to Obtain Drugs	-.086	-.092**	.013

Note: * $p < .05$ level ** $p < .01$ level R^2: .259

Impulsivity is statistically significant in this model. This finding suggests that the need for immediate gratification increases the probability that youths will use marijuana throughout the school year. Of the general strain variables, perceived injustice, actual victimization, and teacher hostilities were statistically significant. These findings indicate that an unfair or unjust outcome, which results in high amounts of strain, will likely lead a youth to engage in the use of marijuana. Teacher hostilities, which will lead to an aversive situation for an adolescent, will increase the likelihood of the use of marijuana.

Sources of the Frequency of Drug Use

Table 3.5 presents the results of the frequency of drug use. The opportunity to obtain tobacco, marijuana, and illicit drugs are statistically significant. These findings indicate that a youth's likelihood for such opportunities increases the chances that they will engage in such analogous behavior. Age is the only other statistically significant control variable in this model.

Of the social learning variables, delinquent peers exerts statistically significant effects on this outcome. These findings suggest that youths who associate with delinquent youths are likely to engage in illicit drug use. The outcomes of this model reveal that the level of direct supervision is a statistically significant predictor of adolescent drug use. Attachment to peers and attachment to school are the other two social bond variables that are statistically significant in this model.

Impulsivity, a measure of self-control, is a statistically significant predictor of youths engaging in drug use. Of the five general strain variables, actual victimization was the only significant predictor in this model. These findings suggest that victimization can lead to high amounts of strain which will then increase the probability that the youth will engage drug use.

94

Table 3.5 Sources of Marijuana Use

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.495	.187**	.029
Family use of Tobacco	.013	.006	.020
Use of Tobacco at School	.049	.014	.033
Pro-Social Beliefs	.008	.008	.011
Anti-Social Beliefs	-.006	-.004	.014
Social Bond Variables			
Attachment to Parents	.032	.028*	.016
Direct Supervision	-.111	-.119**	.013
Attachment to Peers	.042	.028**	.015
Attachment to School	-.109	-.068**	.020
Student GPA	-.077	-.079**	.011
Commitment to School	-.031	-.041**	.008
Involvement in School Activities	.001	.001	.020
Involvement in Community Activities	.022	.009	.023
Self-Control Variables			
Impulsivity	.112	.085**	.014
General Strain Variables			
Perceived Injustice	.068	.048**	.016
Perceived Risk of Victimization	-.013	-.011	.012
Actual Victimization	.050	.071**	.007
Teacher Hostilities	.030	.030**	.010
Peer Hostilities	.014	.007	.018
Control Variables			
Gender	-.048	-.028**	.018
Age	.015	.021*	.008
Race	.007	.002	.030
Number of Times Moved	.016	.012	.013
Opportunity to Obtain Alcohol	-.035	-.044**	.011
Opportunity to Obtain Tobacco	-.038	-.047**	.011
Opportunity to Obtain Marijuana	.182	.240**	.012
Opportunity to Obtain Drugs	-.081	-.086**	.013

Note: * $p < .05$ level ** $p < .01$ level R^2: .230

Table 3.6 Sources of Drug Use

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.138	.133**	.012
Family use of Tobacco	-.003	-.003	.008
Use of Tobacco at School	.016	.011	.014
Pro-Social Beliefs	.007	.018	.004
Anti-Social Beliefs	.000	.001	.006
Social Bond Variables			
Attachment to Parents	.005	.012	.007
Direct Supervision	-.014	-.038**	.005
Attachment to Peers	-.024	-.041**	.006
Attachment to School	- .027	-.043**	.008
Student GPA	.001	.002	.004
Commitment to School	-.006	-.019	.003
Involvement in School Activities	.005	.007	.008
Involvement in Community Activities	- .005	-.006	.009
Self-Control Variables			
Impulsivity	.044	.085**	.006
General Strain Variables			
Perceived Injustice	.006	.011	.007
Perceived Risk of Victimization	-.009	-.018	.005
Actual Victimization	.053	.192**	.003
Teacher Hostilities	.007	.019	.004
Peer Hostilities	.002	.003	.008
Control Variables			
Gender	- .039	-.057**	.007
Age	- .002	-.009	.003
Race	-.010	-.008	.012
Number of Times Moved	- .005	-.010	.006
Opportunity to Obtain Alcohol	.005	.016	.005
Opportunity to Obtain Tobacco	-.023	-.072**	.005
Opportunity to Obtain Marijuana	-.013	-.042*	.005
Opportunity to Obtain Drugs	.043	.116**	.005

Note: * $p < .05$ level ** $p < .01$ level R^2: .129

TOBACCO-RELATED MODELS

Sources of Smoking

The results of the frequency of smoking are presented in Table 3.7. None of the variables in this model were found to be statistically significant. Thus, the results suggest that the theoretical variables used in this study cannot significantly predict the daily smoking habits of youths.

Sources of Smoking Dependency

Table 3.8 presents the results of the sources of smoking dependency. Use of tobacco at school was the only statistically significant variable in the model. These results suggest that the ability to use tobacco products at school will increase the likelihood that they will become more dependent on cigarettes. The results indicate that the other variables within the model do not significantly predict the daily dependency on smoking of youths.

Sources of Tobacco Use over Time

Table 3.9 presents the results of tobacco use over time. Each of the eight control variables is statistically significant. Age, gender, race, and number of times moved are all significantly predictive of the outcome. The opportunity variables of alcohol, tobacco, marijuana, and drugs are statistically significant. These findings signify that the opportunity to obtain such contraband will increase the likelihood that youths will partake in tobacco products throughout the school year.

Table 3.7 Sources of the Frequency of Smoking

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.619	.027	.835
Family use of Tobacco	.370	.020	.551
Use of Tobacco at School	1.687	.056	.906
Pro-Social Beliefs	-.234	-.026	.294
Anti-Social Beliefs	.338	.028	.389
Social Bond Variables			
Attachment to Parents	-.338	-.034	.448
Direct Supervision	-.292	-.036	.359
Attachment to Peers	.340	.025	.431
Attachment to School	.813	.058	.562
Student GPA	-.422	-.048	.299
Commitment to School	.106	.016	.214
Involvement in School Activities	-.367	-.021	.536
Involvement in Community Activities	-.734	-.034	.649
Self-Control Variables			
Impulsivity	-.435	-.039	.388
General Strain Variables			
Perceived Injustice	.266	.021	.465
Perceived Risk of Victimization	-.626	-.058	.340
Actual Victimization	-.009	-.001	.198
Teacher Hostilities	-.290	-.032	.283
Peer Hostilities	-.753	-.046	.505
Control Variables			
Gender	-.414	-.027	.484
Age	-.223	-.037	.209
Race	-.334	-.012	.850
Number of Times Moved	-.251	-.022	.352
Opportunity to Obtain Alcohol	-.275	-.040	.295
Opportunity to Obtain Tobacco	.106	.016	.302
Opportunity to Obtain Marijuana	-.067	-.010	.336
Opportunity to Obtain Drugs	-.012	-.002	.357

Note: * $p < .05$ level ** $p < .01$ level R^2: .025

Table 3.8 Sources of Smoking Dependency

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.227	.046	.177
Family use of Tobacco	-.114	-.029	.117
Use of Tobacco at School	-.413	-.064*	.190
Pro-Social Beliefs	.053	.027	.063
Anti-Social Beliefs	-.046	-.018	.083
Social Bond Variables			
Attachment to Parents	.051	.023	.094
Direct Supervision	.077	.043	.076
Attachment to Peers	-.012	-.004	.091
Attachment to School	-.176	-.057	.120
Student GPA	.032	.017	.064
Commitment to School	-.040	-.028	.046
Involvement in School Activities	-.088	-.023	.114
Involvement in Community Activities	.139	.030	.138
Self-Control Variables			
Impulsivity	-.078	-.032	.083
General Strain Variables			
Perceived Injustice	-.123	-.045	.099
Perceived Risk of Victimization	.069	.030	.072
Actual Victimization	.017	.013	.042
Teacher Hostilities	.011	.005	.059
Peer Hostilities	.143	.040	.107
Control Variables			
Gender	.066	.020	.103
Age	-.011	-.008	.044
Race	-.143	-.023	.183
Number of Times Moved	-.022	-.008	.077
Opportunity to Obtain Alcohol	.037	.025	.063
Opportunity to Obtain Tobacco	-.013	-.009	.065
Opportunity to Obtain Marijuana	-.025	-.018	.071
Opportunity to Obtain Drugs	.113	.065	.075

Note: * $p < .05$ level ** $p < .01$ level R^2: .022

Table 3.9 Sources of Tobacco Use over Time

Variable	b	β	SE
Social Learning Variables			
Delinquent Peers	.850	.231**	.040
Family use of Tobacco	.027	.009	.028
Use of Tobacco at School	.046	.009	.045
Pro-Social Beliefs	-.002	-.001	.014
Anti-Social Beliefs	.000	.000	.019
Social Bond Variables			
Attachment to Parents	-.031	-.020	.021
Direct Supervision	-.092	-.071**	.017
Attachment to Peers	.052	.025*	.021
Attachment to School	-.192	-.086**	.027
Student GPA	-.176	-.130**	.014
Commitment to School	-.064	-.061**	.010
Involvement in School Activities	.030	.011	.027
Involvement in Community Activities	.033	.010	.031
Self-Control Variables			
Impulsivity	.160	.088**	.019
General Strain Variables			
Perceived Injustice	.041	.021	.022
Perceived Risk of Victimization	-.019	-.012	.016
Actual Victimization	.062	.063**	.010
Teacher Hostilities	.018	.013	.013
Peer Hostilities	-.002	-.001	.025
Control Variables			
Gender	.138	.057**	.024
Age	-.020	-.021*	.010
Race	.317	.073**	.040
Number of Times Moved	.060	.031**	.018
Opportunity to Obtain Alcohol	-.071	-.064**	.015
Opportunity to Obtain Tobacco	.102	.092**	.015
Opportunity to Obtain Marijuana	.120	.114**	.016
Opportunity to Obtain Drugs	-.127	-.098**	.018

Note: * $p < .05$ level ** $p < .01$ level R^2: .260

Of the social learning variables, delinquent peers is statistically significant in Table 3.9. As in previous models, these findings indicate that a youth's association with delinquent peers increases the probability that they will use tobacco products throughout the school year.

Five of the eight social bond variables wield statistical significance on the outcome. The level of attachment and commitment are statistically significant in predicting tobacco use among youths. Impulsivity is statistically significant. Actual victimization, which increases the amount of strain an individual will experience, is related to an increase in the use of tobacco products throughout the school year for youths.

EXPLAINED VARIATION

The explained variation for the models described above has a wide range of values. The outcome frequency of smoking has the lowest R^2 value of .016. This value simply indicates that there is little explained variation within the model. The model with the largest R^2 value is frequency of alcohol over time $(R^2= .299)$, that this outcome is explained the best as compared to the other outcomes.

Within the alcohol-related models, the outcome frequency of alcohol over time has the highest value of explained variation. Problem drinking has the least amount of explained variation with a R^2 value of .138. Frequency of marijuana use has the most explained variation of the drug-related models with a R^2 value of .230. There is substantially less explained variation in the outcome frequency of drug use. Among the tobacco-related models, frequency of tobacco use has the highest explained variation with a R^2 value of .260. There is little explained variation in the remaining two tobacco-related outcomes of frequency of smoking $(R^2= .016)$, and smoking dependency. $(R^2= .299)$,

Table 3.10 Explained Variation among Outcomes

Dependent Variable	R^2
Alcohol-Related Models	
Binge Drinking	.232
Frequency of Alcohol Use over Time	.299
Problem Drinking	.138
Problem Drinking over Time	.259
Drug-Related Models	
Frequency of Marijuana Use	.230
Frequency of Drug Use	.129
Tobacco-Related Models	
Frequency of Smoking	.016
Smoking Dependency	.022
Frequency of Tobacco Use	.260

GENDER

The following section will address three specific matters. First, the variables that are significant for males and females. Second, a comparison between males and females to assess whether there are significant predictive differences in the outcome among the two populations. To determine whether these differences are significant, a Clogg's z-test was performed for each variable (Clogg, Petkova, & Haritou, 1995). The test is of importance for this study as it will serve to clarify whether the theories of social learning, social bond, self-control, and general strain better predict substance use for male or female youths. Third, whether most of the variables affect males and females in the same way or differently. The focus of this section will not be on the control variables as the main interest is in the theoretical variables.

ALCOHOL-RELATED MODELS

Sources of Binge Drinking

Table 3.11 presents the results of binge drinking for males and females. Of the general strain variables, perceived risk of victimization has a positive effect for both males and females. Peer hostilities are significant for females, whereas peer hostilities are significant among males. Thus, within the model there are no variables that are significant for one gender group and not the other on this outcome. Overall, then, the findings indicate that the theoretical variables have general rather than gender-specific effects.

Sources of Frequency of Alcohol Use over Time

The results of the frequency of alcohol use over time for males and females are presented in Table 3.12. For the most part, the results indicate that the effects of the theoretical variables on this dependent variable are general and not gender-specific. First, delinquent peers is

positively and significantly related to alcohol use over time for both males and females. Second, of the social bond variables, direct supervision, attachment to peers, and attachment to school all significantly reduce drinking for both gender groups. Third, impulsivity, a measure of self-control, significantly increases drinking for both males and females. Fourth, perceived injustice and actual victimization are the two general strain measures that are significant predictors for both gender groups. These results signify that aversive or negative situations that produce high amounts of strain are likely to lead to alcohol use throughout the school year by both males and females.

With regard to significant differences between the gender groups, there are no variables that are significant for one gender group and not the other. A Clogg's z-test reveals that the difference of coefficients for males and females for delinquent peers is significant. The difference in coefficients for attachment to peers is significant. Overall, the findings reveal that the affects for males and females on drinking alcohol over time are the same. Thus, for the most part, the results are not gender-specific but are general.

Sources of Problem Drinking

Table 3.13 reveals the results of the source of problem drinking for males and females. Family use of tobacco and anti-social beliefs significantly increase problem drinking for males and females. Pro-social beliefs has a negative and significant effect on problem drinking for males and females. Of the general strain variables, perceived risk of victimization has a positive and significant effect on problem drinking for both males and females. Within the model, the use of tobacco at school is positively significant for males and not for females. The overall findings indicate, however, that the effects are general and not gender-specific.

104

Table 3.11 Sources of Binge Drinking – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peers	-.026(.056)	-.008	.026(.051)	.008	-.052	-.686
Family use of Tobacco	.193(.040)	.067**	.190(.034)	.073**	.003	.057
Use of Tobacco at School	.216(.064)	.047**	.196(.058)	.045**	.020	.231
Pro-Social Beliefs	-.457(.021)	.329**	-.408(.018)	-.318**	-.049	-1.771
Anti-Social Beliefs	.428(.027)	.233**	.373(.023)	.228	.055	1.550
Social Bond Variables						
Attachment to Parents	.020(.030)	-.013	.034(.027)	.025	-.036	-.891
Direct Supervision	.005(.024)	.004	-.042(.022)	-.037	.047	1.443
Attachment to Peers	.003(.025)	.002	-.067(.031)	.029*	.070	1.757
Attachment to School	.084(.036)	.042*	.046(.036)	.019	.038	.746
Student GPA	.027(.019)	.022	-.004(.019)	-.003	.031	1.153
Commitment to School	-.008(.014)	-.009	.027(.014)	.026	-.035	-1.767
Involvement in School Activities	-.001(.038)	-.001	.007(.034)	.003	-.008	-.156
Involvement in Community Activities	.002(.044)	.001	.023(.038)	.008	-.021	-.361
Self-Control Variables						
Impulsivity	.011(.026)	.006	-.009(.026)	-.006	.020	.543
General Strain Variables						
Perceived Injustice	.058(.031)	.032	.043(.029)	.024	.015	.353
Perceived Risk of Victimization	.100(.024)	.062**	.070(.020)	.048**	.030	.960
Actual Victimization	-.003(.013)	-.003	.003(.013)	.003	-.006	-.326
Teacher Hostilities	.017(.019)	.013	.049(.017)	.039**	-.032	-1.255
Peer Hostilities	-.086(.035)	-.035*	-.090(.031)	.039**	.004	.085
Control Variables						
Age	-.011(.014)	-.012	.001(.013)	.001	-.012	-.628
Race	-.119(.058)	-.029*	-.003(.050)	-.001	-.116	-1.514
Number of Times Moved	.007(.025)	.004	.031(.023)	.018	-.024	-.706
Opportunity to Obtain Alcohol	-.010(.021)	-.014	.024(.019)	.024	-.034	-1.200
Opportunity to Obtain Tobacco	-.034(.021)	-.013	.011(.019)	.011	-.045	-1.589
Opportunity to Obtain Marijuana	.058(.023)	.059**	.006(.021)	.007	.052	1.669
Opportunity to Obtain Drugs	-.035(.025)	-.028	-.057(.022)	-.050**	.022	.660

Note: * $p < .05$ level ** $p < .01$ level R^2: .247 (males) R^2: .223 (females)

Table 3.12 Sources of Frequency of Alcohol Use over Time – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peers	.835(.049)	.268**	.633(.042)	.222*	.202	3.129**
Family use of Tobacco	.026(.035)	.010	.017(.028)	.007	.009	.200
Use of Tobacco at School	-.089(.056)	-.022	-.032(.047)	-.009	.121	1.655
Pro-Social Beliefs	.006(.018)	.005	.006(.015)	.005	.000	.000
Anti-Social Beliefs	.010(.024)	.006	-.007(.019)	-.005	.017	.555
Social Bond Variables						
Attachment to Parents	.028(.026)	.020	.052(.022)	.043*	-.024	-.704
Direct Supervision	-.158(.021)	-.141**	-.180(.018)	-.181**	.022	.795
Attachment to Peers	.054(.022)	.035*	.123(.025)	.061**	-.069	-2.071*
Attachment to School	-.161(.031)	-.089**	-.109(.029)	-.059**	-.052	-1.224
Student GPA	-.012(.017)	-.011	-.057(.016)	-.051**	.045	1.927
Commitment to School	-.017(.012)	-.020	-.007(.012)	-.008	-.001	-.589
Involvement in School Activities	.011(.033)	.005	.005(.028)	.002	.006	.138
Involvement in Community Activities	.063(.038)	.023	.054(.031)	.021	.009	.183
Self-Control Variables						
Impulsivity	.104(.023)	.070**	.107(.021)	.074**	-.003	-.096
General Strain Variables						
Perceived Injustice	.096(.027)	.059**	.102(.023)	.066**	-.006	-.169
Perceived Risk of Victimization	-.029(.020)	-.020	.005(.016)	.004	-.034	-2.108*
Actual Victimization	.064(.012)	.081**	.077(.011)	.097**	-.013	-.798
Teacher Hostilities	.018(.016)	.016	.026(.014)	.025	-.008	-.376
Peer Hostilities	.048(.031)	.021	-.016(.025)	-.008	.064	1.607
Control Variables						
Age	.064(.012)	.078**	.055(.011)	.073**	.009	.0552
Race	.130(.050)	.035**	.031(.041)	.039**	.096	2.396*
Number of Times Moved	.007(.022)	.004	.030(.019)	.020	-.023	-.791
Opportunity to Obtain Alcohol	.071(.019)	.076**	.087(.016)	.100**	-.016	-.644
Opportunity to Obtain Tobacco	-.031(.018)	-.033	.020(.015)	.023	-.051	-2.176*
Opportunity to Obtain Marijuana	.114(.020)	.129**	.096(.017)	.117**	.018	1.051
Opportunity to Obtain Drugs	-.093(.022)	-.083**	-.115(.018)	-.115**	.022	.0773

Note: * $p < .05$ level ** $p < .01$ level R^2: .248 (males) R^2: .305 (females)

Sources of Problem Drinking over Time

Table 3.14 presents the results of problem drinking over time. For the most part, the results indicate that the effects of the theoretical variables on this dependent variable are general and not gender-specific. First, delinquent peers positively increases problem drinking over time for both males and females. Second, of the social bond variables, attachment to peers, attachment to school, direct supervision, and commitment to school have a negative and significant effect on both males and females. Third, impulsivity increases problem drinking over time for both males and females. Fourth, perceived injustice and actual victimization have a positive and significant effect for both males and females.

Student GPA has a negative and significant effect on females and not for males. The results of a Clogg's z-test show that the male and female coefficients for delinquent peers are significantly different from each other. The same can be said for the variable attachment to peers. While there are a few gender-specific results, overall, the results for this model are general.

DRUG-RELATED MODELS

Sources of Marijuana Use

The results of marijuana use are presented in Table 3.15. Delinquent peers increases marijuana use among both males and females. Of the social bond variables, direct supervision, attachment to school, student GPA, and commitment to school have a negative and significant effect on both males and females. Impulsivity, a measure of self-control, has a positive and significant effect for both males and females. Of the general strain variables, perceived injustice and actual victimization increases marijuana use for both males and females.

Table 3.13 Sources of Problem Drinking – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peers	-.098(.100)	-.031	.046(.090)	.015	-.144	-1.070
Family use of Tobacco	.124(.062)	.053*	.169(.054)	.078**	-.045	-.547
Use of Tobacco at School	.290(.092)	.084**	.050(.080)	.016	.240	1.968*
Pro-Social Beliefs	-.297(.037)	-.227**	-.224(.032)	-.184**	-.073	-1.492
Anti-Social Beliefs	.170(.043)	.111**	.247(.036)	.180**	-.077	-1.373
Social Bond Variables						
Attachment to Parents	-.049(.052)	-.035	-.025(.047)	-.020	-.024	-.342
Direct Supervision	-.015(.042)	-.013	.053(.039)	.051	-.068	-1.186
Attachment to Peers	-.031(.044)	-.020	-.011(.051)	-.006	-.020	-.296
Attachment to School	.059(.063)	.033	-.090(.064)	-.044	.149	1.695
Student GPA	-.025(.034)	-.022	-.016(.035)	-.013	-.041	-.840
Commitment to School	.026(.024)	.031	.027(.025)	.028	-.001	-.028
Involvement in School Activities	.007(.064)	.003	-.053(.057)	-.024	.060	.700
Involvement in Community Activities	-.016(.070)	-.006	-.035(.063)	-.014	.019	.201
Self-Control Variables						
Impulsivity	-.004(.045)	-.003	-.051(.044)	-.033	.047	.746
General Strain Variables						
Perceived Injustice	.027(.054)	.016	-.025(.050)	-.015	.052	.706
Perceived Risk of Victimization	.190(.039)	.135**	.208(.032)	.169**	.018	-.356
Actual Victimization	-.015(.024)	-.018	.048(.023)	.057*	-.063	-1.895
Teacher Hostilities	-.062(.030)	-.056*	.011(.027)	.011	-.073	-1.808
Peer Hostilities	-.012(.060)	-.006	-.128(.053)	-.061*	.116	1.448
Control Variables						
Age	.003(.025)	.004	.004(.023)	.004	-.001	-.029
Race	-.185(.096)	-.051	.173(.087)	.050*	-.358	-2.763**
Number of Times Moved	-.014(.042)	-.009	.026(.037)	.018	-.040	-.714
Opportunity to Obtain Alcohol	-.010(.037)	-.011	-.002(.033)	-.002	-.008	-.161
Opportunity to Obtain Tobacco	-.036(.037)	-.036	.015(.033)	.016	-.051	-1.028
Opportunity to Obtain Marijuana	.052(.040)	.059	.000(.039)	.000	.052	.930
Opportunity to Obtain Drugs	-.042(.042)	-.038	-.031(.039)	-.039	-.011	-.191

Note: * $p < .05$ level ** $p < .01$ level R^2: .149 (males) R^2: .148 (females)

108

Table 3.14 Sources of Problem Drinking over Time – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peers	.690(.045)	.245**	.534(.037)	.215**	.156	2.677**
Family use of Tobacco	.039(.032)	.017	.014(.025)	.007	.025	.615
Use of Tobacco at School	-.114(.051)	-.031*	-.020(.042)	-.006	-.094	-1.422
Pro-Social Beliefs	-.003(.017)	-.003	.013(.013)	.014	-.016	-.747
Anti-Social Beliefs	.017(.022)	.011	.012(.017)	.010	.005	.179
Social Bond Variables						
Attachment to Parents	.038(.024)	.035	.065(.020)	.063**	-.027	-.864
Direct Supervision	-.106(.019)	-.105**	-.146(.016)	-.169**	.040	1.610
Attachment to Peers	.051(.020)	.036*	.124(.023)	.070**	-.073	-2.395*
Attachment to School	-.136(.029)	-.083**	-.086(.026)	-.053**	-.050	-1.283
Student GPA	-.029(.016)	-.029	-.074(.014)	-.076**	.045	2.116*
Commitment to School	-.028(.011)	-.037*	-.037(.010)	-.047**	.009	.605
Involvement in School Activities	.026(.030)	.012	-.008(.025)	-.004	.034	.870
Involvement in Community Activities	.056(.035)	.022	.036(.028)	.016	.020	.446
Self-Control Variables						
Impulsivity	.093(.021)	.069**	.115(.019)	.091**	-.022	-.776
General Strain Variables						
Perceived Injustice	.085(.025)	.058**	.061(.021)	.046**	.024	.735
Perceived Risk of Victimization	-.031(.019)	-.024	.010(.014)	-.009	-.041	-1.737
Actual Victimization	.069(.011)	.096**	.052(.010)	.075**	.017	1.143
Teacher Hostilities	.016(.015)	.015	.024(.012)	.026*	-.008	-.416
Peer Hostilities	.030(.028)	.015	.021(.022)	.012	.009	.252
Control Variables						
Age	.076(.011)	.101**	.061(.010)	.093**	.015	1.009
Race	.062(.046)	.018	.110(.037)	.038**	-.048	-.813
Number of Times Moved	.013(.020)	.009	.035(.017)	.027*	-.022	-.838
Opportunity to Obtain Alcohol	.043(.017)	.050*	.062(.014)	.082**	-.019	-.862
Opportunity to Obtain Tobacco	-.032(.017)	-.037	-.020(.014)	-.026	-.012	-.544
Opportunity to Obtain Marijuana	.107(.018)	.134**	.093(.015)	.130**	.014	.597
Opportunity to Obtain Drugs	-.066(.020)	-.066**	-.099(.016)	-.114**	.033	1.288

Note: * $p < .05$ level ** $p < .01$ level R^2: .256 (males) R^2: .268 (females)

Thus, within the model there are no variables that are significant for one gender group and not the other on this outcome. However, the Clogg's z-test reveals that the male and female coefficients for delinquent peers are significantly different from each other. Still the overall pattern of the results indicates that the theoretical variables have general rather than gender-specific effects.

Sources of Drug Use

The results of the frequency of drug use among males and females are presented in Table 3.16. Delinquent peers has a positive and significant effect on both males and females. Impulsivity, a measure of self-control, increases drug use for both males and females. Actual victimization is the only strain variable that has a positive and significant effect on males and females.

Attachment to school has a negative and significant effect on females and not on males. The results of a Clogg's z-test show that this difference is significant. Overall, the findings reveal that the affects for males and females on drug use are the same. Thus, for the most part, the results are not gender-specific but are general.

TOBACCO-RELATED MODELS

Sources of Frequency of Smoking

Table 3.17 presents the results of frequency of smoking for males and females. Of the variables only one gender difference was detected. Thus, attachment to peers is positive and significant for males, but not for females. The Clogg's z-test indicated that this gender

110

difference was significant. Still, overall, the results of this model are general and not gender-specific.

Sources of Smoking Dependency

The results of the model smoking dependency are presented in Table 3.18. There are no significant findings for both males and females. The Clogg's z-test indicates that this difference between gender groups for the outcome actual victimization is significant. Overall, however, the findings for this model are general and not gender-specific.

Sources of Tobacco Use over Time

Table 3.19 presents the results of tobacco use over time.   For the most part, the results indicate that the effects of the theoretical variables on this dependent variable are general and not gender-specific. First, delinquent peers increases tobacco use over time among both males and females. Second, among the social bond variables, direct supervision, attachment to school, student GPA, and commitment to school decrease tobacco use over time for both males and females. Third, impulsivity is positive and significant for both males and females. Fourth, of the general strain variables, actual victimization increases tobacco use throughout the school year for males and females.

Within the model there is not a variable that is significant for one gender group and not the other. A Clogg's z-test reveals, however, that the difference in coefficients for males and females for the measure attachment to school is negative and significant. This effect is greater for males. The difference in coefficients for males and females for student GPA are negative and significant. This effect is greater for females. Overall, the results of this model are general rather than gender-specific.

111

Table 3.15 Sources of Frequency of Marijuana Use – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peers	.629(.047)	.214**	.376(.036)	.060**	.253	4.273**
Family use of Tobacco	.007(.034)	.003	.024(.023)	.013	-.017	-.414
Use of Tobacco at School	.059(.054)	.015	.033(.041)	.011	.026	.383
Pro-Social Beliefs	.011(.017)	.009	.006(.013)	.006	.005	.233
Anti-Social Beliefs	.005(.023)	.003	-.014(.016)	-.012	.019	.678
Social Bond Variables						
Attachment to Parents	.025(.026)	.019	.032(.019)	.032	-.007	-.217
Direct Supervision	-.130(.020)	-.123**	-.098(.016)	-.120**	-.032	-1.249
Attachment to Peers	.032(.021)	.022	.076(.022)	.046	-.044	-1.446
Attachment to School	-.084(.031)	-.049**	-.116(.025)	-.075**	-.032	.080
Student GPA	-.074(.016)	-.071**	-.080(.014)	-.086**	.006	.828
Commitment to School	-.028(.012)	-.036*	-.036(.010)	-.048**	.008	.512
Involvement in School Activities	-.007(.032)	-.003	.010(.024)	.006	.003	.075
Involvement in Community Activities	.025(.037)	.009	.019(.027)	.009	.006	-.130
Self-Control Variables						
Impulsivity	.087(.022)	.062**	.137(.018)	.115**	-.050	-1.758
General Strain Variables						
Perceived Injustice	.097(.026)	.063**	.044(.020)	.035*	.053	1.615
Perceived Risk of Victimization	-.024(.020)	-.017	-.004(.014)	-.004	-.020	-.819
Actual Victimization	.065(.011)	.087**	.039(.009)	.059**	.026	1.829
Teacher Hostilities	.025(.016)	.022	.034(.012)	.039**	-.009	-.450
Peer Hostilities	.043(.030)	.020	-.008(.022)	-.005	.051	1.370
Control Variables						
Age	.009(.012)	.011	.026(.009)	.042**	-.017	-1.133
Race	-.078(.049)	-.022	.075(.036)	.027*	-.153	-2.516*
Number of Times Moved	.010(.006)	.021	.025(.016)	.020	-.015	-.877
Opportunity to Obtain Alcohol	-.038(.018)	-.043*	-.038(.014)	-.053**	.000	.000
Opportunity to Obtain Tobacco	-.036(.018)	-.041*	-.040(.013)	-.055**	.004	.180
Opportunity to Obtain Marijuana	.201(.019)	.241**	.163(.015)	.242**	.038	1.569
Opportunity to Obtain Drugs	-.069(.021)	-.065**	-.087(.016)	-.105**	-.156	-5.908**

Note: * $p < .05$ level ** $p < .01$ level R^2: .243 (males) R^2: .223 (females)

Table 3.16 Sources of Frequency of Drug Use – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peer	.218(.023)	.163**	.071(.011)	.106**	.147	5.765**
Family use of Tobacco	.004(.016)	.003	-.005(.007)	-.009	.009	.515
Use of Tobacco at School	.014(.026)	.008	.014(.013)	.016	.000	.000
Pro-Social Beliefs	.006(.008)	.011	.007(.004)	.025	-.001	-.111
Anti-Social Beliefs	-.004(.011)	-.006	.004(.005)	.012	-.008	-.662
Social Bond Variables						
Attachment to Parents	.002(.012)	.004	.003(.006)	.011	-.001	-.074
Direct Supervision	-.016(.010)	-.034	-.014(.005)	-.061	-.002	-.178
Attachment to Peers	-.031(.010)	-.047**	-.001(.007)	-.001	-.032	-.316
Attachment to School	-.014(.015)	-.018	-.027(.008)	-.062**	.041	2.411*
Student GPA	.012(.008)	.062	-.013(.004)	-.048**	-.001	-.111
Commitment to School	-.008(.006)	-.024	-.005(.003)	-.024	-.003	-.447
Involvement in School Activities	.012(.015)	.012	-.002(.007)	-.003	-.010	-.604
Involvement in Community Activities	-.001(.018)	-.001	-.011(.008)	-.018	.010	.507
Self-Control Variables						
Impulsivity	.054(.010)	.085**	.032(.006)	.094**	.022	1.886
General Strain Variables						
Perceived Injustice	.011(.012)	.016	.005(.006)	.013	.006	.447
Perceived Risk of Victimization	-.014(.009)	-.023	-.003(.004)	-.009	-.011	-1.116
Actual Victimization	.080(.005)	.235**	.025(.003)	.136**	.055	9.432**
Teacher Hostilities	.012(.008)	.023	.005(.004)	.021	.007	.782
Peer Hostilities	.016(.014)	.017	-.007(.007)	-.015	.023	1.469
Control Variables						
Age	.000(.006)	.000	-.002(.003)	-.013	.002	.298
Race	-.042(.023)	-.027	.013(.011)	.017	-.055	- 2.157*
Number of Times Moved	-.001(.010)	-.002	-.009(.005)	-.026	.008	.715
Opportunity to Obtain Alcohol	.005(.009)	.013	.004(.004)	.017	.001	.101
Opportunity to Obtain Tobacco	-.032(.008)	-.080**	-.013(.004)	-.063**	-.045	-5.031**
Opportunity to Obtain Marijuana	-.015(.009)	-.040	-.007(.005)	-.039	-.008	-.777
Opportunity to Obtain Drugs	.071(.010)	.149**	.016(.005)	.068**	.055	4.919**

Note: * $p < .05$ level ** $p < .01$ level R^2: .166 (males) R^2: .102 (females)

Table 3.17 Sources of Frequency of Smoking – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peer	-.074(1.171)	-.003	1.264(1.221)	.054	1.388	.441
Family use of Tobacco	.933(.779)	.052	-.044(.797)	-.002	-1.891	-.916
Use of Tobacco at School	.2.067(1.179)	.096	-.125(1.445)	-.004	-1.715	-.492
Pro-Social Beliefs	-.315(.427)	-.035	-.127(.413	-.014	-.021	-.019
Anti-Social Beliefs	.564(.565)	.047	.204(.548)	.017	.347	.237
Social Bond Variables						
Attachment to Parents	-.621(.620)	-.063*	.123(.666)	.012	3.475	2.060*
Direct Supervision	.000(.508)	.000	-.757(.518)	-.093	.799	.592
Attachment to Peers	.491(.523)	.043	-.060(.794)	-.003	-1.493	-.861
Attachment to School	1.136(.756)	.085	.446(.866)	.029	-1.929	-.902
Student GPA	-.562(.392)	-.070	-.261(.470)	-.027	.827	.730
Commitment to School	-.168(.277)	-.028	.541(.344)	.069	-.662	-.806
Involvement in School Activities	-.793(.758)	-.046	.166(.779)	.009	-1.437	-.715
Involvement in Community Activities	.628(.895)	.031	-2.310(.965)	-.103	2.728	1.092
Self-Control Variables						
Impulsivity	-.545(.501)	-.053	-.342(.629)	-.028	.051	.034
General Strain Variables						
Perceived Injustice	.516(.640)	.043	-.001(.686)	.000	.001	.000
Perceived Risk of Victimization	-.533(.488)	-.049	-.656(.483)	-.053	.570	.450
Actual Victimization	.347(.260)	.061	-.517(312)	-.078	.346	.478
Teacher Hostilities	-.336(.392)	-.038	-.343(.415)	-.036	-.289	-.271
Peer Hostilities	-.801(.710)	-.049	-.904(.732)	-.055	-1.614	-.854
Control Variables						
Age	-.507(.286)	-.086	.041(.312)	.006	-1.436	-1.480
Race	-.928(1.206)	-.033	-.496(1.227)	-.018	-1.283	-.399
Number of Times Moved	-.614(.536)	-.050	.091(.478)	.008	.116	.088
Opportunity to Obtain Alcohol	-.001(.401)	.000	-.533(.443)	-.078*	-1.442	-1.30
Opportunity to Obtain Tobacco	-.096(.417)	-.015	.490(.449)	.069	-1.127	-.993
Opportunity to Obtain Marijuana	.102(.448)	.016	-.330(.518)	-.048	-1.943	-1.52
Opportunity to Obtain Drugs	-.716(.482)	-.090	.678(.538)	.083**	-4.725	-3.3**

Note: * $p < .05$ level ** $p < .01$ level R^2: .060 (males) R^2: .042 (females)

Table 3.18 Smoking Dependency – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peer	.162(.256)	.033	.288(.250)	.057	-.126	-.352
Family use of Tobacco	-.241(.168)	-.061	-.049(.164)	-.013	-.192	-.817
Use of Tobacco at School	-.542(.248)	-.093*	-.205(.303)	-.029	-.337	-.860
Pro-Social Beliefs	.062(.095)	.030	.038(.085)	.020	.024	.192
Anti-Social Beliefs	.026(.123)	.010	-.091(.113)	-.035	.117	.700
Social Bond Variables						
Attachment to Parents	.062(.133)	.028	.013(.137)	.006	.049	.256
Direct Supervision	.123(.109)	.069	.058(.107)	.033	.065	.425
Attachment to Peers	-.099(.114)	-.038	.204(.159)	.054	-.303	-1.548
Attachment to School	.049(.165)	-.101	-.009(.177)	-.003	.058	.239
Student GPA	.049(.086)	.027	.041(.096)	.020	.008	.062
Commitment to School	-.004(.061)	-.003	-.100(.071)	-.061	.096	1.025
Involvement in School Activities	.025(.164)	.007	-.202(.161)	-.053	.227	.987
Involvement in Community Activities	.059(.196)	.013	.274(.200)	.057	-.215	-.767
Self-Control Variables						
Impulsivity	-.064(.110)	-.028	-.063(.129)	-.024	-.001	-.005
General Strain Variables						
Perceived Injustice	.006(.139)	.002	-.237(.143)	-.085	.243	1.218
Perceived Risk of Victimization	.048(.105)	.020	.072(.099)	.032	-.024	-.166
Actual Victimization	-.108(.057)	-.084	.152(.064)	.106*	-.260	-3.033*
Teacher Hostilities	.019(.082)	.010	.041(.086)	.020	-.022	-.185
Peer Hostilities	.204(.154)	.056	.097(.150)	.028	.107	.497
Control Variables						
Age	.067(.062)	.052	-.084(.063)	.062	.151	1.170
Race	.153(.269)	.024	-.281(.253)	.047	.434	1.175
Number of Times Moved	.185(.123)	.063	-.154(.101)	.064	.339	2.130*
Opportunity to Obtain Alcohol	.034(.087)	-.023	.137(.091)	.090	-.103	-.818
Opportunity to Obtain Tobacco	-.015(.092)	-.010	-.039(.094)	-.026	.024	.182
Opportunity to Obtain Marijuana	-.090(.097)	-.064	.043(.105)	.029	-.133	-.930
Opportunity to Obtain Drugs	.328(.103)	.189**	-.104(.109)	-.059	.432	2.880

Note: * $p < .05$ level ** $p < .01$ level R^2: .060 (males) R^2: .046 (females)

Table 3.19 Sources of Tobacco Use over Time – Males and Females

Variable	Males		Females			
	b	β	b	β	d	d/s(d)
Social Learning Variables						
Delinquent Peer	.897(.058)	.242**	.814(.056)	.219**	.083	1.029
Family use of Tobacco	.014(.041)	.005	.036(.037)	.012	-.022	-.398
Use of Tobacco at School	.086(.066)	.018	.007(.063)	.002	.079	.865
Pro-Social Beliefs	.006(.021)	.004	-.009(.019)	-.006	.015	.529
Anti-Social Beliefs	-.007(.028)	-.004	.000(.025)	.000	-.007	-.186
Social Bond Variables						
Attachment to Parents	-.013(.031)	-.008	-.037(.029)	-.024	.024	.565
Direct Supervision	-.079(.025)	.061**	-.107(.024)	-.083**	.028	.807
Attachment to Peers	.025(.026)	.014	.099(.034)	.037	-.074	-1.728
Attachment to School	-.251(.037)	-.119**	-.120(.039)	-.050**	-.131	-2.436**
Student GPA	-.140(.020)	-.109**	-.216(.021)	-.148**	.076	2.620**
Commitment to School	-.067(.014)	-.069**	-.065(.016)	-.055**	-.002	-.094
Involvement in School Activities	.022(.039)	.008	.032(.037)	.011	-.010	-.186
Involvement in Community Activities	.048(.045)	.015	.019(.042)	.006	.029	.471
Self-Control Variables						
Impulsivity	.125(.027)	.072**	.196(.028)	.104**	-.071	1.825
General Strain Variables						
Perceived Injustice	.024(.032)	.012	.068(.031)	.034*	-.044	-.098
Perceived Risk of Victimization	-.001(.024)	.000	-.033(.022)	-.020	.032	.982
Actual Victimization	.071(.014)	.077**	.047(.014)	.045**	.024	1.212
Teacher Hostilities	.025(.019)	.018	.011(.018)	.008	.014	.059
Peer Hostilities	-.006(.036)	-.002	.002(.034)	.001	-.008	-.161
Control Variables						
Age	-.030(.015)	-.031*	-.010(.014)	-.010	-.020	-.974
Race	.252(.060)	.058**	.375(.055)	.087**	-.123	-1.511
Number of Times Moved	.047(.026)	.024	.071(.025)	.036**	-.024	-.665
Opportunity to Obtain Alcohol	-.079(.022)	-.073**	-.059(.021)	-.052**	-.020	-.657
Opportunity to Obtain Tobacco	.103(.022)	.095**	.100(.021)	.088**	.002	.098
Opportunity to Obtain Marijuana	.108(.023)	.104**	.131(.022)	.123**	-.023	-.722
Opportunity to Obtain Drugs	-.109(.026)	-.084**	-.144(.024)	-.111**	.035	.989

Note: * $p < .05$ level ** $p < .01$ level R^2: .245 (males) R^2: .269 (females)

Chapter 4

DISCUSSION

In *Causes of Delinquency*, Travis Hirschi (1969) first defined three major theoretical traditions in criminology: cultural deviance (which included differential association and later social learning theory), strain theory and control theory. He then asserted that these perspectives had incompatible underlying assumptions and thus could not be integrated into a single framework. Instead, he argued that they should be considered rival theories that should be tested against one another. This empirical combat should result in on theory being dominant—in his view, control theory. The alternative view, however, is that no one theory fully explains criminal involvement and thus that each of these rivals might help to illuminate the causes of wayward conduct. Prior test of the three major traditions seem to support this latter view.

In this tradition, the current dissertation seeks to advance knowledge by testing the relative ability of the three rival traditions to explain substance use. The key advantage of this assessment is that it includes within a single analysis detailed measures of differential association/social learning theory, general strain theory, and control theory (including both social bond and self-control theory). Further, it explores the theories across multiple outcome measures. Accordingly, this investigation provides perhaps the most systematic test of the rival theories in the area of substance use.

Hirschi (1969) and other scholars (Agnew, 2006; Akers, 1979; Merton, 1938) have claimed that their models are general theories, explaining multiple forms of crime and deviance. They also assert that their theories apply to all demographic groups, including males and females. The last contention is controversial because feminist critics have argued that the causes

of crime, including substance use, are not general but gender specific. The data used in this dissertation allowed for an assessment of this debate.

Thus, this chapter provides an overview of the general results of the theoretical perspectives of social learning theory, social bond theory, self-control theory, and general strain theory. The section will then provide an overview of the gender analysis of each perspective. The purpose of this was to see if the theoretical perspectives had any gender-specific effects.

The chapter will then move into a discussion on whether the theories of social learning, social bond, self-control, and general strain theory possess the relative merits to be considered rival theories. Beyond that, this section will conclude with an overview of the limitations of the study along with recommendations for future research.

SOCIAL LEARNING THEORY

The differential association/social learning perspective argues that delinquent acts, including various forms of substance use, are due to learning. As a result, the theory would predict that youths who associate with others who engage in substance use or otherwise positively view such behavior should have higher levels of this conduct. The theory also claims that through differential associations youths who use substance should be more likely than others to internalize attitudes or cognitions that define substance as values or permissible.

Table 4.1 summarizes the results for the measures of social learning theory included in this dissertation across the nine outcomes. Statistically significant results are indicated by the label of "Yes"; the direction of the effect is indicated in the parentheses. For the theory to be strongly supported, it would be expected that each measure would have consistently significant results across the outcomes. Further, it would be expected that theory would be equally related to each

118

outcome. As can be seen from Table 4.1, there is support for social learning theory. However, the results are inconsistent rather than uniform.

Despite the lack of uniformity among the results, there is a clear pattern that emerges. All of the measures with the exception of delinquent peers have the most consistent effects for binge drinking and problem drinking. Family use of tobacco, tobacco use at school, pro-social beliefs, and anti-social beliefs all consistently explain binge drinking among youths as well as problem drinking. It is clear by these results that social learning theory explains alcohol-related outcomes better than the drug-related or tobacco-related ones. Social learning theory explains non-serious alcohol use in binge drinking. At the same time, it explains serious alcohol use among youths with consistent effects for problem drinking.

Delinquent peers shows consistent effects for five of the nine outcomes. Support can be found among alcohol-related outcomes, both drug-related outcomes, and one of the tobacco-related outcomes. These findings indicate that delinquent peers can explain serious substance use as well as non-serious substance use. Across all the outcomes, delinquent peers seems to show the strongest support for substance use among youths.

The association with peers who engage in deviant behavior is one of the strongest tenets of social learning theory (Akers et al. 1979; Krohn et al. 1985; Baker 2010). Thus, it is not surprising that delinquent peers has reliable support across the outcomes. These results are consistent with the idea that a youth who associate with others who engage in substance use (non-serious or serious) are more likely to participate as well.

According to social learning theory, criminal or deviant family and friends increase the likelihood of the youth engaging in deviant behavior. It should come as no surprise then that family use of tobacco and use of tobacco at school are two measures that consistently support

119

binge drinking and problem drinking. The direct interaction with others who engage in deviant

behavior provides an intimate communication where the deviant behavior can then be learned

and imitated. This process most likely explains binge drinking, which can often be the first time

a youth drinks. The reinforcement the youth will receive from their friends and family for their

deviant behavior will only increase the likelihood that they will continue to engage in deviant

acts, which may explain the support for problem drinking.

Definitions help one determine whether an act is more right or wrong. These include those

learned from norms and values favorable or unfavorable to crime. Cognitively, a lack of pro-

social beliefs and the presence of anti-social beliefs provide a mind-set that can make a youth

more willing to engage in substance use. The internalization of these attitudes may make it easier

for a youth to rationalize his or her attitudes about alcohol use, which in turn may facilitate the

use of it.

SOCIAL BOND THEORY

Hirschi's (1990) social bond theory contends that delinquent behavior happens when the

tools that prevent such behavior are not working correctly. Thus, youths who possess these weak

bonds with society are more likely to engage in criminal behavior (Lagrange & White, 1985)

More relevant to the current project, youngsters will engage substance use when their social

bonds are weak or broken. Four specific elements comprise to these bonds: attachment to others,

commitment to conventional lines of action, involvement in conventional activities, and belief in

conventional values (Greenberg, 1999).   The stronger each element of the social bond, the less

likely the individual will engage in deviant behavior (Wiatrowski et al., 1981).

As can be seen from Table 4.2, there is support for social bond theory. However, the results are inconsistent rather than uniform. Still, some empirical patterns can be discerned. The social bonds of attachment and commitment show consistent effects across the alcohol-related models, the drug-related models, and the tobacco-related models. Attachment to parents, direct supervision, attachment to school, and attachment to peers all explain substance use among youths. Student GPA and commitment to school consistently explain substance use among adolescents across most of the outcomes. Measures for both attachment and commitment explain the non-serious outcomes better than the serious ones.

One finding that is of interest is that direct supervision shows effects across more outcomes (5) than attachment to parents (3). This finding might indicate that the physical presence of the parents for direct supervision is more effective than the strength of ties between the child and parent (Wiatrowski et al., 1981). Direct control is exemplified in the correction or punishment of misbehavior. This may have a stronger effect than youths who only have the indirect control of attachment which is only effective when a youth strongly cares about the opinions and expectations of his or her parents. It is also possible that as youngsters move into high school, parental bonds weaken in their hold over them. If parents are going to exert control, it thus might be more likely through close supervision of their adolescent offspring.

Commitment exemplifies the costs involved in engaging in deviant behavior, which may explain the consistent results across multiple outcomes. Youths who are excelling in school and have a bright future may be less likely to engage in substance use, which will clearly put their future at risk. In other words, it is their stake in conformity that will make them less likely to

engage in behavior such as substance use. To do so would endanger the personal investment the youths had in participating in convention activities such as school.

SELF-CONTROL THEORY

Gottfredson and Hirschi (1990) propose that criminality is an unchangeable element in individuals. Criminality is established early in life and will exhibit itself again later in life. Criminality stems from a state labeled low self-control and individual differences of self-control are held to account for deviant behavior varies. A major characteristic of individuals with low self-control is the need to respond to tangible stimuli within their direct environment. Deviant acts, which provide immediate gratification, fulfill this need. Gottfredson and Hirschi (1990) use the term low self-control to explain criminal propensity that increases the probability that individuals will be unable to resist the easy, immediate gratification provided by crime, or by behaviors "analogous" to crime. Relevant to the current project, such analogous acts that can produce immediate gratification include substance use, including drinking, taking drugs, and smoking.

Table 4.4 shows consistent effects for self-control theory across five of the nine outcomes. The theory explains outcomes among the alcohol-related models, drug-related models, and tobacco-related models. Beyond that, the theory explains both non-serious and serious substance use among youths.

Low self-control can be seen as the universal propensity to engage in acts that provide instant gratification. Again, substance use would provide such gratification, regardless of whether this use was minor or serious. Phrased differently, the presence of self-control appears to enable youths to resist the use of alcohol, drugs, and tobacco.

122

It should be noted, however, that self-control did not fully eliminate the effects of social

bonds. In effect, Gottfredson and Hirschi (1990) argued that self-control would render spurious

the effects of sociological conditions—including social bonds—as youngsters moved beyond

childhood, where internal control was inculcated, and into adolescence. By contrast, the current

analyses suggest that both forms of control—self and social—exert a restraining influence on the

substance use for juveniles.

GENERAL STRAIN THEORY

Building upon his 1985 work and the work of Merton (1938) Agnew introduced

his general strain theory in 1992. Agnew's proposed strain of the gap between just/fair outcomes

and actual outcomes, which examines the role of equity and justice is relevant to this study.

Although individuals may realize that their expectations and aspirations may not always be

congruent, they will still have a reasonable expectation that the outcome will be fair and equal

among everyone. These individuals will experience strain when they begin to feel as though

they are being treated unfairly. Also relevant is the strain put forward by Agnew (1992) of the

presentation of negative or noxious stimuli. This occurs when an individual is presented with a

noxious or aversive stimulus. This is similar to Agnew's (1985) blockage of pain-avoidance

behavior where he explained how youths who were presented with a negative stimulus (an

aversive school, or punitive parents), would be presented with high amounts of strain.

As can be seen from Table 4.4, there is support for general strain theory. However, the

results are inconsistent rather than uniform. Regardless of a lack of uniformity there is a clear

pattern for general strain theory. Actual victimization has consistent effects five of the nine

outcomes. It supported among the serious and non-serious outcomes as well. Perceived

victimization has effects for four of the nine outcomes and explains serious and non-serious substance use. The measure teacher hostilities has support in four of the nine outcomes. It explains both serious and non-serious crime.

Strain that is high in magnitude is very difficult for an individual to cope with. It is often long in duration, frequent, very recent, and attacks the core values of the individual. Thus, this often taxes the coping ability of the individual and makes it more difficult for them to effectively cope in a non-criminal manner (Agnew, 2006). Youths who are presented with noxious and aversive stimuli such as victimization and hostile teachers will experience high amounts of strain. Youths that feel they have been presented with an unfair or unjust outcome will encounter strain that is high in magnitude. This strain will then make it more likely that those youths will engage in substance use. Thus, the response, or coping mechanism, for youths who encounter strain may be to engage in drinking, drugs, and use tobacco.

CONTROL VARIABLES

Table 4.6 presents the results of the control variables. While the results are not uniform, they are consistent. The opportunity measures have the most consistent effects across all the outcomes. Opportunity to obtain alcohol is supported in six of the nine outcomes. Opportunity to obtain marijuana is supported in five of the nine outcomes. Opportunity to obtain tobacco and alcohol have effects for four of the nine outcomes. Beyond opportunity, the measures of age and gender have consistent support across four of the outcomes. All of the control measures have consistent effects for both non-serious and serious substance use. The outcome tobacco use over time had significant effects for every measure. It is clear that access to alcohol, drugs, and

124

tobacco products contribute to substance use by adolescents. If adolescents are not able to obtain the contraband itself, then the use of it would not occur.

GENERAL VERSUS GENDER SPECIFIC THEORIES

The overall assertion of social learning theory, social bond theory, self-control theory, and general strain theory is that they explain every aspect of youths' social interaction and daily lives. Beyond this, the claim is that these theories explain phenomena such as crime for both males and females (Agnew, 2006; Akers, 1979; Hirschi, 1969; Merton, 1938). The controversy surrounding this claim is that some scholars argue that the causes of crime are not general but different among gender groups. This dissertation was able to address this debate.

The results of the analysis are presented in Table 4.6. The term "SD" indicates that the difference between males and females for an outcome is significant. The term "BS" signifies significance for both males and females; however, the difference is not significant.

Overall, the outcome of the gender analysis is that the theories mainly operated as general theories. Too few results were gender-specific to say otherwise. Thus, when statistically significant effects were found, they tended to obtain for both males and females. Notably, meta-analyses of the predictors of criminal involvement tend to show that such factors operated similarly across gender groups (Andrews and Bonta, 2010).

Even though the theories do not explain gender-specific effects on substance use, it does not mean that there are not gender specific causes of crime. Explanations of sexual abuse or domestic violence may operate differently by gender. When it comes to explaining substance use among youths, however, social learning, social bond, self-control, and general strain theories tend to operate similarly for both males and females.

RIVAL OR COMPLEMENTARY THEORIES

In Causes of Delinquency, Hirschi (1969) was not simply trying to identify another control theory. Instead, he was attempting to challenge the two major theories of that day: Sutherland's (1947) differential association theory and Merton's (1938) strain theory. Hirschi's ultimate goal was to start a theoretical debate. His main argument was that theories should be pitted against each other rather than be integrated or complementary. Through the process of competition, Hirschi argued that knowledge about the causes of crime would continue to grow.

This dissertation examines the issue of rival theories. The overall purpose was to see which general theory explained substance use among youths the best. The results revealed that no one theory supported the nine outcomes uniformly where the others had not. No one theory had more support than other theories across the outcomes. The results revealed clear patterns of support across the nine outcomes for each specific theory. It is clear that social learning theory, social bond theory, self-control theory, and general strain theory all identify importance sources of substance use among youths. Thus, the position to take may be that these major theories are complementary theories that all contribute to explaining the causes of crime. Rather than treating each theory as mutually exclusive, it may be more beneficial view these mainstream theories as complementary theories.

The models in this dissertation did not explain a great deal of variation. This is typical in most studies that include multiple theories. Estimates of explanatory power are important in that they can provide some information as to the causal mechanisms and processes (Weisburd & Piquero, 2008). If models have relatively low explained variation, one can only assume that an important measure was not included. Missing or omitted variables are common among

multivariate tests as it is often difficult to include every measure for every theory (Weisburd & Piquero, 2008). Thus, while each theory is valuable, the theories together are not a complete explanation of substance use.

FUTURE RESEARCH

Although this dissertation has provided useful data on the sources of adolescent substance use, further research could advance this work in three specific ways. First, it is important to note that this dissertation includes measures for four different theories. For three of these theories, multiple measures were used. However, even with the use of multiple measures, this dissertation cannot provide a complete test of each theory. By contrast, Akers et al. (1979), which tested whether the components of social learning could predict alcohol and marijuana use among youths. In this study, a complete test of social learning required Akers et al. to use 16 measures of social learning. Importantly, by assessing virtually all aspects of the perspective, their models were able to explain a substantial part of the variation in substance use. The low explained variation in most tests (Weisburd and Piquero, 2008) may not be due to theoretical weakness but in the failure of data sets to allow for complete tests of all components of the theories. This indicates that future research on substance use may need to include far more comprehensive tests of all the dimensions of each theory.

Second, differential association/social learning, social bond, self-control, and general strain have all been at the core of criminology (Lilly et al., 2007). However, the constant generation of knowledge through scholarship continually advances our understanding of the causes of crime. Thus, it is clear that any complete explanation of crime will have to include factors that are not components of the mainstream theories used in this dissertation. Biological factors comprise one

obvious omission—especially biological influences that start to affect behavior in childhood and set adolescents on criminal trajectories (Moffit, Lynam, & Silva, 1994).

Third, it is clear that more work needs to be done on factors that might be gender-specific. This dissertation reflects the important finding that the mainstream theories have general effects in predicting adolescent substance use. However, this does not mean that other factors outside of the theory do not have differential effects. One of these might be the effect of early sexual victimization, especially if it leads to young girls running away from home and take up a life on the street (Chesney-Lind, 2003).

CONCLUSION

The purpose of this dissertation was to unravel the sources of adolescents' use of alcohol, drugs, and tobacco. Toward this end, and attempt was made in a single study to assess the explanatory power of the major traditional theories of crime. The analysis revealed that differential association/social learning theory, social bond theory, self-control theory, and general strain theory all contributed to an understanding of adolescent substance use. Accordingly, it is no longer productive to consider these perspectives as theoretical rivals in which, after empirical battle, only one would be left standing. Rather, it appears that it is more beneficial to see the field's major paradigms as complementary theories that, when taken together, offer a more complete understanding of the origins of substance use among adolescents.

Table 4.1 Summary of Social Learning Results

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Delinquent Peers	No	Yes (+)	No	Yes (+)	Yes (+)	Yes (+)	No	No	Yes (+)
Family Use of Tobacco	Yes (+)	No	Yes (+)	No	No	No	No	No	No
Use of Tobacco at School	Yes (+)	No	Yes (+)	No	No	No	No	Yes (-)	No
Pro-Social Beliefs	Yes (-)	No	Yes (-)	No	No	No	No	No	No
Anti-Social Beliefs	Yes (+)	No	Yes (+)	No	No	No	No	No	No

129

Table 4.2 Summary of Social Bond Results

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Attachment to Parents	No	Yes (+)	No	Yes (+)	Yes (+)	No	No	No	No
Direct Supervision	No	Yes (-)	No	Yes (-)	Yes (-)	Yes (-)	No	No	Yes (-)
Attachment to Peers	No	Yes (+)	No	Yes (+)	Yes (+)	Yes (-)	No	No	Yes (+)
Attachment to School	Yes (+)	Yes (-)	No	Yes (-)	Yes (-)	Yes (-)	No	No	Yes (-)
Student GPA	No	Yes (-)	No	Yes (-)	Yes (-)	No	No	No	Yes (-)
Commitment to School	No	No	No	Yes (-)	Yes (-)	No	No	No	Yes (-)
Involv in School Act	No	No	No	No	No	No	No	No	No
Involv in Comm Act	No	Yes (+)	No	Yes (+)	No	No	No	No	No

Table 4.3 Summary of Self-Control Results

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Impulsivity	No	Yes (+)	No	Yes (+)	Yes (+)	Yes (+)	No	No	Yes (+)

131

Table 4.4 Summary of General Strain Results

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Perceived Injustice	Yes (+)	Yes (+)	No	Yes (+)	Yes (+)	No	No	No	No
Perceived Risk of Vic	Yes (+)	No	Yes (+)	No	No	No	No	No	No
Actual Victimization	No	Yes (+)	No	Yes (+)	Yes (+)	Yes (+)	No	No	Yes (+)
Teacher Hostilities	Yes (+)	Yes (+)	No	Yes (+)	Yes (+)	No	No	No	No
Peer Hostilities	Yes (-)	No	No	No	No	No	No	No	No

132

Table 4.5 Summary of Control Variable Results

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Gender	Yes (-)	No	No	No	Yes (-)	Yes (-)	No	No	Yes (+)
Age	No	Yes (+)	No	Yes (+)	Yes (+)	No	No	No	Yes (-)
Race	No	Yes (+)	No	Yes (+)	No	No	No	No	Yes (+)
Num of Times Moved	No	No	No	No	No	No	No	No	Yes (+)
Opp to Obtain Alcohol	No	Yes (+)	No	Yes (+)	Yes (-)	No	No	No	Yes (-)
Opp to Obtain Tobacco	No	No	No	Yes (-)	Yes (-)	Yes (-)	No	No	Yes (+)
Opp to Obtain Marijuana	No	Yes (+)	No	Yes (+)	Yes (+)	Yes (-)	No	No	Yes (+)
Opp to Obtain Drugs	Yes (+)	Yes (-)	No	Yes (-)	Yes (-)	Yes (+)	No	No	Yes (-)

133

Table 4.6 Summary of Results—Males and Females

Variables	Binge Drink	Freq Alc Use	Prob Drink	Prob Drink Over Time	Marij Use	Drug Use	Freq Smoke	Smoking Dependency	Tobacco Use Over Time
Social Learning Variables									
Delinquent Peer	BS	SD		SD	SD	SD			BS
Family use of Tobacco	BS		BS						
Use of Tobacco at School	BS		SD						
Pro-Social Beliefs	BS		BS						
Anti-Social Beliefs	BS		BS						
Social Bond Variables									
Attachment to Parents							SD		
Direct Supervision		BS		BS	BS				BS
Attachment to Peers		BS		SD					
Attachment to School		SD		BS	BS	SD			BS
Student GPA				SD	BS				BS
Commitment to School				BS	BS				BS
Involv in School Act									
Involv in Comm Act									
Self-Control Variables									
Impulsivity		BS		BS	BS	BS			BS
General Strain Variables									
Perceived Injustice		BS		BS	BS				
Perceived Risk of Vict	BS								
Actual Victimization		BS	BS	BS	BS	SD			BS
Teacher Hostilities									
Peer Hostilities	BS								

134

REFERENCES

Agnew, R. (1985). A revised strain theory of delinquency. *Social Forces, 64*, 151-167.

Agnew, R. (1991). A longitudinal test of social control theory and delinquency. *Journal of Research in Crime and Delinquency, 28*, 126-156.

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology, 30*, 47-87.

Agnew, R. (2001). Building on the foundation for general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. *Journal of Research and Crime and Delinquency, 38*, 319-361.

Agnew, R. (2006). General strain theory: Current status and directions for further research. In F. T. Cullen J. P. Wright K. Blevins (Ed.), *Taking Stock: The Status of Criminological Theory (*Vol. 15, pp. 101-123). New Brunswick, NJ: Transaction Publishers.

Agnew, R., & White, H. R. (1992). An empirical test of general strain theory. *Criminology, 30*, 475-499.

Akers, R. L. (1991). Rational choice, deterrence, and social learning theory in criminology: the path not taken. *The Journal of Criminal Law and Criminology, 81*, 653-676.

Akers, R. L. (1996). Is differential association/social learning theory a cultural deviance theory? *Criminology, 34*, 229-247.

Akers, R. L. (1998). Social learning and social structure: Reply to Sampson, Morash, and Krohn. *Symposium on Social Learning and Social Structure,,* 477-493.

Akers, R. L. (2001). Social learning theory. In R. Paternoster R. Bachman (Ed.), *Explaining criminals and crime* (1st ed., pp. 192-210). Los Angeles, CA: Roxbury Publishing.

Akers, R. L. (2003). A social learning theory of crime. In F. T. Cullen R. Agnew (Ed.), *Criminological theory: Past and present* (2nd ed., pp. 142-154). Los Angeles, CA: Roxbury Publishing Company.

Akers, R. L. (2006). The empirical status of social learning theory of crime and deviance: The past, present, and future. In F. T. Cullen J. P. Wright K. Blevins (Ed.), *Taking Stock: The Status of Criminological Theory (*Vol. 15, pp. 37-76). New Brunswick, NJ: Transactions Publishing.

Akers, R. L., & Gang, L. (1996). A Longitudinal test of social learning theory: Adolescent smoking. *Journal of Drug Issues, 26*, 317-344.

Akers, R. L., & Gang, L. (1999). Age, social learning, and social bonding in adolescent substance use. *Deviant Behavior: An Interdisciplinary Journal, 19*, 1-25.

Akers, R. L., Krohn, M. D., Lanza-Kaduce, L., & Rodosevich, M. (1979). Social learning and deviant behavior: A specific test of a general theory. *Sociological Review, 44*, 636-655.

Alarid, L. F., Burton, V. S., & Cullen, F. T. (2000). Gender and crime among felony offenders: Assessing the generality of social control and differential association theories. *Journal of Research in Crime and Delinquency, 37*, 171-199.

Anthony, J. C., & Petronis, K. R. (1995). Early-onset drug use and risk of later drug problems. *Drug and Alcohol Dependence, 40*, 9-15.

Arata, C. M., Stafford, J., & Tims, M. S. (2003). High school drinking and its consequences. *Adolescence, 38*, 567-579.

Aseltine, R. H., Gore, S., & Gordon, J. (2000). Life stress, anger and anxiety, and delinquency: An empirical test of general strain theory. *Journal of Health and Social Behavior, 41*, 256-275.

Bachman, J. G., Johnston, L. D., & O'Malley, P. M. (1981). Smoking, drinking, and drug use among American high school students: Correlates and trends 1975-1979. *American Journal of Public Health, 71*, 59-69.

Bachman, J. G., Johnston, L. D., O'Malley, P. M., & Humphrey, R. H. (1986). Changes in marijuana use linked to changes in perceived risks and disapproval. *Institute for Social Research: The University of Michigan,,* 1-23.

Bachman, J. G., Wallace, J. M., O'Malley, P. M., Johnston, L. D., Kurth, C. L., & Neighbors, H. W. (1991). Racial/Ethnic differences in smoking, drinking and illicit drug use among American high school seniors 1976-1989. *American Journal of Public Health, 81*, 372-377.

Baker, J. O. (2010). The expression of low self-control as problematic drinking in adolescents: An integrated control perspective. *Journal of Criminal Justice , 38*, 237-244.

Bandura, A. (1979). The social learning perspective: Mechanisms of aggression. In H. Toch (Ed.), *Psychology of Crime and Criminal Justice (*pp. 198-236). New York, NY: Holt, Reinhart, and Winston.

Baron, S. W. (2003). Self-control, social consequences and criminal behavior: Street youth and the general theory of crime. *Journal of Research in Crime and Delinquency, 40*, 403-425.

Booth, J. A., Farell, A., & Varano, S. P. (2008). Social control, serious delinquency, and risky behavior: A gendered analysis. *Crime and Delinquency, 54*, 423-456.

Brauer, J. R. (2009). Testing social learning theory using reinforcement's residue: A multilevel analysis of self-reported theft and marijuana use in the national youth survey. *Criminology, 47*, 929-970.

Briar, S., & Piliavin, I. (1965). Delinquency, situational inducements, and commitment to conformity. *Social Problems, 13*, 35-45.

Burgess, R. L., & Akers, R. L. (1966). A differential association-reinforcement theory of criminal behavior. *Social Problems, 14*, 128-147.

Carson, D. C., Sullivan, C. J., Cochran, J. K., & Lersch, K. M. (2009). General strain theory and the relationship between early victimization and drug use. *Deviant Behavior, 30*, 54-88.

Chassin, L. (2008). Juvenile justice and substance abuse. *Juvenile Justice, 18*, 165-183.

Chassin, L., Pitts, S. C., & Prost, J. (2002). Binge drinking trajectories from adolescence to emerging adulthood in a high risk sample: Predictors and substance abuse outcomes. *Journal of Consulting and Clinical Psychology, 70*, 67-78.

Cheever, A., & Weiss, J. (2009). Alcohol use among adolescents. *California Journal of Health Promotion, 7*, 86-98.

Chesney-Lind M. (2003). A feminist theory of female delinquency. In F. T. Cullen R. Agnew (Ed.), *Criminological Theory: Past to Present.* 2nd ed. (pp. 423-429)

Clogg C C Petkova E Haritou A 1995 Statistical methods for comparing regression coefficients between models. *The American Journal of Sociology,* 100, 1261-1293.

Cloward, R. (1959). Illegitimate means, anomie, and deviant behavior. *American Sociological Review, 24*, 164-176.

Cloward, R. A., & Ohlin, L. (1960). *Delinquency and opportunity: A theory of delinquent gangs* (1st ed.). New York, NY: New York Free Press.

Cooper, K., May, D., Soderstrom, I., & Jarjoura, G. R. (2009). Examining theoretical predictors of substance use among a sample of incarcerated youth. *Journal of Offender Rehabilitation, 48*, 669-695.

Costello, B. (1997). On the logical adequacy of cultural deviance theories. *Theoretical Criminology, 1*, 403-428.

Costello, B. J., Anderson, B. J., & Stein, M. D. (2006). Heavy episodic drinking among adolescents: A test of hypotheses derived from control theory. *Journal of Alcohol Drug Education, 50*, 35-55.

Cullen, F. T. (1994). Social support as an organizing concept for criminology: Presidential Address to the Academy of Criminal Justice Sciences. *Justice Quarterly, 11*, 427-459.

Cullen, F. T., Unnever, J. D., Hartman, J. L., Turner, M. G., & Agnew, R. (2008). Gender, bullying, victimization, and juvenile delinquency: A test of general strain theory. *Victims and Offenders, 3*, 331-349.

Cullen, F. T., Unnever, J. D., Wright, J. P., & Beaver, K. M. (2008). Parenting and self-control. In E. Goode (Ed.), *Out of control: Assessing the general theory of crime* (1st ed., pp. 61-74). Stanford, CA: Stanford University Press.

Danielsson, A., Wennberg, P., Tengstrom, A., & Romelsjo, A. (2010). Adolescent alcohol use trajectories: Predictors and subsequent problems. *Addictive Behaviors, 35*, 848-852.

De Coster, S., & Zito, R. C. (2010). Gender and general strain theory: the gendering of emotional experiences and expressions. *Journal of Contemporary Criminal Justice, 26*, 224-245.

Duncan, S. C., Alpert, A., Duncan, T. E., & Hops, H. (1997). Adolescent alcohol use development and young adult outcomes. *Drug and Alcohol Dependence, 49*, 39-48.

Evans, T. D., Cullen, F. T., Burton, V. S., Dunaway, R. G., & Benson, M. L. (1997). The social consequences of self-control: Testing the general theory of crime. *Criminology, 35*, 475-504.

Gang, L., Akers, R. L., & Borg, M. J. (2004). Social learning and structural forces in adolescent substance use. *Western Criminology Review, 5*, 17-34.

Getz, T. D., & Bray, J. H. (2005). Predicting heavy alcohol use among adolescents. *American Journal of Orthopsychiatry, 75*, 102-116.

Gibbs, J. J., & Giever, D. (1995). Self-control and its manifestations among university students: An empirical test of Gottfredson and Hirchi's general theory. *Justice Quarterly, 12*, 231-255.

Gilvarry, E. (2000). Substance abuse in young people. *Journal of Child Psychology and Psychiatry, 41*, 55-80.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime* (1st ed.). Stanford, CA: Stanford University Press.

Gottfredson, M. R., & Hirschi, T. (2003). A general theory of crime. In F. T. Cullen R. Agnew (Ed.), *Criminological theory: Past to present* (2nd ed., pp. 240-251). Los Angeles, CA: Roxbury Publishing.

Greenberg, D. F. (1999). The weak strength of social control theory. *Crime and Delinquency, 45*, 68-81.

Grunbaum, J. A., Kann, L., Kinchen, S. A., Williams, B., Ross, J. G., Lowry, R., & Kolbe, L. (2002). Youth risk behavior surveillance--United States, 2001. *Journal of School Health, 72*, 313-328.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (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

.
Hirschi, T. (1969). *Causes of Delinquency* (1st ed.). Berkeley, CA: University of California Press.

Hirschi, T. (1996). Theory without ideas: Reply to Akers. *Criminology, 34*, 249-256.

Hirschi, T. (2003). Social bond theory. In F. T. Cullen R. Agnew (Ed.), *Criminological theory: Past to present* (2nd ed., pp. 231-239). Los Angeles, CA: Roxbury Publishing Company.

Hirschi, T., & Gottfredson, M. R. (2001). Self-control theory. In R. Paternoster R. Bachman (Ed.), *Explaining criminals and crime* (1st ed., pp. 81-96). Los Angeles, CA: Roxbury Publishing Company.

Hoffman, B. R., Monge, P. R., & Chou, C. (2007). Perceived peer influence and peer selection on adolescent smoking. *Addictive Behaviors, 32*, 1546-1554.

Jacobson, M. (2004). Booms and drug busts: Trends in youth drug use in the United States 1975-2000. *The Quarterly Journal of Economics, 119*, 1481-1512.

Johnson, R. E., & Marcos, A. C. (1988). Correlates of adolescent drug use by gender and geographic location. *American Journal of Drug and Alcohol Abuse, 14*, 51-63.

Johnston, L. D., O'Malley, P. M., & Bachman, G. J. (1998). National survey results on drug use from Monitoring the Future Study 1975-1997. *National Institute of Health,* , .

Kandel, D. (1975). Stages in adolescent involvement in drug use. *Science 190 (4217),* , 912-914.

Keyes, S., & Block, J. (1984). Prevalence and patterns of substance use among early adolescents. *Journal of Youth and Adolescence, 13*, 1-14.

Kornhauser, R. R. (1978). *Social sources and delinquency: An appraisal of analytic models.* Chicago, Illinois: Chicago: University of Chicago Press.

Krohn, M. D., & Massey, J. L. (1980). Social control and delinquent behavior: An examination of the elements of the social bonds. *The Sociological Quarterly, 4*, 529-544.

Krohn, M. D., Skinner, W. F., Massey, J. L., & Akers, R. L. (1985). Social learning theory and adolescent cigarette smoking: a longitudinal study. *Social Problems, 32*, 455-473.

Lagrange, R. L., & White, H. R. (1985). Age differences in delinquency: A test fo theory. *Criminology, 23*, 19-45.

LaGrange, T. C., & Silverman, R. A. (1999). Low self-control and opportunity: Testing the general theory of crime as an explanation for gender differences in delinquency. *Criminology, 37*, 41-72.

Lilly, J. R., Cullen, F. T., & Ball, R. A. (2007). *Criminological theory: Context and Consequences* (4th ed.). Thousand Oaks, CA: Sage Publications.

Lo, C. C., Kim, Y. S., & Church, W. T. (2008). The effects of victimization on drug use: A multilevel analysis. *Substance Use and Misuse, 43*, 1340-1361.

Matsueda, R. L. (1998). The current state of differential association theory. *Crime and Delinquency, 35*, 277-306.

Maume, M. O., Ousey, G. C., & Beaver, K. (2005). Cutting the grass: A reexamination of the link between marital attachment, delinquent peers and desistance from marijuana use. *Journal of Quantitative Criminology, 21*, 27-53.

Mazerolle, P., Burton, V. S., Cullen, F. T., Evans, T. D., & Payne, G. L. (2000). Stain, anger, and delinquent adaptations: Specifying general strain theory. *Journal of Criminal Justice, 28*, 89-101.

Merton, R. K. (1938). Social structure and anomie. *American Sociological Review, 3*, 672-682.

Monroe, J. (2004). Getting a puff: A social learning test of adolescent smoking. *Journal of Child & Adolescent Substance Abuse, 13*, 71-83.

Moffitt, T. E., Lynam, D. R., Silva, P. A. (1994). Neuropsychological tests predicting persistent male delinquency. Criminology, 32, 277-300.

Neff, J. L., & Waite, D. E. (2007). Male versus female substance abuse patterns among incarcerated juvenile offenders: Comparing strain and social learning variables. *Justice Quarterly, 24*, 106-132.

Nelson, D. E., Mowery, P., Asman, K., Pederson, L. L., O'Malley, P. M., & Malarcher, O'Malley, P. M., & Johnston, L. D. (1999). Drinking and driving among U.S. high school seniors 1984-1997. *American Journal of Public Health, 89*, 678-684.

O'Malley, P. M., & Johnston, L. D. (2003). Unsafe driving by high school seniors: National trends from 1976 to 2001 in tickets and accidents after use of alcohol, marijuana, and other illegal drugs. *Journal of Studies on Alcohol, 64*, 305-312.

O'Malley, P. M., & Johnston, L. D. (2007). Drugs and driving by American high school seniors, 2001-2006. *Journal of Alcohol and Drugs, 68*, .

O'Malley, P. M., Johnston, L. D., & Bachman, G. J. (1998). Alcohol use among adolescence. *Alcohol Health & Research World, 22*, 85-93.

Perrone, D., Sullivan, C. J., Pratt, T. C., & Margaryan, S. (2004). Parental efficacy, self-control, and delinquency: A test of a general theory of crime on a nationally representative sample of youth. *International Journal of Offender Therapy and Comparative Criminology, 48*, 298-312.

Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirchi's general theory of crime: A meta-analysis. *Criminology, 38*, 931-964.

Rankin, J. H., & Wells, L. E. (1990). The effect of parental attachments and direct controls on delinquency. *Journal of Research in Crime and Delinquency, 27*, 140-165.

Rebellon C J 2006 Do adolescents engage in delinquency to attract the social attention of peers? An extension and longitudinal test of the social reinforcement hypothesis. *Journal of Research in Crime and Delinquency, 43*, 387-411.

Robbers, M. L. (2004). Revisiting the moderating effect of social support on strain: a gendered test. *Sociological Inquiry, 74*, 546-569.

Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago, Illinois: Chicago: University of Chicago Press.

Sutherland, E. H. (1947). *Principles in Criminology* (4th ed.). Philadelphia, PA: J. B. Lippincott.

Sutherland, E. H., & Cressey, D. R. (2003). A theory of differential association. In F. T. Cullen R. Agnew (Ed.), *Criminological theory: Past and present* (2nd ed., pp. 131-133). Los Angeles, CA: Roxbury Publishing Company.

Swadi, H. (1999). Individual risk factors for adolescent substance abuse. *Drug and Alcohol Dependence, 55*, 209-224.

Sykes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review, 22*, 664-670.

Thompson, E. A., Smith-DiJulio, K., & Matthews, T. (1982). Social control theory: Evaluating a model of the study of adolescent alcohol and drug use. *Youth and Society, 13*, 303-326.

Tittle, C. R., Burke, M. J., & Jackson, E. F. (1986). Modeling Sutherland's theory of differential association: Toward an empirical clarification. *Social Forces, 65*, 405-432.

Tittle, C. R., Ward, D. A., & Grasmick, H. G. (2003). Gender, age, and crime/deviance: A challenge to self-control theory. *Journal of Research in Crime and Delinquency, 40*, 426-453.

United States: Mettapatterns and implications. *American Journal of Public Health, 98*, 908-915.

Warr, M. (2001). The social origins of crime: Edwin Sutherland and the theory of differential association. In R. Paternoster R. Bachman (Ed.), *Explaining criminals and crime (*pp. 182-191). Los Angeles, CA: Roxbury Publishing Company.

Warr, M., & Stafford, M. (1991). The influence of delinquent peers: What they think or what they do? *Criminology, 29*, 851-866.

Wiatrowski, M. D., Griswold, D. B., & Roberts, M. K. (1981). Social control and delinquency. *American Sociological Review, 46*, 525-541.

Wilcox, P., Tillyer, M. S., & Fisher, B. S. (2009). Gendered opportunity? School-based adolescent victimization. *Journal of Research in Crime and Delinquency, 46*, 245-269.

Winfree, T. L., & Bernat, F. P. (1998). Social learning, self-control, and substance abuse by eighth grade students: a tale of two cities. *Journal of Drug Issues, 28*, 539-558.

Appendix A. Survey Items Used to Construct the Social Learning Variables

Delinquent Peers

Thinking about your <u>closest</u> friends – How many of them have done any of the following things in the present school year?

1. Smoked cigarettes daily for one week or more
2. Used smokeless tobacco daily for one week or more
3. Gotten drunk
4. Smoked marijuana
5. Used inhalants (huffing)
6. Used cocaine/crack
7. Used speed
8. Used crystal meth
9. Taken ecstasy
10. Taken OxyContin
11. Taken other pills
12. Driven after drinking
    Responses coded as: 1 = no, 2 = yes
    Cronbach's alpha: .836

Family Use of Tobacco (Dichotomous Variable)

The following questions relate to tobacco products and use.

1. My father smokes or uses spit tobacco OR
2. My mother smokes or uses spit tobacco.
    Responses coded as: 0 = no 1 = yes

 Use of Tobacco at School (Dichotomous Variable)

The following questions relate to tobacco products and use.

1. The students in my school are allowed to smoke or dip in certain areas. OR
2. The teachers in my school are allowed to smoke or dip in certain areas.
    Responses coded as: 0 = no, 1 = yes

Pro-social beliefs

How wrong is it for someone your age to …

1.   Use alcohol
2. Use hard drugs such as heroin, cocaine, LSD
3. Use marijuana
    Responses codes as: 1 = not wrong at all, 2 = not very wrong, 3 = somewhat wrong, 4 = very wrong
    Cronbach's alpha: .852

Anti-Social Beliefs

How much do you agree with the following statements?

1. It's okay to break the law if you can get away with it
2. To get ahead, sometimes you have to do things that seem wrong

3. Most things that adults call "crime" don't really hurt anyone
4. It's okay to break the law if nobody is hurt by it
5. In order to gain respect from your friends, it is sometimes necessary to beat up on other kids
6. It's alright to beat up another person if he/she called you a dirty name
7. It's alright to beat up another person if he/she started the fight
8. Hitting another person is an acceptable way to get him/her to do what you want
   Responses codes as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree
   Cronbach's alpha: .868

Appendix B. Survey Items Used to Construct the Social Bond Variables

Attachment to Parents
How often do the following things happen with your mother? How often do the following things happen with your father?
1. My mother/father seems to understand me.
2. My mother/father makes rules that seem fair to me.
3. My mother/father is concerned with how I am doing in school.
4. My mother/father helps me with my homework.
5. My mother/father talks to me about my report card.
6. My mother/father makes me feel wanted.
7. I share my thoughts and feelings with my mother/father.
8. I talk to my mother/father.
9. I do things with my mother/father.
   Responses coded as: 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always
   Cronbach's alpha: .913

Direct Supervision
How often do the following things happen with your mother? How often do the following things happen with your father?
1. My mother/father knows where I am when I am away from home.
2. My mother/father knows who I am with when I am away from home.
3. My mother/father sets a time for me to be home at night.
   Responses coded as: 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always
   Cronbach's alpha: .813

Attachment to peers
Think of the people you consider your closest friend(s). How strongly do you agree or disagree with the following statements?
1. I respect the opinions of my closest friend(s).
2. My best friend(s) would stick by me if I got in trouble.
3. The people I think of as my best friend(s) also think of me as a best friend.
4. I fit in well with my best friend(s).
5. My best friend(s) take an interest in my problems.
6. I take an interest in the problems of my closest friend(s).
   Responses codes as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree
   Cronbach's alpha: .913

Attachment to School
How strongly do you agree or disagree with the following statements about your school?
1. I care a lot what my teachers think of me.
2. Most of my teachers are not interested in anything I say or do. (reverse coded)
3. Getting an education is important to me.

4. I would quit school now if I could. (reverse coded)
5. Most of my classes are a waste of time. (reverse coded)
6. I look forward to coming to school most mornings.
   Responses codes as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree
   Cronbach's alpha: .698

Student GPA
Which of the following best describes your overall grade average?
Responses coded as: 1 = F, 2 = D, 3 = C, 4 = B, 5 = A

Commitment to School
How much schooling do you think you will complete?
Responses codes as: 1 = some high school, 2 = high school/GED, 3 = vocational/trade school, 4 = some college, 5 = college degree, 6 = graduate or professional school after college, 7 = don't know

Involvement in School Activities (Dichotomous Variable)
1. During the school year, about how often do you take part in school sports? OR
2. During the school year, about how often do you take part in other school activities?
   Responses coded as: 0 = no, 1 = yes

Involvement in Community Activities (Dichotomous Variable)
1. During the school year how often do you take part in community activities? OR
2. During the school year, how many hours <u>PER WEEK </u>do you work at a part-time job (including babysitting, family farm labor, etc)?
   Responses codes as: 0 = no, 1 = yes

Appendix C. Survey Items Used to Construct the Self-Control Variables

Impulsivity
Please mark how often the following statements are true.
1. I have trouble controlling my temper.
2. I have difficulty remaining seated at school.
3. I get very restless after a few minutes if I am supposed to sit still.
4. When I am angry, I lose control over my actions.
5. I have difficulty keeping attention on tasks.
6. I get so frustrated that I feel like a bomb ready to explode.
7. Little things or distractions/interruptions throw me off.
8. I'm nervous or on edge.
9. I can't seem to stop moving.
10. I don't pay attention to what I'm doing.
11. I am afraid I will lose control of my feelings.
    Responses codes as: 1 = never true, 2 = sometimes true, 3 = mostly true, 4 = always true
    Cronbach's alpha: .909

Appendix D. Survey Items Used to Construct the General Strain Variables

Perceived Injustice
How strongly do you agree or disagree with the following statements about your school
1. All students are treated fairly.
2. The school rules are fair.
3. The punishment for breaking school rules is the same for all students no matter who you are.
4. If a school rule is broken, students know what kind of punishment will follow.
5. The teachers are fair
6. The principal is fair
   Responses coded as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree
   Cronbach's alpha: .724

Perceived Risk of Victimization
How often are you afraid/worried that you will…
1. Be physically attacked (example: punched, slapped, kicked)
2. Be forced to give up your money or property
3. Have money or property stolen when you are not around
4. Receive unwelcome sexual remarks from someone
5. Be touched by someone in a sexual manner without your consent or against your will
6. Have a gun pulled on you
7. Have a weapon pulled on you (knife, brass knuckles, and so on, other than gun)
   Responses coded as: 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always
   Cronbach's alpha: .828

Actual Victimization
In the current school year, how many times have the following things actually happened to you on school grounds or during school-related activities?
1. Been physically attacked (example: punched, slapped, kicked)
2. Been forced to give up your money or property
3. Had money or property stolen when you were not around
4. Received unwelcome sexual remarks from someone
5. Been touched by someone in a sexual manner without your consent or against your will
6. Had a gun pulled on you
7. Had a weapon pulled on you (knife, brass knuckles, and so on, other than gun)
   Responses ranged from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10+
   Cronbach's alpha: .653

Teacher Hostilities
When acts of violence happen at your school, how often do teachers nearby do the following?

1. Cheer it on
2. Watch without doing anything
   Responses coded as: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always
   Cronbach's alpha: .766

Peer Hostilities

Do you feel that you have been teased/picked on in a mean way because you are a member of a certain group?
Responses codes as 0 = no, 1 = yes

Appendix E. Survey Items Used to Construct the Dependent Variables of Alcohol Use

Binge Drinking
Which of the following best describes how much alcohol you usually drink at one time?
Responses coded as: 1 = don't drink, 2 = small amount (1 beer, 1 drink or less), 3 = medium amount (2 to 3 beers or drinks), 4 = large amount (4 to 8 beers or drinks), 5 = very large amount (9 or more beers or drinks)

Frequency of Alcohol Use over Time
In the present school year, how often have you done any of the following…
1. Drunk alcohol?
   Responses coded as: 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily

Problem Drinking
Because of alcohol, how often have you…
1. Had a hangover?
2. Gotten sick to your stomach/vomited?
3. Been unable to remember what you did?
   Responses coded as: 1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always
   Cronbach's Alpha: .736

Problem Drinking over Time
In the present school year, how often have you done any of the following…
1. Gotten drunk?
   Responses coded as: 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily

Appendix F. Survey Items Used to Construct the Dependent Variables of Drug Use

Frequency of Marijuana Use
In the present school year, how often have you done any of the following…
1. Smoked marijuana?
   Responses coded as: 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily

Frequency of Drug Use
In the present school year, how often have you done any of the following…
1. Used inhalants (huffing)?
2. Used cocaine/crack?
3. Used speed?
4. Used crystal meth?
   Responses coded as: 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily
   Cronbach's Alpha: .911

Appendix G. Survey Items Used to Construct the Dependent Variables of Tobacco Use

Frequency of Smoking
On average, about how many cigarettes do you smoke per day?
Response Codes as: _____ cigarettes/day

Smoking Dependency
How soon after you wake in the morning do you smoke your first cigarette?
Responses coded as: 1 = within five minutes, 2 = within 6 to 15 minutes, 3 = within 16 to 30 minutes, 4 = within 31 minutes to an hour, 5 = over an hour

Tobacco Use over Time
  1. In the present school year, how often have you smoked Cigarettes?
     Responses coded as: 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about 1-2 times per week, 5 = daily or almost daily

Appendix H. Survey Items Used to Construct the Control Variables --- Demographics

Gender
What is your sex?
Responses coded as: 1 = male, 2 = female

Age
Coded as mm/dd/year

Race
How do you describe yourself?
1. African-American
2. White
3. Asian-American
4. White and Black
5. Hispanic American
6. Other
7. Native-American
    Responses coded as: 0=Non-white, 1=White

Appendix I. Survey Items Used to Construct the Control Variables --- Family Instability

Number of Times Moved
How many times have you moved in the past year?
Responses coded as: 1 = 0 times, 2 = 1 time, 3 = 2 times, 4 = 3 times, 5 = 4 times, 6 = 5 times, 7 = more than 5 times

Appendix J. Survey Items Used to Construct the Control Variables --- Opportunity

Opportunity to Obtain Alcohol
During a typical school day, it is easy for someone my age to get alcohol…
Responses coded as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree

Opportunity to Obtain Tobacco
During a typical school day, it is easy for someone my age to get tobacco…
Responses coded as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree

Opportunity to Obtain Marijuana
During a typical school day, it is easy for someone my age to get marijuana
Responses coded as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree.

Opportunity to Obtain Drugs
During a typical school day, it is easy for someone my age to get the following…
   1. Inhalants (for "huffing")
   2. Cocaine/Crack
   3. Ecstasy
   4. OxyContin
   5. Other pills
        Responses coded as: 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat disagree, 4 = strongly agree
        Cronbach's alpha: .831

Appendix K. Bivariate Relationships between Independent Variables

Variables	Delinquent Peers	Family Use of Tobacco	Use of Tobacco at School	Pro-Social Beliefs	Anti-Social Beliefs	Attachment to Parents
Delinquent Peers	1.00					
Family Use of Tobacco	.012	1.00				
Use of Tobacco at School	.006	.059**	1.00			
Pro-Social Beliefs	-.004	-.085**	-.097**	1.00		
Anti-Social Beliefs	-.002	.113**	.122**	-.269**	1.00	
Attachment to Parents	-.240**	.000	.007	.008	.005	1.00
Direct Supervision	-.237**	.008	.005	.002	.010	.708**
Attachment to Peers	-.073**	.016	-.013	-.001	.009	.182**
Attachment to School	-.255**	-.013	-.010	.000	.014	.371**
Student GPA	-.183**	-.002	.001	.000	-.006	.208**
Commitment to School	-.096	.003	.002	-.013	.001	.060**
Involvement in School Activities	.019	-.075	-.007	.102	-.106	.002
Involvement in Community Activities	.033	-.071	-.013	.110**	-.101**	-.003
Impulsivity	.244**	.022*	.004	.004	.004	-.275**
Perceived Injustice	.252**	.013	.025**	-.046**	.050**	-.336**
Perceived Risk of Victimization	-.009	.054*	.129	-.089**	.160**	.013
Actual Victimization	.194**	.031**	.015	-.018	.032**	-.170**
Teacher Hostilities	-.011	-.034**	-.151**	.242**	-.149**	-.006
Peer Hostilities	.004	.028**	.053**	-.004	.112**	.011
Gender	.009	.013	-.001	-.001	.005	-.049**
Age	.311**	-.024**	-.003	-.001	-.007	-.123**
Race	.018*	-.011	.000	.005	.002	.103**
Number of Times Moved	.034**	.006	.003	-.009	.001	-.104**
Opportunity to Obtain Alcohol	.272	.009	-.003	.014	-.002	-.138
Opportunity to Obtain Tobacco	.391	.015	.010	.000	.002	-.184**
Opportunity to Obtain Marijuana	.395	.007	-.003	-.013	.011	-.206**
Opportunity to Obtain Drugs	.252**	.008	-.009	-.006	.012	-.138**

156

Bivariate Relationships between Independent Variables Cont…

Variables	Direct Supervision	Attachment to Peers	Attachment to School	Student GPA	Commitment to School	Involvement in School
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision	1.00					
Attachment to Peers	.172**	1.00				
Attachment to School	.352**	.260**	1.00			
Student GPA	.200**	.146**	.317**	1.00		
Commitment to School	.062**	.101**	.183**	.301**	1.00	
Involvement in School Activities	-.001	-.005	-.014	.001	.007	1.00
Involvement in Community Activities	-.010	-.012	-.018	.017	.008	.177
Impulsivity	-.250**	-.059**	-.340**	-.277**	-.079**	.004
Perceived Injustice	-.320**	-.171**	-.526**	-.168**	-.059**	.003
Perceived Risk of Victimization	.019*	.011	-.004	.005	-.006	.014
Actual Victimization	-.165**	-.084**	-.197**	-.173**	.018*	.002
Teacher Hostilities	-.008	.002	-.005	-.003	.005	.061**
Peer Hostilities	.019*	.002	-.002	.017	.349**	.029**
Gender	.048**	.269**	.200**	.157**	.134**	.009
Age	-.101**	-.055**	-.119**	-.074**	.000	.011
Race	.125**	.053**	.046**	.106**	-.004	.013
Number of Times Moved	-.100**	-.034**	-.006**	-.117**	-.027**	.005
Opportunity to Obtain Alcohol	-.148**	.013	-.197**	-.021*	.021*	.004
Opportunity to Obtain Tobacco	-.177**	.037**	-.191**	-.064**	-.033**	.016
Opportunity to Obtain Marijuana	-.218**	-.010	-.252**	-.123**	-.032**	.002
Opportunity to Obtain Drugs	-.136**	-.005	-.187**	-.022*	.026**	.009

Bivariate Relationships between Independent Variables Cont…

Variables	Involvement in Comm.	Impulsivity	Perceived Injustice	Perceived Risk of Vic	Actual Vic	Teacher Hostilities
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision						
Attachment to Peers						
Attachment to School						
Student GPA						
Commitment to School						
Involvement in School Activities						
Involvement in Community Activities	1.00					
Impulsivity	.004	1.00				
Perceived Injustice	.003	.275**	1.00			
Perceived Risk of Victimization	.017	-.004	.043	1.00		
Actual Victimization	.035**	.289**	.226**	.113**	1.00	
Teacher Hostilities	.061**	-.012	.047**	-.149**	-.027	1.00
Peer Hostilities	.010	-.003	.030**	.243	.063**	-.027**
Gender	-.015	-.051**	-.072**	.021*	.021*	.002
Age	.023*	-.062**	.106**	-.005	-.040**	-.002
Race	.026**	-.049**	-.064**	.007	-.048**	-.008
Number of Times Moved	-.001	.097**	.043**	.007	.078	.004
Opportunity to Obtain Alcohol	.028**	.120**	.248**	.005	.159**	.002
Opportunity to Obtain Tobacco	.029**	.133**	.247**	.004	.149**	-.002
Opportunity to Obtain Marijuana	.021*	.166**	.292**	.007	.175**	-.003
Opportunity to Obtain Drugs	.018*	.154**	.241**	.012	.228	-.077

Bivariate Relationships between Independent Variables Cont...

Variables	Peer Hostilities	Gender	Age	Race	Number of Times Moved	Opp Alc	Opp Tob	Opp Marj	Opp Drugs
Delinquent Peers									
Family Use of Tobacco									
Use of Tobacco at School									
Pro-Social Beliefs									
Anti-Social Beliefs									
Attachment to Parents									
Direct Supervision									
Attachment to Peers									
Attachment to School									
Student GPA									
Commitment to School									
Involvement in School Activities									
Involvement in Community Activities									
Impulsivity									
Perceived Injustice									
Perceived Risk of Victimization									
Actual Victimization									
Teacher Hostilities									
Peer Hostilities	1.00								
Gender	.003	1.00							
Age	.008	-.045**	1.00						
Race	.012	.011	.008	1.00					
Number of Times Moved	-.003	.008	-.037**	-.062	1.00				
Opportunity to Obtain Alcohol	-.005	-.006	.234	-.014	-.002	1.00			
Opportunity to Obtain Tobacco	-.004	.033**	.347**	.031**	.003	.614**	1.00		
Opportunity to Obtain Marijuana	.001	-.006	.326**	-.043**	.018	.653**	.656**	1.00	
Opportunity to Obtain Drugs	-.005	.048**	.133**	-.028**	-.001	.644	.515**	.681**	1.00

159

Appendix L. Bivariate Relationships between Dependent and Independent Variables

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Binge Drinking	1.00				
Frequency of Alcohol Use	.012	1.00			
Problem Drinking	.538**	.017	1.00		
Problem Drinking Over time	.013	.779**	.012	1.00	
Frequency of Marijuana Use	.015	.521**	.021	.589**	1.00
Frequency of Drug Use	.735	.318**	.009	.352**	.457**
Frequency of Smoking	.036	.015	.064	-.002	-.015
Smoking Dependency	-.005	-.022	-.055	-.011	.020
Tobacco Use over Time	.007	.520**	.012	.518**	.549**
Delinquent Peers	-.003	.443**	-.007	.423**	.369**
Family Use of Tobacco	.134**	.008	.094**	.010	.005
Use of Tobacco at School	.116	-.008	.109**	-.012	.009
Pro-Social Beliefs	-.501**	-.002	.258**	-.009	.028
Anti-Social Beliefs	.338**	.002	.241	.011	.000
Attachment to Parents	.007	-.249**	-.021	-.225**	-.221**
Direct Supervision	-.001	-.296**	-.002	-.226	-.257**
Attachment to Peers	.000	-.021*	-.022	-.016	-.060**
Attachment to School	.017	-.278**	.004	-.269**	-.274**
Student GPA	.000	-.167**	-.006	-.199**	-.238**
Commitment to School	.062	-.063	.020	-.098**	-.110**
Involvement in School Activities	-.064**	.009	-.062**	.011	.009
Involvement in Community Activities	-.060	.042**	-.054**	.036**	.021*
Impulsivity	-.004	.227**	-.011	.213**	.232
Perceived Injustice	.036**	.288**	.027	.261**	.242**
Perceived Risk of Victimization	.135**	.010	.169**	.007	.003
Actual Victimization	.038**	.193	.039	.159**	.142**
Teacher Hostilities	-.111	.005	-.104**	.006	.004
Peer Hostilities	.020*	.014	.019	.015	.008

160

Bivariate Relationships between Dependent and Independent Variables Cont...

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Gender	-.018*	-.028**	-.027	-.046**	-.076**
Age	-.014	.236**	-.007	.244**	.170**
Race	-.021*	.005	-.014	.005	-.025**
Number of Times Moved	.015	.045**	.008	.057**	.058**
Opportunity to Obtain Alcohol	-.005	.258**	-.012	.226**	.167**
Opportunity to Obtain Tobacco	-.004	.305**	-.009	.279**	.234**
Opportunity to Obtain Marijuana	.004	.341**	.010	.323**	.328**
Opportunity to Obtain Drugs	-.011	.188**	-.011	.164**	.142**

161

Bivariate Relationships between Dependent and Independent Variables Cont….

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Binge Drinking				
Frequency of Alcohol Use				
Problem Drinking				
Problem Drinking Over time				
Frequency of Marijuana Use				
Frequency of Drug Use	1.00			
Frequency of Smoking	-.014	1.00		
Smoking Dependency	.022	-.626**	1.00	
Tobacco Use over Time	.351**	-.003	-.013	1.00
Delinquent Peers	.206**	.009	.022	.402**
Family Use of Tobacco	.002	.013	-.015	.012
Use of Tobacco at School	.000(dc)	.002	-.035	.008
Pro-Social Beliefs	.010	.023	.028	-.010
Anti-Social Beliefs	-.005	-.028	.000	.007
Attachment to Parents	-.121	-.041	.034	-.248**
Direct Supervision	-.153	-.019	.028	-.251**
Attachment to Peers	-1.00	-.003	.011	-.039**
Attachment to School	-.195**	-.016	.012	-.285**
Student GPA	-.139	-.036	.016	-.268**
Commitment to School	-.060	-.012	-.007	-.129**
Involvement in School Activities	.012	-.030	.021	.018*
Involvement in Community Activities	.018*	.002	.016	.026**
Impulsivity	.217**	.011	-.019	.273**
Perceived Injustice	.153**	.010	-.019	.237**
Perceived Risk of Victimization	-.002**	-.043	.039	-.008
Actual Victimization	.278**	-.007	.014	.171**
Teacher Hostilities	.016	-.017	.016	.002
Peer Hostilities	.005	-.014	.031	.000

162

Bivariate Relationships between Dependent and Independent Variables Cont….

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Gender	-.076**	-.026	.012	.008
Age	.022**	-.004	.170**	.120**
Race	-.033**	.010	-.003	.043**
Number of Times Moved	.048**	.000(dc)	.058**	.084**
Opportunity to Obtain Alcohol	.133**	-.027	.047	.137
Opportunity to Obtain Tobacco	.124**	-.022	.033	.261
Opportunity to Obtain Marijuana	.176**	-.016	.031	.257
Opportunity to Obtain Drugs	.180**	-.006	.142**	.115**

163

Appendix M Bivariate Relationships between Independent Variables --Males

Variables	Delinquent Peers	Family Use of Tobacco	Use of Tobacco at School	Pro-Social Beliefs	Anti-Social Beliefs	Attachment to Parents
Delinquent Peers	1.00					
Family Use of Tobacco	.003	1.00				
Use of Tobacco at School	.022	.032	1.00			
Pro-Social Beliefs	.011	-.088	-.083**	1.00		
Anti-Social Beliefs	-.008	.104**	.108	-.276**	1.00	
Attachment to Parents	-.218**	-.004	-.012	.002	.026	1.00
Direct Supervision	-.224**	.011	-.003	-.008	.021	.694**
Attachment to Peers	-.084**	.013	-.017	-.004	.012	.240**
Attachment to School	-.260**	-.025	-.018	-.005	.000	.398**
Student GPA	-.160**	-.002	.001	-.010	.010	.176**
Commitment to School	-.101**	-.010	-.001	-.021	.007	.056**
Involvement in School Activities	.032*	-.097	-.010	.098**	-.121**	.002
Involvement in Community Activities	.039**	-.064	.000	.115**	-.113**	-.005
Impulsivity	.232**	.018	.014	.016	-.002	-.224**
Perceived Injustice	.227**	.012	.030*	-.037**	.044**	-.349**
Perceived Risk of Victimization	-.015	.055**	.115**	-.093**	.145**	.009
Actual Victimization	.153**	.035**	.010	-.016	.029	-.131**
Teacher Hostilities	-.006	-.037	-.114**	.245**	-.146**	-.004
Peer Hostilities	.003	.026	.056**	.009	.094**	.005
Age	.288	-.031*	-.009	.009	-.024	-.101**
Race	.026	.002	.005	.006	-.002	.083**
Number of Times Moved	.027	-.008	.009	-.009	-.016	-.092**
Opportunity to Obtain Alcohol	.270**	.005	-.020	.021	.003	-.128**
Opportunity to Obtain Tobacco	.369**	.017	.001	.007	.004	-.156**
Opportunity to Obtain Marijuana	.389**	-.002	.000	-.028*	.013	-.185**
Opportunity to Obtain Drugs	.252**	-.001	-.018	-.001	.004	-.127**

164

Bivariate Relationships between Independent Variables -- Males Cont...

Variables	Direct Supervision	Attachment to Peers	Attachment to School	Student GPA	Commitment to School	Involvement in School
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision	1.00					
Attachment to Peers	.201**	1.00				
Attachment to School	.362**	.252**	1.00			
Student GPA	.190**	.103**	.297**	1.00		
Commitment to School	.062**	.072**	.176**	.325	1.00	
Involvement in School Activities	.007	-.010	-.007	.001	.009	1.00
Involvement in Community Activities	-055	-.018	-.032*	.017	-.011	.175**
Impulsivity	-.218**	-.036**	-.315**	-.231**	-.056*	-.006
Perceived Injustice	-.315	-.184**	-.531**	-.172**	-.069**	-.004
Perceived Risk of Victimization	.026	.007	-.018	-.003	.008	.019
Actual Victimization	-.121**	-.128**	-.225**	-.074**	.025	.003
Teacher Hostilities	-.018	.001	-.006	-.004	.009	.053**
Peer Hostilities	.018	.005	-.018	.017	.012	.029
Age	-.081	-.053**	-.081**	-.080**	-.105**	.008
Race	.115**	.041	.034**	.106**	-.014	.008
Number of Times Moved	-.080	-.045**	-.078**	-.122**	-.043**	-.008
Opportunity to Obtain Alcohol	-.128**	-.001	-.211**	-.028*	.013	.004
Opportunity to Obtain Tobacco	-.151**	.023	-.216**	-.084**	-.052**	.021
Opportunity to Obtain Marijuana	-.194**	-.029*	-.277**	-.138**	-.043**	.003
Opportunity to Obtain Drugs	-.133**	-.024	-.221**	-.050**	.015	.020

Bivariate Relationships between Independent Variables -- Males Cont…

Variables	Involvement in Comm.	Impulsivity	Perceived Injustice	Perceived Risk of Vic	Actual Vic	Teacher Hostilities
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision						
Attachment to Peers						
Attachment to School						
Student GPA						
Commitment to School						
Involvement in School Activities						
Involvement in Community Activities	1.00					
Impulsivity	.030*	1.00				
Perceived Injustice	.019	.271**	1.00			
Perceived Risk of Victimization	.004	-.009	.041	1.00		
Actual Victimization	.037**	.275**	.216**	.101	1.00	
Teacher Hostilities	.053**	-.017	-.017	-.153	-.039**	1.00
Peer Hostilities	.032	.009	.030	.250**	.058**	-.015
Age	.006	-.090**	.068**	.006	-.064	.006
Race	.037*	-.033*	-.039**	.004	-.048**	-.013
Number of Times Moved	-.003	.103	.046**	.007	.087**	.007
Opportunity to Obtain Alcohol	.013	.122**	.244**	.003	.132	-.004
Opportunity to Obtain Tobacco	.034**	.124***	.247***	.012	.089**	.002
Opportunity to Obtain Marijuana	.014	.161**	.298***	.011	.124***	-.010
Opportunity to Obtain Drugs	.015	.165**	.251**	.012	.246**	-.012

166

Bivariate Relationships between Independent Variables-- Males Cont…

Variables	Peer Hostilities	Age	Race	Number of Times Moved	Opp Alc	Opp Tob	Opp Marj	Opp Drugs
Delinquent Peers								
Family Use of Tobacco								
Use of Tobacco at School								
Pro-Social Beliefs								
Anti-Social Beliefs								
Attachment to Parents								
Direct Supervision								
Attachment to Peers								
Attachment to School								
Student GPA								
Commitment to School								
Involvement in School Activities								
Involvement in Community Activities								
Impulsivity								
Perceived Injustice								
Perceived Risk of Victimization								
Actual Victimization								
Teacher Hostilities								
Peer Hostilities	1.00							
Age	.002	1.00						
Race	.008	.001	1.00					
Number of Times Moved	.011	-.028	-.051**	1.00				
Opportunity to Obtain Alcohol	.012	.220**	-.006	-.010	1.00			
Opportunity to Obtain Tobacco	.006	.324**	.034**	-.011	.631**	1.00		
Opportunity to Obtain Marijuana	.008	.293**	-.037*	.019	.665**	.664**	1.00	
Opportunity to Obtain Drugs	-.011	.107**	.038**	.008	.647**	.506**	.672**	1.00

167

Appendix N. Bivariate Relationships between Dependent and Independent Variables -- Males

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Binge Drinking	1.00				
Frequency of Alcohol Use	.002	1.00			
Problem Drinking	.537**	-.013	1.00		
Problem Drinking Over time	.003	.796**	-.024	1.00	
Frequency of Marijuana Use	.013	.551**	-.011	.611**	1.00
Frequency of Drug Use	.013	.347**	-.003	.385**	.498**
Frequency of Smoking	.044	.000	.137*	.011	-.027
Smoking Dependency	-.012	-.017	-.090	-.029	.021
Tobacco Use over Time	.003	.514**	-.012	.515**	.546**
Delinquent Peers	-.010	.442**	-.034	.424**	.387**
Family Use of Tobacco	.136**	.011	.101**	.012	.004
Use of Tobacco at School	.115**	-.010	.127**	-.014	.012
Pro-Social Beliefs	-.515**	.009	-.281**	.002	-.003
Anti-Social Beliefs	.342**	.001	.225**	-.001	.011
Attachment to Parents	.013	-.224**	-.022	-.207**	-.212
Direct Supervision	.017	-.264**	-.009	-.234**	-.047**
Attachment to Peers	.013	-.050**	-.016	-.036**	-.072**
Attachment to School	.035**	-.288	.030	-.281**	-.282**
Student GPA	.022	-.161**	-.022	-.185**	-.217**
Commitment to School	.025	-.079**	.037	-.100**	-.103**
Involvement in School Activities	-.072**	.004	-.074**	.016	.008
Involvement in Community Activities	-.076**	.044	-.080**	.039**	.018
Impulsivity	-.014	.220**	-.022	.201**	.218
Perceived Injustice	.023	.264**	.028	.249**	.247**
Perceived Risk of Victimization	.157**	-.003	.141**	-.005	.003
Actual Victimization	.045**	.133**	.020	.110	.122**
Teacher Hostilities	-.126**	.012	-.115	.017	.000
Peer Hostilities	.013	.026	.013	.022	.019

Bivariate Relationships between Dependent and Independent Variables -- Males Cont…

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Age	-.030*	.217**	-.016	.229**	.158**
Race	-.028*	.021	-.058*	.008	-.035**
Number of Times Moved	.006	.030*	-.010	.041**	.051**
Opportunity to Obtain Alcohol	-.018	.247**	-.027	.228**	.200**
Opportunity to Obtain Tobacco	-.016	.282**	-.024	.270**	.258**
Opportunity to Obtain Marijuana	.007	.327**	.002	.324**	.355**
Opportunity to Obtain Drugs	-.009	.185**	-.028	.181**	.183**

169

Bivariate Relationships between Dependent and Independent Variables Males Cont….

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Binge Drinking				
Frequency of Alcohol Use				
Problem Drinking				
Problem Drinking Over time				
Frequency of Marijuana Use				
Frequency of Drug Use	1.00			
Frequency of Smoking	-.010	1.00		
Smoking Dependency	.017	-.164**	1.00	
Tobacco Use over Time	.380**	-.034	.004	1.00
Delinquent Peers	.233**	.014	.008	.387
Family Use of Tobacco	.011	-.021	-.045	.013
Use of Tobacco at School	-.004	.006	-.068*	.029*
Pro-Social Beliefs	.005	.053	.015	-.009
Anti-Social Beliefs	-.011	-.022	.010	.004
Attachment to Parents	-.131**	-.043	.026	-.200**
Direct Supervision	-.141**	-.001	.017	-.214***
Attachment to Peers	-.100**	.019	-.014	-.080**
Attachment to School	-.195**	-.012	-.030	-.323**
Student GPA	-.121**	-.043	.011	-.255***
Commitment to School	-.057**	-.071*	.028	-.137**
Involvement in School Activities	.028*	-.039	.020	.013
Involvement in Community Activities	.023	.029	-.009	.038**
Impulsivity	.229**	-.004	-.009	.253**
Perceived Injustice	.154**	-.010	.039	.228**
Perceived Risk of Victimization	-.003	-.049	.059	-.006
Actual Victimization	.330**	.013	-.036	.128**
Teacher Hostilities	.020	-.040	.046	.014
Peer Hostilities	.014	-.037	.056	.012
	170			

Bivariate Relationships between Dependent and Independent Variables Males Cont….

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Age	.023	-.024	.020	.101**
Race	-.045**	.029	.011	.046**
Number of Times Moved	.073**	.002	.043	.066**
Opportunity to Obtain Alcohol	.161**	-.024	.022	.136**
Opportunity to Obtain Tobacco	.137**	-.041	.033	.258**
Opportunity to Obtain Marijuana	.201**	-.031	.027	.251**
Opportunity to Obtain Drugs	.233**	-.033	.066	.122**

171

Appendix O. Bivariate Relationships between Independent Variables ---Females

Variables	Delinquent Peers	Family Use of Tobacco	Use of Tobacco at School	Pro-Social Beliefs	Anti-Social Beliefs	Attachment to Parents
Delinquent Peers	1.00					
Family Use of Tobacco	.020	1.00				
Use of Tobacco at School	-.009	.084**	1.00			
Pro-Social Beliefs	-.018	-.081**	-.109**	1.00		
Anti-Social Beliefs	.004	.121**	.135**	-.264**	1.00	
Attachment to Parents	-.259**	.005	.023	.013	-.011	1.00
Direct Supervision	-.250**	.005	.011	.010	.001	.728**
Attachment to Peers	-.067**	.013	-.009	.002	.003	.168**
Attachment to School	-.266**	-.007	-.001	.006	.027	.382**
Student GPA	-.214**	-.013	.016	.009	-.021	.258**
Commitment to School	-.095**	.014	.006	-.007	-.003	.079**
Involvement in School Activities	.008	-.059**	-.005	.109**	-.097**	.002
Involvement in Community Activities	.028	-.075**	-.024	.106**	-.091**	-.003
Impulsivity	.257**	.027*	-.006	-.006	.009	-.327**
Perceived Injustice	.278**	.017	.021	-.055**	.055**	-.334**
Perceived Risk of Victimization	-.003	.054**	.041**	-.083**	.170**	.018
Actual Victimization	.240**	.062*	.020	-.020	.037**	-.207**
Teacher Hostilities	-.016	-.030*	-.182**	.241**	-.153**	-.006
Peer Hostilities	.004	.033	.049**	-.013	.124**	.017
Age	.334**	-.018	.003	-.010	.008	-.147**
Race	.011	-.023	-.005	.005	.006	.121**
Number of Times Moved	.041**	.019	-.002	-.010	.016	-.115**
Opportunity to Obtain Alcohol	.275**	.014	.012	.007	-.006	-.147**
Opportunity to Obtain Tobacco	.411**	.013	.018	-.006	.000	-.208**
Opportunity to Obtain Marijuana	.401**	.015	-.006	.001	.008	-.226**
Opportunity to Obtain Drugs	.252**	.015	-.001**	-.011	.018	-.144**

172

Bivariate Relationships between Independent Variables – Females Cont…

Variables	Direct Supervision	Attachment to Peers	Attachment to School	Student GPA	Commitment to School	Involvement in School
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision	1.00					
Attachment to Peers	.129**	1.00				
Attachment to School	.339**	.168**	1.00			
Student GPA	.202**	.125**	.297**	1.00		
Commitment to School	.053**	.057**	.153**	.309**	1.00	
Involvement in School Activities	-.008	-.004	-.026*	-.008	.003	1.00
Involvement in Community Activities	-.012	.002	.002	.026*	.032	.179**
Impulsivity	-.277**	-.064**	-.360**	.314**	-.094**	.015
Perceived Injustice	-.321**	-.126**	-.516**	-.150**	-.034**	.012
Perceived Risk of Victimization	.012	.004	.001	.006	-.025*	.009
Actual Victimization	-.214**	-.047**	-.183**	-.095**	-.009	.000
Teacher Hostilities	.001	.002	-.003	-.005	.000	.067**
Peer Hostilities	.018	-.005	.013	.024	.012	.025
Age	-.114**	-.034**	-.144**	-.058**	-.060**	.014
Race	.134**	.070**	.056**	.110**	.003	.018
Number of Times Moved	-.118**	-.031*	-.061**	-.123**	-.018	.017
Opportunity to Obtain Alcohol	-.167**	.024	-.193**	.008	.033**	.005
Opportunity to Obtain Tobacco	-.203**	.036**	-.189**	-.071**	-.034**	.011
Opportunity to Obtain Marijuana	-.240**	.006	-.238**	-.101**	-.004	.000
Opportunity to Obtain Drugs	-.144**	-.011	-.182**	-.015	.021	-.002

Bivariate Relationships between Independent Variables -- Females Cont...

Variables	Involvement in Comm.	Impulsivity	Perceived Injustice	Perceived Risk of Vic	Actual Vic	Teacher Hostilities
Delinquent Peers						
Family Use of Tobacco						
Use of Tobacco at School						
Pro-Social Beliefs						
Anti-Social Beliefs						
Attachment to Parents						
Direct Supervision						
Attachment to Peers						
Attachment to School						
Student GPA						
Commitment to School						
Involvement in School Activities						
Involvement in Community Activities	1.00					
Impulsivity	-.012	1.00				
Perceived Injustice	.003	.274**	1.00			
Perceived Risk of Victimization	.029*	.002	.048**	1.00		
Actual Victimization	.035**	.310**	.243**	.124**	1.00	
Teacher Hostilities	.067**	-.006	-.036**	-.159**	-.016	1.00
Peer Hostilities	-.009	-.015	.031*	.234**	.036**	-.036**
Age	.036**	-.040**	.138**	-.013	-.013	-.009
Race	.017	-.063**	-.087**	.009	-.050**	-.003
Number of Times Moved	.001	.092**	.041**	.007	.068**	.001
Opportunity to Obtain Alcohol	.040**	.118**	.253**	.008	.183**	.007
Opportunity to Obtain Tobacco	.025*	.145**	.253**	-.005	.201**	-.005
Opportunity to Obtain Marijuana	.027*	.172**	.287**	.004	.223**	.003
Opportunity to Obtain Drugs	.022	.150**	.241**	.010	.208**	-.003

174

Bivariate Relationships between Independent Variables-- Females Cont...

Variables	Peer Hostilities	Age	Race	Number of Times Moved	Opp Alc	Opp Tob	Opp Marj	Opp Drugs
Delinquent Peers								
Family Use of Tobacco								
Use of Tobacco at School								
Pro-Social Beliefs								
Anti-Social Beliefs								
Attachment to Parents								
Direct Supervision								
Attachment to Peers								
Attachment to School								
Student GPA								
Commitment to School								
Involvement in School Activities								
Involvement in Community Activities								
Impulsivity								
Perceived Injustice								
Perceived Risk of Victimization								
Actual Victimization								
Teacher Hostilities								
Peer Hostilities	1.00							
Age	.013	1.00						
Race	.016	.016	1.00					
Number of Times Moved	-.016	-.044**	-.073**	1.00				
Opportunity to Obtain Alcohol	-.021	.248**	-.021	.006	1.00			
Opportunity to Obtain Tobacco	-.013	.372**	.027*	.013	.612**	1.00		
Opportunity to Obtain Marijuana	-.005	.357**	-.049**	.018	.650**	.665**	1.00	
Opportunity to Obtain Drugs	.001	.162	-.021	-.011	.644**	.522**	.691**	1.00

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Binge Drinking	1.00				
Frequency of Alcohol Use	.021	1.00			
Problem Drinking	.538**	.047*	1.00		
Problem Drinking Over time	.023	.763**	.047*	1.00	
Frequency of Marijuana Use	.014	.493**	.053*	.567**	1.00
Frequency of Drug Use	-.010	.290**	.031	.317**	.406**
Frequency of Smoking	.021	.028	-.014	-.015	-.003
Smoking Dependency	-.002	-.027	-.016	.007	.021
Tobacco Use over Time	.011	.526**	.036	.524**	.561**
Delinquent Peers	.004	.444**	.020	.424**	.357**
Family Use of Tobacco	.135**	.006	.088**	.009	.007
Use of Tobacco at School	.119**	-.007	.093**	-.010	.007
Pro-Social Beliefs	-.489**	-.013	-.238**	-.019	.000
Anti-Social Beliefs	.339**	.003	.257**	.023	.006
Attachment to Parents	.000	-.273**	-.022	-.245**	-.240**
Direct Supervision	-.015	-.325**	.005	-.293**	-.263**
Attachment to Peers	.004	.003	-.015	.012	-.018
Attachment to School	.005	-.276**	-.015	-.256**	-.250**
Student GPA	-.019	-.176	-.016	-.209**	-.247**
Commitment to School	.014	-.050	.011	-.091**	-.104**
Involvement in School Activities	-.054**	.014	-.051*	.007	.013
Involvement in Community Activities	-.048**	.039**	-.026	.032**	.022
Impulsivity	.005	.233**	-.003	.224**	.244**
Perceived Injustice	.049**	.310**	.022	.271**	.231**
Perceived Risk of Victimization	.114	.023	.202**	.020	.006
Actual Victimization	.034**	.251**	.063**	.211**	.174**
Teacher Hostilities	-.098**	-.002	-.089**	-.004	.010
Peer Hostilities	.025	.003	.030	.008	-.005

Bivariate Relationships between Dependent and Independent Variables --Females Cont...

Variables	Binge Drinking	Frequency of Alcohol Use	Problem Drinking	Problem Drinking over Time	Frequency of Marijuana Use
Age	.000	.254**	.001	.258**	.179**
Race	-.015	-.010	.031	.002	-.012
Number of Times Moved	.024	.058**	.026	.273**	.069**
Opportunity to Obtain Alcohol	.008	.268**	.002	.223**	.132**
Opportunity to Obtain Tobacco	.007	.329**	.008	.289**	.215**
Opportunity to Obtain Marijuana	.001	.355**	.017	.321**	.301**
Opportunity to Obtain Drugs	-.011	.139**	.007	.153**	.107**

177

Bivariate Relationships between Dependent and Independent Variables -- Females Cont....

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Binge Drinking				
Frequency of Alcohol Use				
Problem Drinking				
Problem Drinking Over time				
Frequency of Marijuana Use				
Frequency of Drug Use	1.00			
Frequency of Smoking	.000	1.00		
Smoking Dependency	.031	-.630**	1.00	
Tobacco Use over Time	.326	.032	-.029	1.00
Delinquent Peers	.191**	.006	.037	.417**
Family Use of Tobacco	-.011	.046	.008	.011
Use of Tobacco at School	.007	-.002	-.001	-.012
Pro-Social Beliefs	.020	-.001	.039	-.012
Anti-Social Beliefs	.005	-.032	-.015	.011
Attachment to Parents	-.137**	-.043	.043	-.287**
Direct Supervision	-.160**	-.035	.038	-.283**
Attachment to Peers	-.044**	-.020	.038	-.022
Attachment to School	-.178**	-.010	.051	-.271**
Student GPA	-.148**	-.017	.021	-.294**
Commitment to School	-.054**	.071	-.047	-.133**
Involvement in School Activities	-.011	-.011	.018	.022
Involvement in Community Activities	.009	-.026	.046	.015
Impulsivity	.213**	.025	-.030	.295**
Perceived Injustice	.155**	.029	-.078*	.248**
Perceived Risk of Victimization	.005	-.042	.014	-.011
Actual Victimization	.204**	-.029	.058	.207**
Teacher Hostilities	.011	.010	-.011	-.008
Peer Hostilities	-.008	.008	.002	-.011

178

Bivariate Relationships between Dependent and Independent Variables -- Females Cont....

Variables	Frequency of Drug Use	Frequency of Smoking	Smoking Dependency	Tobacco Use over Time
Age	.015	.016	-.015	.138**
Race	-.014	-.010	-.016	.039**
Number of Times Moved	.015	-.003	-.008	.099**
Opportunity to Obtain Alcohol	.103**	-.031	.073*	.139**
Opportunity to Obtain Tobacco	.114**	-.002	.032	.263**
Opportunity to Obtain Marijuana	.151**	.000	.036	.262**
Opportunity to Obtain Drugs	.126**	.023	.017	.106**

179