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THE IMPACT OF PARENTAL MONITORING ON DELINQUENT BEHAVIORS

By

Byung Hyun Lee

A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

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ABSTRACT

THE IMPACT OF PARENTAL MONITORING ON DELINQUENT BEHAVIORS

By

Byung Hyun Lee

Previous studies of juvenile delinquency suggest that various family factors influence youth engagement in delinquent behaviors. Although there are numerous causes of delinquency among youth, research indicates that the role of parental supervision and the parents' presence in the children's daily lives decrease the probability of delinquent behaviors. Using Hirschi's social bond theory (1969), the purpose of this cross-sectional study is to examine the effect of parental monitoring on adolescent engagement in delinquency and substance use based on the National Longitudinal Survey of Youth 1997, a nationally representative sample of adolescents. In addition, the study investigates the aspects of family structure and peer influence and its effect on the two outcomes. The multivariate regression results reveal that parental monitoring was not foremost predictor of delinquency and substance use among other correlates. Instead, the variables associated with family structure and peer influence came out to be the significant predictors of delinquency as well as substance use. Due to the limitations of a cross-sectional design in establishing causal relationships, future research should conduct a longitudinal analysis including a larger number of variables related to family context.

To my wife Jeong Soo and our son Philip

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CHAPTER I

INTRODUCTION

After the sharp rise in crime during the mid-1980s throughout the early 1990s in the U.S., American society feared that the trend of violence would continue in an upward direction (Butts & Travis, 2002). According to the Uniform Crime Reports (UCR) and National Crime Victimization Survey (NCVS), the overall crime rate sharply increased throughout the 1980s and early 1990s. Nobody expected that America would witness a significant drop in crime in the mid-1990s in most categories of crime and in all geographic parts of the country (Blumstein & Wallman, 2000; Levitt, 2004). Even though scholars debated the causes of the sudden drop in violent crime in the U.S. during the mid-1990s, they came to the consensus that the national trend in violent crime was related in some way to the descending rates of juvenile violence across the country (Butts, 2000). Today, researchers assert that the recent decline in most categories of violent crime was related to dropping rates of juvenile crime (Butts, 2000; Blumstein & Wallman, 2000; Snyder & Sickmund, 2006)

This apparent downward trend in juvenile crime is partly illustrated by the decline in juvenile arrests. As indicated by a recent research report of youth violence in America from 1980 to 2000, of the 14 million arrests made by law enforcement agencies, 17 percent included juveniles under the age of 18 – a significant decrease from previous years (Butts & Travis, 2002). According to the report by Butts and Travis, between 1994 and 2000, juvenile arrests for murder were reduced by 68 percent, arrests for burglary and robbery by juveniles were down 33 percent and 51 percent respectively, and juvenile arrests for auto theft dropped by 42 percent (Butts & Travis, 2002). Hence, the rate of decline in juvenile crime between the years 1994 and 2000 was conspicuous, particularly in four main categories of the Violent Crime Index such as homicide, forcible rape, aggravated assault and robbery (Butts & Travis, 2002). Despite the conjecture about plausible reasons for the sharp increase of crime in the 1980s and early 1990s as well as the steep decline in the mid to late 1990s, a majority of scholars seem to agree that the effect of fluctuation in juvenile population was associated with the varying rates of crime (Butts & Travis, 2002; Blumstein & Wallman, 2000).

According to Juvenile Offenders and Victims: 2006 National Report, although there has been a steady increase in violent crime by youth beginning the mid-1980s, there has also been constant decline in the same category since the mid-1990s (Snyder & Sickmund, 2006). For example, the report shows that between the years 1994 and 2002, the number of murders by juvenile offenders fell 65 percent to its lowest level since 1984. Moreover, the use of marijuana had declined from 1997 to 2004 for school youth in 8th, 10th and 12th grade (Snyder & Sickmund, 2006). Although these measures may not reflect the true picture and magnitude of juvenile crime, it illustrates a comprehensive depiction of the trends and levels of crime committed by adolescents across the nation in the last decade.

Assuming that the problem posed by violent juvenile crime persists, the need for further study of the correlates of adolescent delinquency such as family characteristics will increase as the juvenile population grows. According to a report by the U.S. Census Bureau (2001), the population of juveniles grew through 2002 and projects that it will continue to escalate steadily throughout first half of the 21st century. The Census Bureau (2001) estimates that it will increase 14 percent between the years 2000 and 2025 and, by

2050, the juvenile population will be 36 percent larger than the figure in 2000. The escalation of the juvenile population conveys implications for future juvenile crimes and it is an issue that cannot be neglected as more adolescents reach their years of crime-prone ages.

In seeking the causes of juvenile delinquency, research looked into parenting behaviors and parental influence on children. Hirschi's social bond theory has been at the core of the criminological research and has received a high level of empirical support in examining the relationship between social bond and delinquency. Using Hirschi's social control theory, the purpose of this study is to examine the effect of parental supervision on adolescent engagement in delinquency based on the National Longitudinal Survey of Youth 1997 (NLSY 97), a nationally representative sample of adolescents. This study will also take into account the youth's gender, race, family income, peer influence, and living with parents to create a broader picture of the relationship between parental supervision and delinquency. By understanding the influence of parental supervision on child delinquency, scholars, practitioners and policy-makers will be able to better assess the relationship between these two variables and, in turn, produce polices that help to prevent delinquent behaviors and to mitigate its related risks.

CHAPTER 2

A REVIEW OF THE LITERATURE

Control theories argue that people will commit crimes if they do not develop normative social bonds. Furthermore, individuals may still engage in criminal behaviors due to various influences such as biological, social or psychological influences. The control theory seeks to explain why individuals do not engage in deviant behaviors rather than why they do. The control perspective argues that most people do not commit criminal acts if they are strongly bonded to social institutions such as family and "controlled" by their influence that inhibit them from criminal activities; the social bond formed could curb deviant behaviors. However, if the individuals fail to form the strong bond to significant others, especially to family, they are likely to engage in criminal activities.

Among the control theories, Hirschi's social bond theory (1969) is one of the most frequently investigated frameworks for empirical examination in the literature on the parent-child relationship and delinquency (Vold, Snipes, & Bernard, 2002). Since Hirschi's publication of *Causes of Delinquency* (1969), control theories have arguably led the way for criminological research (Vold, Bernard, & Snipes, 2002). While the concept of social control can be discussed in different theoretical models, Hirschi's concept of social control (1969) centers around the family as the main source for reducing delinquency.

Studies have attempted to explain delinquency by focusing on family influence and parenting (Elliot et al., 1979; Patterson, 1982; Cernkovich & Giordano, 1987; Laub & Sampson, 1988; Krohn, 1986; Thornberry, 1987). The dimensions of the family process concept, such as attachment, involvement, quality of parent-child relationship, and supervision, serve as core elements of social control theory by Hirschi (1969). They are fundamental to social bonding interactions that take place in human relationships. particularly in parent-child relationships. A number of studies illustrate the role of family and parents in curbing delinquency and substance use (Barnes et al., 2006; Cernkovich & Giordano, 1987; Fletcher et al., 2004; Jensen & Brownfield, 1983; Krohn, 1974; Loeber & Stouthamer-Loeber, 1986; McCluskey & Tovar, 2003; McCord, 1991; Oxford et al., 2000; Rankin & Wells, 1990; Taylor, 1985; Wasserman et al. 1996; Weintraub & Gold, 1991; Wells & Rankin, 1988). Attachment and involvement of parents are the two elements of social control that are conceptually closely related to parental control, whether it is direct or indirect control (Wells & Rankin, 1988). A prime example of parental control or regulation included in a number of related studies is parental supervision or monitoring (Petit et al., 2001; Wells & Rankin, 2006). The terms, monitoring and supervision, seem to be used interchangeably in the literature. This study specifically investigates the relationship between parental supervision and delinquent behaviors of the adolescents. Hirschi's social theory suggests that parental monitoring will be predictive of adolescent outcome variables like delinquency and substance use. As a theoretical framework, the social bond theory is discussed in greater detail below.

I. Hirschi's Social Bond Theory

Hirschi (1969) provides theoretical discussions and empirical analyses of his social bond theory. Like most control theorists, Hirschi's theory also rests on the Hobbesian supposition that human beings are not innately programmed to conform to social norms or rules, but rather guided by primitive instincts and hence "naturally capable of committing criminal acts" (Hirschi, 1969; Wiatrowski, Griswold, & Roberts, 1981). One of Hirschi's fundamental propositions is that there is an inverse relationship between social bonds and delinquency (Hirschi, 1969). Hirschi emphasized that delinquency can be restrained by the social bonds that children develop in prevailing social order (Hirschi, 1969; Nye, 1958; Gottfredson & Hirschi, 1990). It assumes that delinquent behaviors occur when the individual's bond to society is weak or broken. In theory, Hirschi makes the claim that adolescents and young adults are likely to conform to societal norms and parental expectations.

According to Hirschi (1969), the concept of social bond consists of four elements – attachment, involvement, commitment, and belief. Hirschi (1969) argued that these four elements, independently and collectively, constituted significant barriers to adolescent's delinquent behavior. The children's attachment to parents is the most crucial among the bonds, including peers or teachers (Hirschi, 1969). *Attachment* includes the emotional bonds of the child to the significant others such as parents, peers, and teachers. If a child is not attached to others, he or she may be insensitive to other people's emotions and to norms set by others. Family environment is the foundation upon which a strong positive attachment could be built to serve as a barrier to delinquency (Jensen & Brownfield, 1983). *Involvement* is when a child is engaged in conventional activities with close acquaintances, or is associated with healthy organizations or activities such as youth groups, which not only allow children to pursue conventional goals and values but also to conventional goals within the community he or she is part of. *Belief* refers to when a

child is able to believe in the norms and values established by community that helps the child to refrain from delinquent choices.

The underlying assumption of Hirschi's account reinforces the argument that delinquent behaviors occur when a child's bond to family or society is weak. If the bond of affection to the family is strong, the attachment formed may be able to deter criminal behaviors. The theory implicitly states that the stronger this bond, the higher the likelihood the child will internalize the social norms and make rational considerations when faced with moral dilemmas. As Hirschi's social control theory has received much scholarly attention from criminologists, there have been several empirical studies that tested this theory; many provided empirical support and development and some contested its supposition and questioned its validity.

In support of Hirschi's account, the study by Krohn and Massey (1980) had a three-fold purpose. First, using data from a sample of more than 3,000 male and female adolescents in six communities of three Midwestern states, they examined the "overall and relative effects" of the four elements of the social bond theory to improve upon the previous limited inquiries that address Hirschi's work. Krohn and Massey (1980) incorporated Hirschi's social bond elements of involvement and attachment to social institutions into the concept of commitment in its operationalization of the variable. Secondly, for their analysis, the measures were divided into major and minor forms of delinquency as well as substance use with a total of four distinct measures, compared to previous research that examined the effects based on scales that illustrate the degree of seriousness for delinquent behaviors. Lastly, gender difference was investigated in regards to the effect of social bond on deviance. Major findings show that among the

three elements, the commitment variable has a stronger correlation with delinquency than either one of the two remaining elements. Regarding the gender difference, results show that their model consistently explains more variance in delinquent behaviors for female adolescents compared to the male adolescents. Despite the modification of the commitment variable, the study on the whole found a moderate level of support for the social bond account by Hirschi.

Another study that examined the social bond theory is the longitudinal study conducted by Wiatrowski et al. (1981), who attempted to test and improve on Hirschi's original model using data drawn from Youth in Transition Study by Bachman (1975) with a sample of 2,212 school boys. In order to concurrently consider how the four elements of social bond operate with respect to delinquency, Wiatrowski et al. (1981) examined three different multivariate models of social control theory that include the four elements of social bond for explaining delinquency: a simple, a complex, and a modified complex model of the social bond. Limitations of the study presented by the authors were the questionable status of causal ordering in their path models and the use of unidimensional measure of delinquency. Despite these limitations, the study produced valuable results; parental attachment have a strong negative relationship with delinquency, as predicted by the social control theory (Wiatrowski et al., 1981). Additionally, the study (1981) provided empirical support for the claim that social bonds are built not only in context of family but also in an educational setting such as schools. These empirical tests of Hirschi's social control theory strengthen the explanatory power of certain elements of social bond, particularly attachment in predicting delinquency among younger adolescents.

The study by Knight and Tripodi (1996) contributes to the collective support for the social bond account. In their empirical test of Hirschi's social bond theory, Knight and Tripodi (1996) applied Hirschi's theoretical argument to a group of 168 severely delinguent juveniles. They interviewed a total of 168 severely delinguent juveniles from a regional detention center in 1993. They focused on the effect of bonding to society in three main areas: attachment to parents, peer association, and school bonding. The key unanticipated finding of this study is that as the juveniles commit more crimes, the attachment to their parents increase. Knight and Tripodi (1996) provide a partial explanation that the population of these severely delinquent youth formed a close bonding with their parents, 70 percent of which have been incarcerated previously. Parallel to Hirschi's idea that strong bonds, including the four elements of attachment, belief, involvement, and commitment, guide youth to conform to societal norms. These severely delinquent juveniles are susceptible to conforming to a deviant subculture, partly through bonding with their deviant parents (Knight & Tripodi, 1996). With their statistical analysis, they conclude that "strong bonds to criminal subculture" influence youth to be less likely to conform to conventional activities and behavior (Knight & Tripodi, 1996).

More recent studies by illustrate that social bond theory continues to be empirically investigated by current researchers (Junger & Marshall, 1997; Sims, 2002; Chapple, McQuillan, & Berdahl, 2005; Rankin, 2006; Booth, Farrell, & Varano, 2008; Ozbay & Ozcan, 2008). Among these latest studies, an inquiry by Junger and Marshall (1997) used Hirschi's social bond theory to test the generalizability of social bond in a interethnic and cross-national context. The research was conducted on a sample of 788

male adolescents originally from Surinam, Morocco, Turkey, and the Netherlands, with all of them residing in the Netherlands. The results reveal that social bond is predictive of general delinquency as well as a variety of delinquent behaviors in each of the four ethnic groups. Four of the most consistent social bonding variables predictive of delinquency were beliefs, school conflict, involvement in unconventional activities, and virtual supervision by family (Junger & Marshall, 1997). Findings suggest that youth involved in delinquency are more likely to have "lower degree of direct supervision by their parents, more conflicts with teachers, more supportive attitudes toward deviant activities and more involvement in unconventional leisure activities" (Junger & Marshall, 1997, p. 212). Although there are limitations concerning validity and generalizability, the study provides empirical support for Hirschi's social bond theory.

In contrast to the studies above, Agnew considers that Hirschi's theoretical application should be reevaluated. In Agnew's longitudinal test (1985) of social control theory using a national sample of male adolescents, the data analysis indicates that variables related to Hirschi's concept of social control explains only a trivial percentage of variation in future delinquent behavior, especially when examining more serious forms of delinquency and among older adolescents. Agnew (1985) also pointed out that only a few studies with limited sample have tested the empirical validity of the social bond theory. Despite the unsettled challenges and criticisms, Hirschi's social control theory continues to be investigated as a theoretical framework by researchers all over the globe (Junger-Tas, 1992; Nagasawa, Qian, & Wong, 2000; Wang, Qiao, Hong, & Zhang, 2002; Burcu, 2003; Ozbay & Ozcan, 2008).

Following the criticisms of his theory's shortcomings, Hirschi collaborated with Gottfredson to provide an alternative explanation for delinquency. The General Theory of Crime by Gottfredson and Hirschi (1990) support the link between social control and self-control under the assumption that supervision by parents not only prevents delinquent behaviors but also trains children to turn away from temptations for criminal conduct on their own. Gottfredson and Hirschi (1990) claim that ineffective child-rearing by parents is the main source accountable for low self-control which leads to delinquent and irresponsible behaviors. Gottfredson and Hirschi (1990) also claim that lack of selfcontrol is a strong predictor of delinquent behaviors. They argue that children brought up in unstructured family environments fail to develop the ability to control and manage their behaviors and consequently are prone to engage in irresponsible behaviors that often involve risks leading to commit crimes. Gottfredson and Hirschi (1990) argued that in order to control deviant behavior and teach children about self-control, parents need to instigate proper monitoring, acknowledge children's deviant behavior, and utilize adequate rewards and punishment. Children will come to realize and internalize the social norms and rules of conduct and acquire a sense of discipline. Although some believe the theory has a limitation in that it does not explain enough variance in criminal behavior compared to other sociological explanations such as social learning and differential association, several studies testing Gottfredson and Hirschi's theory have provided empirical support concerning the relationship between self-control and crime (Evans et al, 1997; Pratt & Cullen, 2000).

II. Conceptualization of Parental Monitoring

Efforts of researchers to analyze family process variables had been multidisciplinary, and many of the studies have conceptualized and operationalized measures of family variables such as parental monitoring in various ways (Canter, 1982; Cernkovich & Giordano, 1987; Van Voorhis, Cullen, Mathers & Garner, 1988). Due to the multidimensional nature of parenting and its varied conceptualization in different disciplines, variables related to social control such as parental supervision, have only had empirically limited tests (Jang & Smith, 1997). There is no consistent way of conceptualizing parental supervision and many of the attempts to do so overlap in parts. Among the studies, a list of the mostly frequently mentioned elements of the conceptualizing parental supervision is the physical presence of a parent in overseeing the child's activities, direct parental control, and the parent's awareness and knowledge about the child (McCord, 1991; Nye, 1958; Warr, 2005; Wells and Rankin, 1998; Wright and Cullen, 2001).

For the purpose of this study, the parental awareness and knowledge will be the main focus because it closely resembles the measurement and conceptualization of the parental monitoring variable in the NLSY 97 dataset. Essentially, it measured how much the parent(s) know about the child's well-being such as the child's school attendance, use of free time activities at home and at school, or feelings towards drug use. In other words, the parental monitoring in the study is generally defined as the extent of knowledge to which parents attempt to give attention to, to track, or control their children's activities, their whereabouts, peers, and adaptations (Dishion & McMahon, 1998; Kerr & Stattin, 2000; Jacobson & Crockett, 2000).

The task of conceptualization is not simple because it may be difficult to capture dynamic processes, such as parental control, supervision, or involvement. In particular, the terms of supervision and monitoring seem to be used interchangeably in different contexts. Despite the ambiguous use of these terms, studies have taken steps in conceptualizing parental control, characterizing direct control by parents to comprise of close monitoring, parental supervision, and family guidelines within the household and rational sanctions for non-compliance (Patterson, 1980).

First of all, one of the main elements of the conceptualizing parental supervision seems to be the physical presence of a parent in overseeing the child's activities. For example. McCord (1991) conceptualized parental supervision as the "degree to which the boy's activities after school were governed by an adult." focusing on the physical presence of an adult supervisor. In a similar case, other research characterizes direct adult supervision as the "physical presence of at least one adult" in monitoring the activities of the adolescents (Warr, 2005). Secondly, Wells and Rankin (1998) provide a reconceptualized version of direct parental control, constructing from Nye's (1958) concept of direct control, that include the following three elements: normative regulation, which is a process in which parents set the standards for the children's behaviors; monitoring which refers to supervision by the parents to confirm whether children abide by the guidelines set; and discipline which involves applying the idea of punishment and rewards depending on the compliance to the rules. This conceptualization includes not only the aspects of supervision but also dimensions of disciplining and regulating the children's behaviors. Lastly, Wright and Cullen (2001), in their recent study that consists of measuring for direct parental control, include three dimensions, which are parental supervision, parental expectations of the child, and parental household rules.

Monitoring also consists of the parent's awareness and knowledge about the child's well-being such as the child's school attendance, use of free time activities at home and at school, or feelings towards drug use (Snyder & Patterson, 1987). Nonetheless, parental monitoring is generally defined as the extent of knowledge to which parents attempt to give attention to, to track, or control their children's activities, their whereabouts, peers, and adaptations (Dishion & McMahon, 1998; Jacobson & Crockett, 2000; Kerr & Stattin, 2000; Snyder and Patterson, 1987).

III. Parental Monitoring and Delinquency

In the criminological literature, various elements of family influence, including family structure, relationships and process have been examined for their impact on hindering delinquent youth behaviors (Gottfredson & Hirschi, 1990; Gove & Crutchfield, 1982; Larzelere & Patterson, 1990; Wells & Rankin, 1988). Different dimensions of family influence such as attachment, supervision or control were identified as significant determinants of delinquency among other important correlates (Barnes & Farrell, 1992; Fletcher, Steinberg, & Williams-Wheeler, 2004; Krohn, Stern, Thornberry & Jang, 1992). In particular, parenting variables such as attachment, involvement, and monitoring have been found to significantly influence delinquency (Glueck & Glueck, 1962; Larzelere & Patterson, 1990; Wells & Rankin, 1988).

In examining the relationships between family variables and delinquency, studies report that discipline, supervision, protection and affection tends to be absent in

households where delinquents reside (Gottfredson & Hirschi, 1990; Warr, 2005). For example, in a longitudinal study conducted by Oxford et al. (2000), adolescents from "prosocial" family environments, structured with rules, monitoring and attachment had a lower probability of initiating substance use, demonstrating a significant negative effect even while controlling for the deviant peer influence. In the well-known study by the Gluecks (1968), they contended that three factors were significant within the household: parental supervision, child-parent attachment, and parental discipline. Their findings reveal that when the parents failed to provide supervision and proper disciplining, the children were more likely to engage in delinquent behaviors. On the whole, research indicates that the parental supervision and the parents' involvement in the children's daily lives may play a significant role in altering the outcome in their delinquent behaviors (Larzelere & Patterson, 1990; Loeber & Stouthamer-Loeber, 1986; McCord, 1991; Nye, 1958; Taylor, 1985). Additionally, evidence reveals that higher levels of parental support and monitoring may reduce the levels as well as the trajectories of adolescent problem behaviors; furthermore, the effects may buffer the influence of peer deviance (Barnes, Hoffman, Welte, Farrell & Dintcheff, 2006). Moreover, Sampson and Laub (1994), in their reanalysis of the study by the Gluecks, found that there is a strong relationship between parental monitoring and delinquency.

A majority of the studies support the claim that parental supervision or monitoring is negatively associated with delinquency (Steinberg, Fletcher, & Darling, 1994; Ary et al., 1999; Jacobson & Crockett, 2000; Pettit et al., 2001). Among the studies covering parental supervision, it is generally perceived that if parents fail to monitor children's disruptive behaviors, they will have the liberty or opportunity to associate with

delinquent peers who in turn tempt them into criminal conducts (Patterson, Reid, & Dishion, 1992). In a study that examined the relationship between parenting and children's antisocial behavior, low levels of monitoring and supervision turned out to be one of the significant explanations of delinquency, particularly among young male adolescents in urban setting. (Wasserman et al., 1996).

Studies view that parental supervision is a proper strategy for parents seeking to restrain youth from engaging in delinquent conducts, in particular substance use (Fletcher, Darling, & Steinberg, 1995, p. 270). Snyder and Patterson (1987) also confirm the positive effect of supervision, that it "fosters appropriate parental reaction to antisocial and delinquent behaviors." Studies also suggest that effective parenting techniques can protect against child's peer deviance; children whose parents exercise control on their activities and their peer relationships commit less serious and less frequent delinquent acts than others (Hirschi, 1969; Rankin & Wells, 1990; Dishion et al., 1991; Dishion & Mc Mahon, 1998; Jang & Smith, 1997). Hence, monitoring seems to be an important parenting aspect associated with positive adjustment for children. Overall, these studies have made the clear statement that parental supervision efforts "work protectively by keeping youths away from deviant peer contexts and out of trouble" (Kerr & Stattin, 2003).

Concerning the effect of supervision and peers, it is perceived that if parents fail to monitor adolescents with disruptive behaviors, they will be exposed to the influence of delinquent peers, leading to their own engagement in antisocial or criminal behaviors (Patterson, Reid, & Dishion, 1992). However, if parents are constant supervisors of their children's daily activities and behaviors, it is more likely that the monitoring will help to prevent the children from being influenced by deviant peers. In short, parental monitoring is important in discouraging delinquent behaviors and averting the potential association with peers who engage in deviant acts.

CHAPTER 3

DATA AND METHODOLOGY

I. Research Hypotheses

H_1_A: Youth with strong parental monitoring are less likely to engage in delinquent behaviors than those without it.

H_1_B: Youth with strong parental monitoring are less likely to be involved in substance use than those without it.

H_2_A: Youth with supervision by mother are less likely to engage in delinquent behaviors than those without it.

H_2_B: Youth with supervision by father are less likely to be involved in substance use than those without it.

H_3_A: Youth with positive peer influence are less likely to engage in delinquent behaviors than those without it.

H_3_B: Youth with positive peer influence are less likely to be involved in substance use than those without it.

H_4_A: Youth with negative peer influence are more likely to engage in delinquent behaviors than those without it.

H_4_B: Youth with negative peer influence are more likely to be involved in substance use than those without it.

H_5_A: Youth who are living with both parents are less likely to engage in delinquent behaviors than those do not.

H_5_B: Youth who are living with both parents are less likely to be involved in substance use than those do not.

II. Data Collection

<u>Data</u>

The data used for this study is called the National Longitudinal Survey of Youth 1997 (NLSY97), designed by the United States Department of Labor, consisting of seven rounds of data collected from 1997 to 2003. The NLSY97 survey is sponsored and directed by the U.S. Bureau of Labor Statistics and conducted by the National Opinion Research Center at the University of Chicago, with assistance from the Center for Human Resource Research at The Ohio State University (Bureau of Labor Statistics, 1997). The dataset used for this research was downloaded from the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan.

The survey was designed to create a nationally representative sample of approximately 9,000 male and female adolescents with age range of 12 to 16 when first interviewed in 1997. The major purpose of the NLSY97 data was to collect extensive data on youth labor market behavior and educational experiences. However, the actual content of the NLSY97 is greatly broader due to the interests and concerns of Bureau of Labor Statistics and other governmental agencies, including United States Department of Justice (USDOJ), Office of Juvenile Justice and Delinquency Prevention (OJJDP) and the National Institute of Child Health and Human Development (NICHD). With the sponsorship of these agencies, various set of questions such as delinquency, criminal activity, health, family dynamics and individual behaviors are included in the selfadministered portion of the youth questionnaire.

Two core samples were drawn in this national survey which comprised of a crosssectional sample representing the U.S. youth population born in the years 1980 through

1984 and supplemental samples of the African-American and Hispanic population born in those years. During the initial survey round in 1997, the cross-sectional sample contained 6,748 respondents and is designed to be representative of the youth living in the United States. The supplemental sample of 2,236 respondents was designed to be collected by a procedure of oversampling the African-American and Hispanic youths living in the United States during the initial survey round and born during the same period as that of the cross-sectional sample. Overall, the NLSY97 sample allows researchers to analyze the experiences and behaviors of the population as a whole and alternate group of Hispanics and Blacks.

Sample

The specific dataset used for this study was the dataset for the year 1997 collected in round 1. The main reason for selecting the dataset of round 1 was due to the dropping retention rates after round 1 in 1997. After the initial survey round, some NLSY97 respondents did not respond to one or more following interviews. The list of reasons for non-interview included deceased, not locatable, technical problem, illness of respondent, unavailability, refusal of interview.

The round 1 survey in 1997 was conducted by using three separate questionnaires which were the 'Screener, Household Roster, and Non-Resident Roster questionnaire,' the 'Parent questionnaire,' and the 'Youth questionnaire.' The 'Screener, Household Roster, and Non-Resident Roster questionnaire' was distributed to a household resident above the age of 18. The 'Parent questionnaire' was given to a parent or parental figure of the youth who resides in the household. The 'Youth questionnaire' was handed out to

the youth respondent residing in the household. As a data collection tool, a computerassisted interview called CAPI was used to conduct the survey. The interviews were largely conducted as in-person, and telephone interviews were conducted occasionally.

In terms of data collection, the 'Youth questionnaire,' as a main questionnaire, was administered to every youth respondent for each round of the survey. The one-hour lasting interview gathered detailed information on topics of school activities, employment history, family background as well as financial characteristics, social behavior, and health issues.

The purpose of the 'Screener, household roster, and nonresident roster questionnaire' was to collect the basic information (e.g. name, age, birth date) of each resident in the household. When an eligible youth was selected, a two-part roster questionnaire was given to the youth respondents. First, the household roster part gathered information on every member residing in the youth's household. Second, the nonresident roster part collected data on the individuals related to the youth's immediate family who resided outside of the household; examples would be parents, siblings, or spouse. These screening interviews were also conducted only in round 1, despite updates on some parts of the survey in the later rounds.

The parent interviews were conducted only in round 1, distributing the 'Parent questionnaire' to one parent of every youth for participation. The purpose of this 'Parent questionnaire' was to gather and provide wide-ranging background information. The parent interview contains responses to questions regarding marital history, employment as well as information related to the family and youth. During the screening process, the selection limited the criteria to parents who actually reside with the youth in the same

household. Moreover, interviewers created a list for choosing the preferred parent respondent. For instance, the biological mother was selected ahead of the biological father. If the youth respondent did not reside with a parental figure or resided with a parent or guardian who was not listed, parent interview was not conducted. It should be noted that not all youth respondents with an eligible parent will include a fully completed parent questionnaire due to non-response. Out of a total of 8984 youth respondents, 88.4 percent (7942) of them have information for parent interview.

In additional to the questionnaires and instruments used for the survey, special data collections in the NLSY97 study included high school surveys, the computeradaptive form of the Armed Services Vocational Aptitude Battery (CAT-ASVAB) administered only in round 1, and the gathering and coding of academic transcripts. In particular, school survey questionnaires were designed with a focus on topic of school-towork transition for round 1 of the study. In 1996, these questionnaires, as mail surveys, were delivered to all public and private schools located in one of the primary sampling units. It should be noted that school surveys in round 1 was considered a census of schools in the primary sampling units. The school surveys requests information regarding the characteristics of student body, programs for students, and delinquency-related reports such as alcohol or drug use, weapons possession, and gang activity.

Sampling Procedure

In terms of sampling procedure, the NLSY97 data comprises two independent probability samples, which are the cross-sectional sample and the oversample of African-American and/or Hispanic respondents. In the process of selection, a list of housing units

for the cross-sectional sample in the first phase and the oversample was drawn from two independently selected, stratified multistage area probability samples. Its purpose was to ensure an accurate representation of different portions of the population defined by race, income, and other demographic variables. In selecting a sample of 8,984 respondents, interviewers screened 75,291 households in 147 primary sampling units that did not overlap. For this study, a primary sampling unit was a either metropolitan area or single or group of county for non-metropolitan areas.

In terms of data collection, a broad range of information in the NLSY97 had been gathered through several different survey instruments. For the purpose of properly identifying and screening the eligible youths for the survey, the instruments of screener, household roster and nonresident roster questionnaire was used to collect demographic information on household residents and key nonresident relatives during the initial survey round. With use of several questionnaires and the computerized version of the Armed Services Vocational Aptitude Battery (CAT-ASVAB), the survey was conducted as a face-to-face interview in the households. The youth questionnaire, which was administered in each round for an hour, contains topics pertaining to the youth's employment history, school experience, family background, health, and attitudes and behaviors. The parent questionnaire in round one interviewed one of the youth's parents or the caregivers about the family's history and structure for half-hour as well as about key features of the parent's own life for an hour. School surveys and transcripts collected information in several rounds about schools in the sample areas and the academic records of the youths. In addition, the survey used a computer-assisted personal interviewing (CAPI) system, which automatically and efficiently guides respondents to follow certain

question paths depending on age of respondents and responses to preceding questions. The main purpose of this system was to enhance the face-to-face data collection method and to lower the probability of inconsistency of the data, both during interviews and in the full collection period, compared to the outcomes of traditional interviews using paper and pencil. To assure completeness of the questionnaires, the respondents were provided cash incentives; the youth and their corresponding parents received ten dollars for their participation in each round.

III. Variables

Dependent Variables

Two dependent variables will be analyzed in this study. First is the delinquency score index, which examines whether or not youth is involved in delinquent incidents. Second is substance use index, which looks into whether or not the youth has a history of substance use. According to the youth report, both indexes were created, using questionnaires distributed to youth aged from 12 to 16 years.

First, delinquency was measured by an index composed of a modified form of items developed by Del Elliot (1983) to measure delinquency and criminality in the National Youth Survey (NYS). Ten question items contain topics of running away, gang membership, possession of gun or drugs, theft, assault and arrests, as the response were dichotomous (0=No, 1=Yes). The delinquency score index was created by summation of the responses from the number of delinquent/criminal acts the youths identified having ever done through the youth report, for a possible total score of 10. According to the youth report, higher scores indicate more incidents of delinquency.

It should be noted that scores on the delinquency index were attained if respondents answered at least eight of the ten question items. Those youth who answered at least eight of the ten questions were assigned a weighted score based on the 10-point scale, whereas youth who answered less than eight question items were coded as missing. For this scale, there was a trivial percentage of missing data. Out of 9007 cases, only 15 were considered missing; its mean was 1.33 and standard deviation was 1.84.

Secondly, substance use was measured by an index comprising items modified from National Survey of Family and Households (NSFH-2) in which the youth questionnaires were given to those aged from 10 to 17. The three question items include topics of use of cigarette, alcohol and drugs, as the responses were dichotomous (0=No, 1=Yes). The substance use index score was created by adding the number of substances the youth reported having ever attempted for a possible total score of 3. According to the youth report, higher scores indicate more incidents of substance use.

It should be noted that scores on the substance use index were obtained from only those respondents who answered all three question items, whereas respondents who answered fewer than three items were coded as missing. There was only little missing data for this scale; out of 8999 cases, only 23 were considered missing; its mean was 1.02 and standard deviation was 1.33.

For the two dependent variables, they were recoded into dichotomous variables in order to run a logistic regression. Originally, the range of delinquency was from 0 to 10. However, due to its highly skewed distribution, the delinquency variable was coded into a binary category. For substance use, its previous range was from 0 to 3, but was coded

into a binary variable. Table 1 illustrates how the variables were coded and percentage of each response.

			Variable Coding	Percentage		
Ι.	Depen	dent Variables				
	a.	Delinquency	0=No delinguent incident	46.6		
			1=At least one incident of			
			delinquency	53.2		
			999=Missing	0.2		
	h	Substance Use	0=No substance use	46 4		
	0.	Substance ese	1 = At least one use of substan	 100-		
				53 3		
			999=Missing	0.3		
TT	Indon	andont Variables				
1.	Indep	Monitoring by Mother	0=No Monitoring	41.2		
	а.	Monitoring by Motion	1=Monitoring	58.8		
			. momoning	20.0		
	b.	Monitoring by Father	0=No Monitoring	53.0		
	0.		1=Monitoring	47.0		
	c. Monitoring by both Mother & Father					
			0= No Monitoring	54.1		
			1=Monitoring	45.9		
	d.	Living with Bio. Parent(s)	00=No Bio. Parents	6.5		
			01=Only Bio. Father	5.6		
			10=Only Bio. Mother	36.7		
			11=Both Bio. Parents	51.2		
			999=Missing	0.0		
TT	Dama	ananhia Variahlas				
	опал.	Age (Vouth)	12=12 years old	197		
	a.	rige (Toum)	12 = 12 years old $13 = 13$ years old	20.1		
			14=14 years old	20.5		
			15=15 years old	20.5		
			16=16 years old	18.8		
				10.0		
	b.	Gender (Youth)	0=Male	51.2		
	5.	/	1=Female	48.8		
	с.	Race (Youth)	0=Non-White	40.9		
			1=White	58.2		

Table 1:	Descriptive	Statistics an	d Variable	Coding (NI	LSY 1997)
LADIC L	Descriptive	Dratistics an		Country	

(Table 1 continued)

		999=Missing	0.9
d.	Parent Education	Range =	0-7
		Mean =	2.54
		Standard Deviation=	1.37
e.	Household Income	Range =	0-246,474
		Mean =	44084.68
		Median =	37750.00
		Standard Deviation=	36267.39
f.	Positive Peers	Range =	4-20
		Mean =	12.11
		Standard Deviation=	2.89
g.	Delinquent(Negative) Peers	Range =	5-25
0		Mean =	11.09
		Standard Deviation=	4.77
	1)		

(Table 1 continued)

Independent Variables

Study by Martens (1997) found that parental knowledge of children's whereabouts has a significant effect on delinquency and antisocial behavior for youth both boys and girls. The variable 'parental monitoring' in this study is composed of four questions regarding the parents' (both father and mother) awareness and knowledge of children whereabouts. In a study that examined the relationship between parenting and children's antisocial behavior, low levels of monitoring and supervision turned out to be one of the significant explanations of delinquency, particularly among young male adolescents in urban setting. (Wasserman et al., 1996).

In support of social control theory (Hirschi, 1969), parental monitoring is analyzed as a major variable of this study. Parental monitoring, either by residential or non-residential parents, is measured by source of items that comprise standard questions used widely by the recognized researchers of the family contexts (Hetherington, Cox, &
Cox, 1982; Maccoby & Mnookin, 1992). The four question items include "How much does he/she know about your close friends, that is, who they are?", "How much does he/she know about your close friends' parents, that is, who they are?", "How much does he/she know about who you are with when you are not at home?", and "How much does she know about who your teachers are and what you are doing in school?" These responses were measured on a 5-point scale, from 0 to 4. The report consisted of youth aged from 12 to 14 years.

In terms of scale created for measuring the parental monitoring, a scale was created for each of the four possible parental figures. Those figures are residential mother, residential father, non-residential biological mother, and non-residential biological father. The responses to the four items were added up so that the scores would range from 0 to 16 points. According to the youth reports, it is indicated that higher scores account for greater parental monitoring. In effect, the parental monitoring scale illustrates the awareness of the youth's activities by parental figures

It is noted that respondents who answered three of the four items were given a weighted score based on the 16-point scale, but respondents who answered less than three items were coded as missing. However, detailed codebook shows that there was a very small amount of missing data. In examining the reliability of the scale, results of Cronbach's alpha for these scales were measured and considered satisfactory (Bureau of Labor Statistics, 1997). Research suggests that Cronbach's alpha is the preferential measure of reliability or internal consistency (Carmine & Zeller, 1985).

For the monitoring variables, there are three separate variables. First would be the monitoring by mother. Originally, the monitoring by mother was divided into residential

and non-residential mother. However, they were added and recoded into a combined variable to include for the all types of mother. Second would be the monitoring by father. It was also recoded as a newly created including residential and non-residential. Furthermore, among the independent variables, another important variable would be the family structure variable, specifically focusing on whether or not the youth is living with a biological parent(s). This variable was also added up and created to comprise four categories to represent the residence of mother and/or father in the youth's household. It is a important consideration because it provides not only the percentage of youth who are living with their biological parent(s) but also a exploration point of how a family structure could be associated with a family function variable such parental monitoring.

Regarding the family structure variable ('Living with biological parent(s)'), in the round 1 dataset (for 1997) there were originally two dichotomous variables that indicated whether the youth was 'living with a biological mother' or 'living with a biological father' measured as either 'yes' or 'no.' However, the two variables were added up and recoded into a four category variable that conveyed the four types of family structure. Those categories are 'living with both biological parents,' 'living with only biological mother,' 'living with only biological father,' 'living with no biological parent.' The first category of 'living with both biological parents' was selected as a reference category because of its considerable frequency. This family structure variable was considered as the 'main'' variables along with the three monitoring variables in order to examine the association between the family structure and family function aspects. The two different sorts of family variables may provide further insights or explanations when analyzing the correlates of delinquency and substance use. For example, the effect of monitoring by a

parent within an "intact" family environment would be different from that within a "nonintact" family household.

Demographic Variables

Main demographic characteristics of the sample will be controlled for the purpose of eliminating spuriousness during the data analysis. Those variables are age, gender, race, parent education, household income, and peer influence. Age was partly limited that its range was from 12 to 16. Gender and race were also included as essential variables. Parent education and household income were selected to control for the socioeconomic status of the parent because it may likely have an impact on the monitoring skill of a parent. In terms of coding, level of education for father and mother were added together to create a newly combined variable representing level of parent education as a whole. Additionally, two types of peer influence were included as peer influence, which is considered one of the highly recognized correlates of delinquency and substance use in the criminological literature. Specifically, those are the positive and delinquent (negative) peer influence. For the positive peer influence, 4 peer characteristics were added up and recoded into a new variable; its range is 4 to 20. For the negative peer influence, 5 peer characteristics were added up and recoded into a new variable; its range is 5 to 25.

In regards to the age-crime relationship, age is certainly correlated with crime. The age-crime distribution describing the increasing criminal involvement to a peak in the years of adolescence and afterwards decreasing with age is well-known in the criminological literature (Hirschi & Gottfredson, 1983). This age-crime relationship was claimed to be invariant across historical periods, geographic locations, and crime types

(Hirschi & Gottfredson, 1983). Critics pointed out the overstatement of the age-crime relationship and the invariance of age effect, but the impact of age in crime is still considered one of the most important correlates associated with crime (Steffensmeier et al., 1989). Although this cross-sectional study is supported by Hirschi and Gottfredson (1983), longitudinal research would allow one to examine the causation by establishing the order of factors (Vold, Bernard, & Snipes, 2002).

Regarding the relationship between gender and delinquent behavior, research reveal that girls tend to be more emotionally attached to and controlled by their parents compared to boys; this may explain that girls have lower rates of delinquency (Giordano & Cernkovich, 1997; Svensson, 2004). Also, in the criminological literature, it is perceived that males are more aggressive and more often engage in delinquent or criminal activities, compared to females. Peer influence has been frequently mentioned in the literature as one of the significant predictors of youth delinquency (Warr, 1993; Krohn, 1994).

CHAPTER 4

DATA ANALYSES AND FINDINGS

I. Methods of Analysis

Three analytic strategies were used to explore the impact of the independent variables on the pair of dependent variables. Firstly, univariate statistics will be presented for all independent and dependent variables, including demographic variables. The descriptive statistics illustrates the percentage and variable coding for each variable in the whole sample. It also indicates that the missing cases for all variables were recoded as '999' in the SPSS program as 'user-defined.'

Secondly, a bivariate analysis will be conducted to examine the relationship between the independent and dependent variables through the display of contingency tables. Chi-square tests of independence are generally used to investigate the relationship between two discrete variables that comprise binary or multinomial distributions (Bachman & Paternoster, 2004). Chi-square analysis will allow testing for the independence of a selected set of independent variables and the two dependent variables. Moreover, T-tests will be used to test for continuous variables such as income.

Lastly, multivariate statistics will presented by using the logistic regression technique to analyze the dataset and to examine the relationship between parental monitoring and delinquency. Logistic regression will be used because the two dependent variables are binary. The study will analyze three models through the logistic regression. The first basic model will examine only the monitoring variables and family structure variable such as living with one's biological parent(s). The second model will include the two types of peer influence (positive and negative peer influence) resting on the first

model. The third model will use the full list of variables, including all demographic variables. All three model are conducted for the two dependent variables (delinquency and substance use). Prior to running the logistic regression, the study will also check for the possible multicollinearity issues with the use of collinearity diagnostics available through the SPSS program.

II. Findings

Bivariate Statistics

Bivariate analysis was performed to examine the relationship between two selected variables. The relationship was tested whether it was significant or not. For the chi-square analysis, the measure of association was either Phi or Cramer's V values to illustrate the associations of all the independent to the dependent variables (Bachman & Paternoster, 2004). Tables 2A and 2B illustrates the summary statistics of bivariate analysis of the independent variables by the two dependent variables. Most of the bivariate relationships are fairly consistent with the hypothesized statements supported by the criminological theories, except the examples between monitoring by father and delinquency / substance use.

Variables associated with Delinquency

Table 2A shows considerable support for the social bond theory. Youth with no monitoring were more likely to engage in delinquent acts, compared to youth who were monitored. However, this was only true for youth who were monitored by only mother and by both parents. The monitoring by only father did not yield to be significant.

Overall, the family structure variable, living with biological parent(s), came out to be significant. Presumably, youth who resided with both parents were less likely to be delinquent, compared to 3 other family structures. But, it is interesting to view that youth residing with only biological mother were most likely to be delinquent among all 4 cases. The well-known age-crime curve supports the findings that youth who were 16 years old were most likely to be delinquent as youth crime peaks when reaching the age of 16. In terms of gender, male adolescents were more likely to engage in delinquent activities than female counterparts. Race did not yield a significant outcome. For the level of parent education, it was generally true that the higher the parents' education, the less likely the youth's delinquency. With regards to the two types of peer influence, the more positive peer influence youth receives, the less likely the youth will become delinquent. Moreover, the more negative peer influence youth receives, the more likely the youth will lured into delinquent acts. All of these significant relationships are consistent with the criminological literature.

Variables		Number	Percent of
		of Cases	Delinguency
	All Cases	8984	53.2
Parental Monitoring			
Monitoring by Only Mother	No Monitoring	3688	58.9
	Monitoring	5281	49.4
	Chi square		77.813***
	(Cramer's V)		(.093)
Monitoring by Only Father	No Monitoring	4753	58.3
	Monitoring	4216	47.7
	Chi square		1.022
	(Cramer's V)		(.107)
Monitoring by Mother & Father	No Monitoring	4846	58.3
	Monitoring	4123	47.5

 Table 2. Percent of Delinquency by Parental Monitoring, Parental Structure, and

 Demographic Characteristics

	Chi square		1 046***
	(Cramer's V)		(108)
	(Clamer S V)		(.100)
Living with Biological Parent(s) in	Living w/ No	578	60.6
Household	Biological Parent		
	Living w/ Only	499	64.7
	Biological Mother		
	Living w/ Only	3209	57.6
	Biological Father		
	Living w/ Both	4602	48.1
	Biological Parents		
	Chi square		1.138***
	(Cramer's V)		(.113)
Demographic Variables	12 years old	1766	44 7
Age (of Touli)	12 years old	1804	47.8
	13 years old	1826	47.0 55.0
	14 years old	1830	57.9
	15 years old	1601	57.0 60 A
	Chi square	1091	1 707***
	Cin square		(120)
	(Clainer S V)		(.120)
Gender (of Youth)	Male	4588	62.6
	Female	4381	43.6
	Chi square		3.228***
	(Cramer's V)		(.190)
Race	Non-white	3663	53.8
	White	5226	53.1
	Chi square		.411
	(Cramer's V)		(.007)
	()		
Parent Education Level	0	189	45.0
(Mother & Father Combined)		100	
	0.5	199	47.2
		1123	51.3
	1.5	448	54.9
	2	900	55.8
	2.5	/40	54.9
	3	1340	52.0
	3.5	518	54.8
	4	420	JU.I
	4.J	238	53.0 53.0
	у 5 5	240 01	52.0 55.6
	J.J 6	01 07	53.0 54.0
	U 65	ð/ 1 <i>4</i>	J4.U 21 A
	0.3 7	14	21.4 53.3
	/	43	JJ.J
(Table 2 continued)			

	Chi square		21 747***
	(Cramer's V)		(057)
			(
Income	Mean (SD) for Delinquency	45263.6 (37	/315.7)
	Mean (SD) for Non-	43089 8 (35	(154.6)
	Delinguency	1000000 (00	
	T-test		2.831**
Positive Peers	4	33	54.5
	5	66	59.1
	6	141	62.4
	7	250	69.2
	8	410	64.4
	9	660	62.4
	10	919	58.5
	11	1110	56.2
	12	1225	54.3
	13	1125	51.9
	14	921	47.0
	15	713	45.7
	16	501	43.9
	17	297	44.8
	18	158	40.5
	19	75	41.3
	20	35	25.7
	Chi square		1.715***
	(Cramer's V)		(.141)
Negative (Delinquent) Peers	5	1156	31.2
reguire (Derinquent) i cere	6	738	43.2
	7	687	46.3
	8	576	45.0
	9	584	53.1
	10	530	54.2
	11	561	56.7
	12	547	54.3
	13	567	61.2
	14	505	59.8
	15	453	66.4
	16	380	65.0
	17	325	72.9
	18	273	74.4
	19	207	70.5
	20	192	74.0
	21	115	77.4
	22	76	69.7
	23	50	82.0
	24	41	82.9
(Table 2 continued)			

		25	20	75.0	
		Chi square		5.903***	
		(Cramer's V)		(.262)	
** p<.05	***p<.01				

(Table 2 continued)

Variables associated with Substance Use

Table 2B illustrates notably similar results to table 2A. In general, there is considerable difference between youth with no monitoring and at least some monitoring in predicting delinquency. Among the three monitoring variables, monitoring by only mother and by both parents came out to be significant. Regarding the family structure variable, youth who lived with both biological parents were less likely to be delinquent, compared to 3 other family structures. Among the four categories, the youth residing with only biological mother were most likely to be delinquent among all 4 cases. The percentage of delinquency increases significantly as age ranges from 12 to 16. Contrasting to delinquency, the percentages of substance use by male and female youth were relatively close. Contrary to table 2A, race came out to be significant in predicting substance use. White youth were slightly more likely to use substance, compared to nonwhite counterparts. Even though the level of parent education became higher, it was not clear whether substance use by youth declined. In terms of peer influence, there was an inverse relationship between positive peer influence and substance use. For negative peer influence, as negative peer influence increases, the more likely the youth will engage in substance use.

Table 3. Percent of Substance Use by Parental Monitoring, Parental Structure, and Demographic Characteristics

Variables	Number	Percent of	

		of Cases	Substance Use
	All Cases	8984	53.3
Parental Monitoring			
Monitoring by Only Mother	No Monitoring	3685	68 3
Momoning by Only Momen	Monitoring	5085	43 1
	Chi square	5270	5 550***
	(Cramer's V)		(240)
	(Clamer 3 V)		(.24))
Monitoring by Only Father	No Monitoring	4748	63.9
	Monitoring	4213	41.7
	Chi square		4.438
	(Cramer's V)		(.223)
Monitoring by Mother & Father	No Monitoring	4841	63.6
	Monitoring	4120	41.6
	Chi square		4.349***
	(Cramer's V)		(.220)
Living with Biological Parent(s)	Living w/ No	577	567
in Household	Biological Parent	511	50.7
III Household	Living w/ Only	400	64 1
	Biological Mother	477	04.1
	Living w/ Only	3288	58 5
	Biological Father	2200	00.0
	Living w/ Both	4597	48.3
	Biological Parents		
	Chi square		1.075***
	(Cramer's V)		(.110)
Demographic Variables			
Age (of Youth)	12 years old	1765	31.4
	13 years old	1802	41.3
	14 years old	1834	56.2
	15 years old	1872	65.1
	16 years old	1688	73.7
	Chi square		8.384***
	(Cramer's V)		(.306)
Gender (of Youth)	Male	4585	55.5
	Female	4376	51.4
	Chi square		15.072***
	(Cramer's V)		(.041)
Race	Non-white	3660	49 3
	White	5221	56.7
	Chi square		46.946***
	(Cramer's V)		(.073)
	(()

(Table 3 continued)

Parent Education Level	0	188	45.2
(Mother & Father Combined)	^ -		
	0.5	199	43.7
		1123	51.9
	1.5	447	55.3
	2	900	57.7
	2.5	740	55.9
	3	1338	52.8
	3.5	517	55.9
	4	425	49.4
	4.5	238	54.2
	5	246	47.2
	5.5	81	54.3
	6	87	55.2
	6.5	13	53.8
	7	45	48.9
	Chi square		31.247***
	(Cramer's V)		(.069)
Income	Mean (SD) for	44113.6 (3	6039.9)
	Delinquency		
	Mean (SD) for Non-Delinquency	44051.1 (3	6557.2)
	T-test		2.831**
Positive Peers	4	33	63.6
I OSITIVE I CEIS	-+ 	55	03.0 57.6
	6	1/1	68.8
	7	250	65.6
	8	230 410	61.2
	0	-10 660	65.0
	10	010	50.8
	10	1108	57 A
	12	1225	563
	13	1124	53.7
	14	Q1Q	47 2
	15	713	46.4
	16	501	383
	17	296	<u>41 0</u>
	18	158	30 4
	19	75	37 3
	20	35	20.0
	Chi square	55	20.0
	(Cramer's V)		(.170)
Negative (Delinquent) Peers	5	1155	23.7
	6	733	34.2
	7	687	41.6
	8	576	46.0
	5	570	10.0
(Table 7 continued)			

9	584	52.7
10	530	55.5
11	561	59.9
12	548	60.4
13	567	63.5
14	505	69.5
15	451	70.3
16	380	74.7
17	325	74.2
18	273	80.2
19	207	77.3
20	192	77.6
21	115	81.7
22	74	79.7
23	50	82.0
24	41	70.7
25	20	65.0
Chi square		1.094***
 (Cramer's V)		(.357)

** p<.05 ***p<.01 (Table 3 continued)

Summary of the Bivariate Relationships

The findings of bivariate relationships illustrate that there is a significant relationship between majority of the independent variables and delinquency / substance use. For delinquency and substance use, it is shown that there is a significant relationship between the 2 monitoring variables and delinquency / substance use. However, the monitoring by only father variable did not yield to be significant for both dependent variables. It would be logical to figure out the amount of time youth ranged from 12 and 16 years spent with the mother and father. Mothers may tend to spend more time with their adolescents, compared to their fathers. The issue of parent-child communication could also be a factor for the outcome of father's monitoring. After entering the interaction of monitoring by mother and father, the result came out to be significant. One

can assume that the monitoring by mother had an ample effect on the outcome's significance.

On a bivariate level of analysis, 9 and 10 out of the 11 variables examined were significantly associated with delinquency and substance use, respectively. Notably, tables 2A and 2B show that percentage of delinquency and substance use by youth vary with demographic characteristics of the youth and their parents and the peer influences. As predicted in core criminological literature, the bivariate analysis indicates that many of the demographic variables such as age, gender, parent education, and income were related to delinquency and substance use on a national context. While many of the bivariate relationships are coherent with the crime theories, a multivariate analysis would be required to identify which variables have a significant impact on the two dependent variables.

Multivariate Statistics

The bivariate results in tables 2A and 2B illustrated significant relationships between the monitoring / family structure / demographic and the two dependent variables. Yet, these findings reveal significant associations between no more than two variables. In order to further explore more complex interrelationships between variables of interest, this study exploited the multivariate logistic regression. The logistic regression allows researchers to quantify the effect of all selected independent variables on the dependent variable of interest (Bachman & Paternoster, 2004). The quantitative outcomes for delinquency and substance use are illustrated in tables 4 and 5, respectively. For the purpose of logistic regression, the two dependent variables (delinquency and

substance use) were recoded into a set of dichotomous responses. In short, the outcomes were recoded as '0' for 'no' and '1' for 'yes.'

Multicollinearity Diagnostics

In order to check for multicollinearity between the variables, the OLS regression was performed along with the collinearity diagnostics to assess whether collinearity is problematic. Checking for tolerance and variance inflation factors (VIF) is a common way of detecting multicollinearity in statistical analysis. Also, another form of collinearity diagnostics – correlation matrix – was obtained for all independent variables.

Initially, the correlation matrix was examined to check for multicollinearity (See Appendix A). The correlation matrix allows researchers to view how variables are related to each other, particularly between two variables. A high correlation may indicate multicollinearity issue, but it would be necessary to use a more advanced diagnostics method.

Secondly, the tolerance and variance inflation factor (VIF) were taken as measures of collinearity. In general, low values of tolerance and high measures of variance inflation factor (VIF) display signs of collinearity that help determine whether to include a variable or not in the model.

Based on the obtained collinearity diagnostics in Table 3 below, the variance inflation factor (VIF) measures are close to zero and not higher than value of 4.0. However, few variables have tolerance measures that may indicate potential collinearity problem. Table 3 demonstrates that the tolerance measures for all 11 variables came out

to be smaller than 0.10. Moreover, the variance inflation factor (VIF) measures provide

some assurance with multicollinearity.

Independent Variables	В	Tolerance	VIF
Constant	.301		
Monitoring by Mother	106	0.259	3.865
Monitoring by Father	188	0.869	1.151
Monitoring by Both Mother & Father	.068	0.716	1.396
Living with Biological Parent(s)	.806***	0.836	1.196
Positive Peers	048***	0.903	1.108
Negative (Delinquent) Peers	.127***	0.720	1.389
Age (of Youth)	.021	0.252	3.965
Male (compare to Female)	873***	0.982	1.018
White (compare to Non-White)	.230***	0.869	1.150
Parent Education Level (Mother & Father Combined)	.027	0.874	1.144
Income	367	0.828	1.207

Table 4. Collinearity Diagnostics

***p<.01

Note: B value refers to unstandardized coefficients.

Logistic Regression Analysis (Delinquency)

Table 5 presents three models predicting youth delinquency. Table 5 illustrates the results of each variable entered into the three models. Model 1 examined solely the effects of monitoring variables and family structure variables on delinquent behavior by youth. Model 2 displays the effect of monitoring / family structure (living with biological parent) variables on delinquency while controlling for peer influence variables. Finally, Model 3 shows the effect of monitoring / family structure variables on youth delinquency while controlling for peer influence and demographic variables.

For Model 1, the logistic regression coefficients of all variables yielded to be statistically significant predictors of youth delinquency, except for the interaction term of monitoring by both mother and father. The main independent variables, monitoring by mother and by father, came out to be significant in predicting delinquency. Even though the interaction terms (monitoring by both parents) had been statistically significant in the bivariate analysis, it did not yield to be significant in Table 5. Furthermore, the logistic regression coefficients reflecting the effects of monitoring by mother and monitoring by father came out to be expected – a negative relationship. This is in accordance with the hypothesized inverse relationship between parental monitoring and delinquency; the higher the degree of monitoring, the lower the likelihood of delinquency.

Concerning the family structure variable, a significant relationship between the family structure and delinquency is established. A reference group (youth living with both biological parents) is presented along with the three dummy variables that represent the youth's living arrangements (see Table 5). The results reveal that all three living arrangements were significantly related to the adolescent's delinquency. As displayed in Table 5, the odds ratio produced for living with no parent, living with only biological mother, and living with only biological father were 1.548, 2.036, and 1.392, respectively. These values of odds ratio are higher than that of the reference group. In turn, the comparison of the odds ratio indicates that the youth residing in these three types of household structure were more likely to become delinquent, compared to those living with both biological parents. Among the three types of family structure, youth living with only his or her biological mother had the highest odds ratio (2.036). Additionally, the effect of the three types of family structure on youth delinquency was all positive. Overall, model 1 predicts about 3 percent of the variation in delinquency, as indicated by the Nagelkerke Pseudo R-square value.

For Model 2, three of the monitoring variables came out to be insignificant, contrary to model 1. The three monitoring variables are not predictive of the odds of delinquency. However, the peer influence variables were significantly related to delinquency. It can be suggested that the peer influence variables have a stronger effect on delinquency, compared to monitoring by parents (Warr, 1993; Gifford-Smith, Dodge, Dishion & McCord, 2005). The regression coefficients for the two peer influence variables indicate a negative relationship for the positive peer variable and a positive case for the delinquent peer influence. This corresponds to the currently hypothesized relationship between peer influence and delinquency; the more positive peers the youth associates with, the less likely one becomes delinquent. The more negative peers the youth forms relationships, the more likely one becomes delinquent.

Similar to Model 1, the three dummy variables of family structure came out to be significant. The results reveal that all three living arrangements were significantly related to the adolescent's delinquency. These variables are predictive of the variation in delinquency as in model 1 as well as in model 2. As displayed in Table 5, the odds ratio produced for living with no parent, living with only biological mother, and living with only biological father were 1.367, 1.842, and 1.190, respectively. Since the values of odds ratio are higher than that of the reference group, the odds of delinquency among youth living with no parent, only biological mother, and only biological father were higher, compared to those living with both biological parents. Similar to Model 1, among the three types of family structure, youth residing with only biological mother had the highest odds ratio (1.842). Moreover, the effect of the three types of family structure on youth

delinquency was all positive. Overall, model 2 predicts about 10 percent of the variation in delinquency, as indicated by the Nagelkerke Pseudo R-square value.

	Model 1 Model 2		12	Mode	3	
Independent Variables	В	Odds Ratio	В	Odds Ratio	В	Odds Ratio
Family Variables						
Monitoring by Mother	237***	.789	.146	1.157	.265	1.303
Monitoring by Father	580***	.560	148	.863	238	.788
Monitoring by Both Mother and Father	.417	1.518	.025	1.025	.019	1.019
Living with Biological Parent(s)						
(Living w/ No Parent)	.437***	1.548	.312***	1.367	.450***	1.568
(Living w/Bio. Mother)	.711***	2.036	.611***	1.842	.811***	2.251
(Living w/Bio. Father)	.331***	1.392	.174***	1.190	.274***	1.315
(Ref. Category: Living w/ Both Bio. Parents)						
Peers Variables						
Positive Peers			055***	.946	041***	.959
Negative (Delinquent) Peers			.102***	1.107	.127***	1.135
Demographic Variables						
Age (of Youth)					.004	1.004
Male (compare to Female)					968***	.380
White (compare to Non-White)					.10/***	1.182
(Mother & Father Combined)					.055	1.034
Household Income					.000	1.000
Constant	.167***		429***		752	
-2 Log Likelihood	12203.	627	10975.	426	7743.8	29
Model Chi Square	190.812	***	644.160)***	833.305	***
Pseudo R Square (Nagelkerke)	.028	}	.098	}	.168	

Table 5. Logistic Regression Models of Delinquency

** p<.05 ***p<.01

A "full" Model 3 is presented with all thirteen variables included. Similar to model 2, three monitoring variables came out to be insignificant. Hence, the parental

monitoring variables are not predictive of the variation in delinquency when other demographic variables are controlled. On the other hand, the two types of peer influence appear to be significant like those of Model 2. Peer influence variables continue to be strong predictors of likelihood of delinquency among youth, providing statistical support for the current hypotheses concerning the relationship between peers and delinquency. Furthermore, the three dummy variables of family structure came out to be significant. These three family structure variables appear to be predictive of the variation in delinquency in all three models. The odds ratio produced for living with no parent, living with only biological mother, and living with only biological father were 1.568, 2.251, and 1.315, respectively. Because the values of odds ratio are higher than that of the reference group, the odds of delinquency among youth living with no parent, only biological mother, and only biological father were higher than those living with both biological parents. As in all three models, among the three types of living arrangements, youth residing with only biological mother had the highest odds ratio (2.251). Interestingly, the family structure variables displayed dominance over the family function variable such as parental monitoring.

Additionally, several demographic variables – gender, race, and parent education – seem to be significantly related to youth delinquency. Concerning gender issue, Table 5 indicates that the odds of delinquency are 0.380 times higher for males than females. For race, abnormal result shows that the odds of delinquency are 1.182 times higher for whites, compared to non-whites. For parent education, an unusual finding illustrates that the odds of delinquency are higher for youth whose parents' education level was high than those whose parents' education level was low. In contrast, age and income of the

Logistic Regression Analysis (Substance Use)

Table 6 presents three logistic regression models predicting substance use. Model 1 shows solely the effects of monitoring variables and family structure variables on substance use. Model 2 displays the effect of monitoring / family structure variables while controlling for peer influence variables on substances use by youth. Finally, Model 3 shows the effect of monitoring / family structure variables on substance use while controlling for peer influence and other demographic variables.

For model 1 (Table 6) of substance use, the logistic regression coefficients of all variables yielded to be statistically significant predictors of substance use. These results did not lose the significance when compared to the bivariate analysis. The significant findings provide statistical support for the current hypothesized relationship between the parental monitoring and substance use. All three of the monitoring variables came out to

be significant predictors of substance use. For example, the odds of using substance by youth were 0.364 times higher for the youth who were monitored by the mother than those who were not monitored. Also, the odds of substance use were 0.262 times higher for the youth who were monitored by the father than those who were not. Lastly, the odds of substance use were 3.554 times higher for youth monitored by both parents compared to those who were not monitored. Three of the family structure variables also came out to be significant. The findings show that all three living arrangements were significantly related to substance use. As displayed in Table 6, the odds ratio produced for living with no parent, living with only biological mother, and living with only biological father were 1.259, 2.035, and 1.472, respectively. Since the values of odds ratio are higher than that of the reference group, the odds of substance use among youth living with no parent, only biological mother, and only biological father were higher, compared to those living with both biological parents. Among the three types of family structure, youth residing with only biological mother had the highest odds ratio (2.035). The effect of the three types of family structure on youth delinquency formed positive relationships.

Reviewing the logistic regression coefficients of each variable in Model 1, one can observe that the regression coefficients for monitoring by mother and monitoring by father came out to be negative. These negative directions are in conformity with the hypothesized inverse relationship between parental monitoring and delinquency; the higher the degree of monitoring by mother or father, the less likely the juveniles participate in substance use. However, the variable of monitoring by both mother and father came out to be positively associated with substance use. Overall, Model 1 predicts about 10 percent of the variation in substance use, as indicated by the Nagelkerke Pseudo R-square value.

For Model 2 of substance use, three of the monitoring variables came out to be significant, unlike Model 1 of delinquency (Table 6). Thus, the three monitoring variables are predictive of the odds of substance use, even when controlling for the peer influence variables. The regression coefficients for the monitoring by mother and monitoring by father were negative, which confirms that inverse relationship between parental monitoring and substance use. Regarding the logistic regression coefficients in Model 2, the regression coefficient values for monitoring by mother and monitoring by father were negative. Similar to Model 1 of substance use, these negative associations are in line with the hypothesized inverse relationship between parental monitoring and delinquency. However, the variable of monitoring by both mother and father came out to be positively related to substance use. Although this is an odd, interesting result, this occurred in the logistic regression model 1 of substance use as well (Table 6).

Among the three family structure variables, only the arrangement of 'living with no parent' yielded to be insignificant, while the two other single-parent structure variables came out to be significantly related to substance use by young adolescents. This may be interpreted that even though monitoring by parent(s) occurs, the living arrangements of a biological parent may be important in preventing activities of substance use. As shown in Table 6, the odds ratio produced for living with only biological mother and only biological father were 1.745 and 1.239, respectively. Since the values of odds ratio are higher than that of the reference group, the odds of substance use among youth living with only biological mother and only biological father were higher, compared to those living with both biological parents. Similar to Model 1, among

the three types of family structure, youth residing with only biological mother had the highest odds ratio (1.745). Moreover, the effect of the two types of family structure on substance use by youth came out to be both positive.

Notably, the two types of peer influence variable were also significantly related to substance use. Similar to Model 2 of delinquency (Table 5), the regression coefficients for the two peer influence variables indicate a negative relationship for the positive peer variable and a positive association for the delinquent peer influence, which supports the hypothesized relationship between peer influence and substance use. Overall, model 2 predicts about 18 percent of the variation in delinquency, as indicated by the Nagelkerke Pseudo R-square value.

	Mode	Model 1		12	Mode	13
Independent Variables	B	Odds Ratio	В	Odds Ratio	В	Odds Ratio
Family Variables						
Monitoring by Mother	-1.011***	.364	631***	.532	.103	1.108
Monitoring by Father	-1.338***	.262	854***	.426	155	.857
Monitoring by Both Mother and Father	1.268***	3.554	.870***	2.387	.060	1.061
Living with Biological						
Parent(s)						
(Living w/ No Parent)	.230***	1.259	.091	1.095	.174***	1.190
(Living w/Bio. Mother)	.711***	2.035	.557***	1.745	.602***	1.825
(Living w/Bio. Father)	.387***	1.472	.214***	1.239	.394***	1.483
(Ref. Category: Living w/ Both Bio. Parents)						
Peers Variables						
Positive Peers			053***	.949	054***	.947
Negative (Delinquent) Peers			.125***	1.133	.131***	1.140
Demographic Variables						
Age (of Youth)					.277***	1.319
Male (compare to Female)					294***	.745

 Table 6. Logistic Regression Models of Substance Use

White (compare to Non-				
White)			.608***	1.837
Parent Education Level			.014	1.014
(Mother & Father Combined)				
Household Income			.000	1.000
Constant	.600***	280***	-4.954***	
-2 Log Likelihood	11694 646	10350 393	7394 9	52
	11074.040	10550.575	1554.5	
Model Chi Square	648.868***	1248.379***	1161.42)***
Pseudo R Square (Nagelkerke)	.098	.184	.228	

** p<.05 ***p<.01 (Table 6 continued)

For a "full" model 3 of substance use, it included all thirteen variables, presented in Table 6. Contrary to models 1 and 2 of substance use, the three monitoring variables came out to be insignificant. Hence, the parental monitoring variables are not predictive of the variation in substance use when other demographic variables are controlled. However, the three variables for family structure appear to be significant. This presents a similar picture as the logistic regression Model 3 of delinquency (Table 5), in which none of the three monitoring variables yielded significance but all of the family structure variables came out to be significant. It is logical to question why the monitoring variables were insignificant and the family structure variables were significant in predicting the variation in substance use or delinquency when controlling for all other variables.

Concerning the family structure characteristics, the results reveal that all three living arrangements were significantly related to substance use. These variables are predictive of the variation in substance use in all three models. Table 6 shows that the odds ratio produced for living with no parent, living with only biological mother, and living with only biological father were 1.190, 1.825, and 1.483, respectively. Given that the values of odds ratio are higher than that of the reference group, the odds of substance

use among youth living with no parent, only biological mother, and only biological father were higher, compared to those living with both biological parents. Among the three types of family structure, youth residing with only biological mother had the highest odds ratio (1.825). The effect of the three types of family structure on substance use by youth yielded positive relationships.

Similar to Model 2 of substance use (Table 6), the two types (positive and negative) of peer influence continue to be strong predictors of likelihood of substance use. These significant findings provide statistical support for the current hypotheses concerning the relationship between peers and substance use. In addition, several demographic variables such as age, gender, and race came out to be significantly related to substance use. Concerning age of youth, Table 5 illustrates that the odds of substance use are 1.319 times higher for older youth than younger ones. For gender, the result reveals that the odds of substance are 0.745 times higher for males, compared to females. The negative regression coefficients also support that male youth are more likely to engage in substance use than female counterpart. For race, the finding shows that the odds of substance use are 1.837 times higher for whites than non-whites. However, parent education and income yielded to be statistically insignificant.

In summary, youth who are more likely to engage in substance displayed the following characteristics --- youth who are living with no biological parent or single biological parent, who are older, who are males, who are whites, and whose peers are less delinquent and more positive. Among all the variables, the family structure of 'living with only biological mother' and the race of youth proved to be the two strongest predictors of substance use by young juveniles.

Overall, logistic regression Model 3 predicts about 23 percent of the variation in substance use, indicated by the Nagelkerke Pseudo R-square value. As with models for delinquency, the Nagelkerke Pseudo R-square values of explaining substance use also seem to increase as it progresses from model 1 (10 percent) to model 3.

CHAPTER 5

DISCUSSION AND CONCLUSION

I. Summary and Discussion

Summary

After reviewing all of the logistic regression models and tables, two general statements can be made regarding the issues of delinquency and substance use by young adolescents. First would be the outcome of delinquent behaviors. Youth who have the following characteristics are more likely to become delinquent than those who have the contrary --- those who are males, who are living with no biological parent or single biological parent, who are whites, whose peers are less positive and more delinquent, and whose parents' education level are high. Second would be the outcome of substance use. Youth who have the following qualities are more likely to take part in substance use ---- those who are males, who are older, who are whites, who are living with no biological parent. Overall, youth who are males and whites, who are living with no biological or single biological parent, and whose peers are less positive and more delinquent. Overall, youth whose peers are less and more delinquent, are more likely to engage in not only delinquent behaviors but also use of substance. However, the two outcomes did not overlap on the issues on age and parent education.

For the "full" model of delinquency, 'living with biological mother' proved to be the strongest predictor (2.251) of youth delinquency among all the variables. For substance use, two strongest predictors of substance use were evident among all the variables – 'living with biological mother' (1.825) and race (1.837). In terms of explanatory power, the logistic regression models for substance use seem to be higher

than those three models of delinquency. Logistic regression model 3 predicting substance use appears to yield the highest value of Nagelkerke Pseudo R-square (23%).

Overall, for the logistic models of delinquency, family structure characteristics seem to have a dominant effect over other important variables such as parental monitoring and peer influence variables. For models of substance use, family structure and peer influence seem to be more significant cases, compared to those of parental monitoring. In addition, the two monitoring variables (by only single parent) yielded a negative relationship in predicting substance use. However, the interaction term (monitoring by both mother and father) came to form a positive, significant relationship in predicting substance use by youth. This particular effect leads to mixed explanations.

By examining the findings of both logistic models, it demonstrates that other important variables such as peers and family structure may have a stronger effect on delinquency and substance use. Although studies indicate the importance of parental monitoring in reducing levels of delinquent behaviors, an ecological perspective advises against making unwarranted conclusions concerning the comprehensiveness of the parenting variable, as there are different spheres of family-delinquency link such as peer groups and community (Bronfenbrenner, 1979; Jacobson & Crockett, 2000). Studies reveal that family structures such as single parent household are found to be significant predictors of risks for substance use and delinquent behaviors (Demuth & Brown, 2004; Dishion & McMahon, 1998; Van Voorhis et al., 1988). Furthermore, although it is debatable, studies show that peer may have an equal or stronger effect as a predictor of delinquent behaviors compared to parents (Barnes et al., 2006; Elliott & Menard, 1996; Gifford-Smith et al., 2005; Snyder, Dishion, & Patterson, 1986; Sabatelli & Anderson, 1991; Warr, 1993).

Several important findings were obtained from this study. Notably, the impact of parental monitoring was not foremost predictor of delinquency and substance use among other correlates. Instead, the family structure variables came out to be the significant predictors of delinquency as well as substance use among the main independent variables. Moreover, the variables associated with peer influence came out to be the significant predictors of both dependent variables in four of the logistic regression models. While controlling for peer influence and all other demographic factors, the findings did not support the view of social bond theory, particularly parental monitoring as applicable predictor of delinquency and substance. Another noteworthy finding was concerned with the family structure -- whether the youth was living with a no biological parent, a biological mother, a biological father, or both biological parents. Studies support that the claim that parental support and control may be lacking in the single-parent households compared to the households with both parents (Barnes & Farrell, 1992; Gove & Crutchfield, 1982).

In order to examine the invariance of the explanatory variables within the regression framework, one of the frequently employed methods would be to "determine the significance of the difference between two regression coefficients within two independent samples" (Paternoster et al., 1998, p.860). In other words, the purpose of this statistical test is to compare the regression coefficients of the two models and examine the effect of the explanatory variables are invariant across the two outcomes (delinquency and substance use) in the study. In this case, the null hypothesis would be that there is no

difference between the two coefficients in the population. Below is the table for test of invariance of the independent variables in both models of delinquency and substance use. It should be noted that only the independent variables that yield to be significant predictors of delinquency were chosen for this statistical test for the equality of regression coefficients. In Table 7, a z-score above the absolute value of 1.96, whether positive or negative, indicates a significant difference between the two regression coefficients. Overall, all of the variables came out to be significant except the variable of 'living w/ father.' Hence, for the six significant variables, the null hypothesis that no difference exists between the two regression coefficients can be rejected. This proves that the two regression coefficients are not equal. In other words, the impact of the significant variables is greater for outcome of delinquency than for that of substance use, or vice versa.

	Delinquency		Substance Use		
-	В	SE	В	SE	Z-score
Living w/ No Parent	.592	.089	.225	.053	3.54**
Living w/ Mother	.808	.099	.346	.059	4.00**
Living w/ Father	.270	.051	.183	.031	1.45
Gender	873	.042	136	.025	15.07**
Race	.230	.045	.330	.027	-3.70**
Positive Peer	048	.008	030	.005	1.90*
Negative Peer	.127	.005	.075	.003	4.84**

 Table 7. Z-Score of Difference Between Regression Coefficients for Delinquency and Substance Use

NOTE: Unstandardized regression coefficients and z-scores were statistically significant at *p < .05, **p < .01. All of the 7 independent variables are significant itself in the models (Please tables 5 & 6).

Study Limitations

There are several limitations of this study that should be mentioned. First of all, the study did not contain other significant family context variables such parental attachment, parental discipline, parental affection towards the children, or parental conflict. Previous studies examined a variety of variables related to family context (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Barnes and Farrell, 1992; Loeber and Stouthamer-Loeber, 1986; Rankin and Wells, 1990).

Secondly, the data analysis conducted in the study is based on a cross-sectional data. Thus, the significant findings in this study do not provide causal relationships between the independent and dependent variables. Although the main independent variables – parental monitoring and family structure – came out to be significant predictors of delinquency and substance use, it is unclear whether these variables directly predict delinquency. Moreover, a cross-sectional study that uncovered the effect of parental monitoring may not be helpful if the parent is not able to maintain the function of monitoring. In other words, there may be other variables that moderate or interact with the current parenting and family variables in predicting delinquency and substance use. Stouthamer-Loeber and Loeber (1988) suggest that different sets of factors contribute to the different levels of delinquency, rather than the case where a single set of causal factors predict delinquency.

For future research, it may be useful to review the longitudinal study by Klein et al. (1997), which examined the predictors of early adolescence delinquency with a sample 132 Caucasian families. The study included a number of family variables and a type of maternal parenting skill as its main independent variables. Its findings indicate

that maternal communication and problem-solving skills and family variables both 'independently and interactively predict' delinquency during early adolescence (Klein et al., 1997). Due to the limitations of a cross-sectional design in establishing causal relationships, future research should conduct a longitudinal analysis including a larger number of variables related to family context such as those related to family process and structure. This would help in better capturing the dimensions of the specific relationships between the parent and the child within the different family households.

Thirdly, even though the analysis is based on a dataset that is nationally representative, the main methodical issue was the highly skewed distribution and large percentage of missing variables. For the independent variables, the zero values comprised about 40 to 50 percent for the monitoring variables. Moreover, the significance of predictors may be due to the nature of large secondary dataset; those predictors may be not significant if analyzed in a smaller sample.

Lastly, the study utilized the logistic regression technique by recoding the dependent variables into dichotomous ones. Although the logistic regression allows one to examine the simple effect of parental monitoring on delinquency, it does not convey the types and degree of delinquent behaviors. Future research should consider examining the relationship between the different types and degree of delinquency by family function and structure aspects.

II. Conclusion and Implications for Future

Conclusion

The main purpose of this study was to examine the relationship between parental

monitoring and delinquency / substance use. In terms of directionality, the study examined whether monitoring by parents can explain the delinquent behaviors and substance use by young adolescents. Total of eleven variables that have been verified to be strong predictors of delinquency were included in the study analysis. The monitoring variables were supported by empirical evidence testing Hirschi's social bond theory. Importantly, the study contains the investigation of an aspect of family structure. A family structure variable, specifically a component of living arrangements with youth's biological parent(s), was included in the equation as a major independent variable. By including the family structure variable, the study was able to examine the independent contributions of family function and family structure variables to adolescent delinquency and substance use, while controlling for other demographic factors. The family structure variables were considered as the major variables along with the three monitoring variables in order to examine the association between the family structure and family function aspects. However, the proportions of the contribution of each type of family variables are unknown. For example, the effect of monitoring by a parent within an "intact" family environment would be different from that within a "non-intact" family household. Furthermore, by including the peer variables as another significant competing explanation for delinquency, the models were able to provide further insights or explanations when analyzing the correlates of delinquency and substance use (Warr, 2005).

This study also demonstrates the importance of the interaction term by incorporating newly created monitoring variable in the statistical models to examine the effects of interaction between the two monitoring variables, rather than comparing

monitoring by only mother and only father. Although the results do not indicate the significance or the magnitude of an interaction term, but the attempt may be worthwhile in investigating the impact of monitoring by both mother and father on the dependent variables.

Implications for Future Study

The methodological technique used in the current study is suitable for a model with dependent variables that are dichotomous. However, the dependent variables ---delinquency and substance use --- are initially measured as variables with a limited range which can be found in the NLSY 97 dataset. Furthermore, the two dependent variables are considered count data where they represents the number of counts received; delinquency ranging from 0 to 10 and substance use ranging from 0 to 3. Hence, the Poisson regression model using count data may be statistically more adequate for the type of current dependent variables (Cameron & Trivedi, 1998). Future study should examine the effect of family contextual variables (family process, family function, & family structure) as well as peer influence on these two dependent variables by using the Poisson count data model. This will not only increase the rigor of the methodology but also generate sophisticated models for explaining the effects of parental factors on delinquency and substance use.

The findings of the study regarding the main variables are mixed. Albeit the reasonable speculation that family structure and peer variables had a dominant influence over the monitoring variables, the reasons for the insignificance of monitoring variables are still uncertain. Presumably, the weak performance of the monitoring variables on both

outcomes may be attributed to the other contextual influence and social dynamics that may be occurring in the household. Although some of the results for parental monitoring lead to unclear understanding of the family dynamics, it may be constructive to investigate the impact of other family or parenting variables that could account for insignificant results such as marital quality, inter-parental conflict, mother-adolescent and father-adolescent relationship, parental communication skills, and family stressors (Burcu, 2003; Barnes et al., 2006; Bahr, 1979; Cernkovich & Giordano, 1987; Dishion, et al., 1991; Larzelere & Patterson, 1990; Loeber & Stouthamer-Loeber, 1986). While it would be difficult to include a comprehensive set of components related to the family dynamics, future study should attempt to include a wide range of variables that may be accountable for the variation in delinquent behaviors as well as substance use.

Regarding the explanatory power of the models for delinquency and substance use, the results reveal that family structure (living arrangements), peer, and several demographic (gender and race) variables all contribute to the explanation of the relationship between parental influence and child delinquency. However, only small percentage of the effect of parental monitoring is explained. It seems that mechanisms through which family function (monitoring) and family structure (living arrangements) affect delinquent behaviors are complex.
Appendix A. Correlation Matrix (N=8984)

Variables	1	2	3	4	5	6	7	8	9	10	11
Monitoring By	1.00										
Both Parents (1)	1.00										
Monitoring By	70*** 1	1.00									
Mother (2)	.19	1.00									
Monitoring By	0°*** 77*** 1 00										
Father (3)	.90	.//	1.00								
Family Structure	11***	07***	07***	1.00							
(4)	.11	.07	.07	1.00							
Age (5)	67***	85***	68***	02	1.00						
Gender (6)	03*	01	03**	.02	.01	1.00					
Race (7)	.11***	.02	.11***	.09***	01	01	1.00				
Parent Education	07***	03*	07***	06***	03*	01	25***	1 00			
(8)	.07	.05	.07	.00	05	01	.23	1.00			
Income (9)	.11***	01	.11***	.08***	.02	01	.23***	.29***	1.00		
Positive Peer	15*** 14*** 15*** 05*** 17*** 05*** 02* 11*** 14*** 1.00										
Influence (10)	.15	.14	.15	.05	17	.05	.03	.11	.14	1.00	
Negative Peer	$-37^{***} - 39^{***} - 38^{***} - 07^{***} - 47^{***} - 10^{***} - 11^{***} - 07^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{***} - 27^{***} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 27^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**} - 10^{**}$									1 00	
Influence (11)	57	9	38	07	.4/	.10	11	07	10		1.00

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