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The bi-directional relationship between juvenile delinquency and victimization

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The bi-directional relationship between juvenile delinquency and victimization

Abstract
The current study uses longitudinal data to examine the bi-directional relationship between delinquency and victimization and whether this relationship can be explained by possible mediating variables. Using longitudinal data from schools in four New Hampshire communities, results indicate a bi-directional relationship between victimization and delinquency exists such that reported victimizations are associated with increased future reports of delinquency involvement, and involvement in increased types of delinquency is associated with an increased likelihood of reporting experiences of victimization. Analysis is furthered with an examination of various types of delinquency and how the relationship is mediated by depression, self control, and time spent with peers. Results suggest that depression is an important explanatory variable for the relationship between victimization and future delinquency, and that studying the different types of delinquency as separate constructs may enable a deeper understanding of the complex relationship between juvenile delinquency and victimization.

Keywords
Sociology, Criminology and Penology

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THE BI-DIRECTIONAL RELATIONSHIP BETWEEN JUVENILE DELINQUENCY AND VICTIMIZATION

Emily Yearwood

B.A. Sociology, University of Maine, 2010

THESIS

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The current study uses longitudinal data to examine the bi-directional relationship between delinquency and victimization and whether this relationship can be explained by possible mediating variables. Using longitudinal data from schools in four New Hampshire communities, results indicate a bi-directional relationship between victimization and delinquency exists such that reported victimizations are associated with increased future reports of delinquent involvement, and involvement in increased types of delinquency is associated with an increased likelihood of reporting experiences of victimization. Analysis is furthered with an examination of various types of delinquency and how the relationship is mediated by depression, self control, and time spent with peers. Results suggest that depression is an important explanatory variable for the relationship between victimization and future delinquency, and that studying the different types of delinquency as separate constructs may enable a deeper understanding of the complex relationship between juvenile delinquency and victimization.
Chapter I

Background and Significance

Research has long found a relationship between victimization and delinquency. Studies have found a significant overlap in the characteristics and risk factors for offenders and victims, as well as significant correlations between the two behaviors (Agnew 2001; Agnew 2002; Beagle et al. 2011; Gomes et al. 2003; Gottfredson 1981; Hay and Evans 2006; Jensen and Brownfield 1986; Jennings et al. 2010; Klevens et al. 2002; Lauritsen et al. 1991; Maldonado-Molina 2010; Mustaine and Tewksbury 2000; Nofziger 2008; Osgood et al. 1996; Sampson and Lauritsen 1990; Schreck et al. 2004; Schreck et al. 2006; Schreck et al. 2008; Singer 1981; Zhang 2001). Few studies have been able to look at any causal relationship between the two, as most use cross-sectional data rather than longitudinal. This study analyzes two waves of longitudinal data to examine the bi-directional relationship between juvenile delinquency and victimization. This analysis provides a deeper understanding of the relationship between delinquency and victimization and to assess the potential mediating effects of time spent with peers, depression, and self control.
THEORETICAL AND EMPIRICAL BACKGROUND

The effect of delinquency on victimization

Various theories suggest a link between victimization and offending. Three theories are particularly important for explaining the influence that delinquency may have on future victimizations: lifestyle exposure/routine activities theories and sub-cultural theory.

Routine activity and lifestyle theories are very similar, with a key difference being in their original form such that lifestyle theory was developed to account for differential victimization between social groups and routine activities to focus on change in crime rates over time (Miethe and Meier 1994). Lifestyle exposure theory was one of the first theories of criminal victimization that focused on differences in lifestyle that may account for the demographic differences in the likelihood of victimization (Miethe and Meier 1994). The theory places emphasis on specific lifestyles being more conducive to victimization because of the opportunities they present for potential offenders. It focuses on the routine daily activities, including both work and leisure, which are determined socially through role expectations (cultural norms associated with certain statuses) and structural constraints (the social structure and constraints from various institutions) (Hindelang et al. 1978). A key proposition from lifestyle theory is that the "probability of suffering a personal victimization is directly related to the amount of time that a person spends in public places…and particularly in public places at night," and this will vary based on lifestyle (Hindelang et al. 1978: 251).

Routine activities theory argues that victimization is affected by the convergence in time and space of three minimal elements: motivated offenders, suitable targets, and
absence of capable guardians (Cohen and Felson 1979). It places less emphasis on the
cultural element that lifestyle promotes, and focuses more on the interdependence of
victims and offenders as well as the social changes that increase opportunity (Cohen and
Felson 1979). For example, the theorists argue that since World War II, the United States
has experienced more routine activities away from the home rather than in the home,
increasing the probability that motivated offenders and suitable targets will “converge in
space and time” (Cohen and Felson 1979: 593).

Regardless of the specific differences between lifestyle and routine activities
theories, both seek to explain variation in crime not in the characteristics or motivations
of the offender in particular, but in the activities and lifestyles of potential victims and the
presence of offenders in the environment (Miethe and Mieir 1994). Both theories
attribute victimization and delinquency to the environment one is surrounded by and the
daily activities in which one participates, emphasizing the risk of “non household
activity” as increasing the opportunity for criminal victimization to take place (Miethe
and Meier 1994). Involvement in delinquency might heighten the risk for victimization
because, as Sampson and Lauritsen (1990) argue “proximity to violence (i.e. offending)
has positive effects on personal victimization, regardless of individual offense patterns”
(Sampson and Lauritsen 1990: 110).

Other research supports this argument. Jensen and Brownfield (1986) argue,
“offense activity can be considered as a characteristic of lifestyles or as a type of routine
activity, which increases the risk of victimization because of the motives, vulnerability,
or culpability of people involved in those activities” (Jensen and Brownfield 1986: 87).
Furthermore, Osgood et al. (1996) argue that it is unstructured social activity away from
authority figures which brings opportunities that increase the likelihood of deviance as well as victimization. The same environment that is conducive to victimization is also conducive to offending. Some research also suggests that the individuals in those environments provide the peer support for offending as well as elevate the risk of victimization, considering most crime is between acquaintances (Jensen and Brownfield 1986; Shreck et al. 2002).

Building on the arguments of lifestyle and routine activities theories, the relationship between delinquency and future victimizations could be partially explained by an increase in time spent socializing away from home, particularly time spent with peers, resulting in a “greater exposure to motivated offenders, weakened guardianship, and increased attractiveness as a target” (Schreck and Fisher 2004: 1026). As data suggest, juvenile crime is typically committed in groups, and one of the strongest correlates of delinquency is the perceived delinquency of one’s peer group (Akers 1991; Akers 1998; Cohen 1971; National Institute of Justice 2005, Zimring 1981). Sparks (1982) suggests that involvement with peers may present increased opportunities to be victimized. He argues that there may be less likelihood for delinquent peer groups to report victimizations, and therefore an expectation of less police protection (Sparks 1982).

The idea that being delinquent is correlated with increased time spent with non-family others also builds off social learning theory, which has long argued that delinquency is influenced by time spent among deviant others (Sutherland 1947). Sutherland’s (1947) early theory of differential association argues that a person becomes delinquent “because of an excess of definitions favorable to violation of law over
definitions unfavorable to violation of law" learned through interaction with others, particularly intimate others (Sutherland 1960: 127). Akers et al. (1979) extend this theory by pointing to the mechanisms at play which allow for the learning of criminal behaviors, particularly imitation and differential reinforcement. The theory states that individuals will imitate behaviors of intimate others, gain attitudes favorable to crime, and in turn get reinforcement for this behavior (Akers et al. 1979).

Further research has found some support for social learning theory, but critics have argued that it may be a tautological explanation for delinquency. It could be possible that delinquents choose delinquent friends rather than actually learning this behavior from deviant others. Studies examining this have used longitudinal data finding that, although delinquent peers may have an influence on one’s own delinquency, one’s own delinquency also “increases the likelihood of association with delinquent friends” (Cullen and Agnew 2011:120). Results from Rebellon’s (2006) study using data from the National Youth Survey (NYS) found that delinquency was positively related to time socializing, reflecting a “social attractiveness” of a delinquent to peers, but that being with peers did not serve to increase one’s own delinquency (Rebellon 2006: 403). This could serve to explain the relationship between delinquency and victimization, such that delinquents are more likely to spend time socializing away from home and adult supervision, making themselves more vulnerable to victimizations.

Singer (1981) presents an additional explanation for the relationship between delinquency and victimization. Singer (1981) uses a sub-cultural approach, suggesting that, “within subcultures of violence, individuals who attack and victimize others risk retaliation from former victims” (Schreck et al. 2008: 876). This argument is portrayed
in some ethnographic research, such as Elijah Anderson's account of inner-city Philadelphia in "Code of the Street" in which individuals abide by a "code" that demands violent reactions to personal attacks and acts of disrespect (Anderson 1999; Brezina et al. 2005). Increased involvement in a delinquent peer group could also "evoke retaliation in sociocultural contexts that are characterized, in part, by violence and physical aggression" (Schreck, Fisher, and Miller 2004: 24). Lastly, "friends" may prey on each other, seeing each other and each other's possessions as easy targets (Jensen and Brownfield 1986; Lauritsen, Sampson, and Laub 1991; Schreck et al. 2004).

The effect of victimization on delinquency

Other theories focus more specifically on the potential influence of victimization on delinquency. Agnew's General Strain Theory (GST) argues that strains "increase the likelihood of negative emotions like anger and frustration...[which] create pressure for corrective action, and crime is one possible response" (Agnew 2001: 319). GST defines three major types of strain as 1) the actual or anticipated failure to achieve positively valued goals (e.g. bad grade at school) 2) actual or anticipated removal of positively valued stimuli (e.g. significant other breaking up with you) and 3) the actual or anticipated presentation of negatively valued stimuli (e.g. criminal victimization) (Agnew 1992; Lin et al. 2011). Agnew (2001) later revisited GST to discuss this important link between victimization and delinquency, arguing that being victimized is one of the most consequential strains experienced by adolescents. He looked at which events in adolescent life produce the most strain and can be linked to delinquency, finding that strains are most likely to result in crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some
pressure or incentive to engage in criminal coping (Agnew 2001). Victimization fits all four requirements, and delinquency could reflect an attempt to alleviate the negative emotions associated with the strain (Agnew 1992; 2001).

GST states that the mediating forces between strains and delinquency are the presentation of negative emotions, particularly anger and depression, associated with the strain (Agnew 1992; Agnew 2002; Broidy 2001). These negative emotions “create pressure for corrective action and may lead adolescents to (1) make use of illegitimate channels of goal achievement, (2) attack or escape from the source of their adversity, and/or (3) manage their negative affect through the use of illicit drugs” (Agnew 1992: 49). This suggests that strains, such as victimization, may increase the likelihood of being delinquent through the relationship that victimization has with negative emotions, such as depression (Agnew 1992, 2001; Hay and Forrest 2006; Leschied et al. 2008).

In addition to the influence that strains have on negative emotions, there is also an argument involving the notion of self control as set forth by Agnew’s GST (1995). Gottfredson & Hirschi (1990) published “A General Theory of Crime” with the basic argument that all humans are naturally inclined to take part in “crime”. The authors argue that criminal acts are a result of low self control, and ineffective child-rearing is the major “cause” of low self control (Gottfredson & Hirschi 1990:97). The general characteristics of people with low self control are impulsivity, insensitivity, being more physical than mental, being risk-takers, being short-sighted, and being largely non-verbal (Gottfredson & Hirschi 1990:90). The authors argue that these characteristics comprise an individual with low self control, and these individuals are more at-risk to being involved in delinquency. They argue that self control is stable across time, and is largely
fixed after the age of ten. Contrary to the “stability thesis” of Gottfredson and Hirschi (1990), GST suggests that strains such as victimization “increase the likelihood of crime partly because they reduce self control” (Agnew 1995, 2011: 170; Hay and Forrest 2006).

Gottfredson and Hirschi’s (1990) original theory of crime has generated extensive research supporting the argument that low self control is strongly associated with crime, even cross-culturally (Pratt and Cullen 2000; Rebellon, Straus, and Medeiros 2008). Subsequent research has also found low self control to be correlated with victimization (Schreck et al. 2006), and to moderate the relationship between victimization and delinquency, such that the effects of victimization on future delinquency were significantly greater for juveniles with lower self control (Hay and Evans 2006). This notion that victimization as a form of strain is associated with depleted self control could partially explain the link between victimization and delinquency, and will be examined in the current study.
Chapter II

Previous Research

Victimization and Delinquency. Most of the research examining a victim/offender overlap have found the two behaviors to be correlated and have found victims and offenders to share similar characteristics (Agnew 2001; Agnew 2002; Agnew 2011; Beagle et al. 2011; Chen 2009; Gomes et al. 2003; Gottfredson 1981; Hay and Evans 2006; Jensen and Brownfield 1986; Jennings et al. 2010; Klevens et al. 2002; Lauritsen et al. 1991; Matjasko et al. 2010; Maldonado-Molina et al. 2010; Mustaine and Tewksbury 2000; Nofziger 2008; Osgood et al. 1996; Sampson and Lauritsen 1990; Schreck et al. 2004; Schreck et al. 2006; Schreck et al. 2008; Singer 1981; Zhang 2001). The majority of this research uses cross-sectional data to examine a correlation between the two concepts at one point in time, with much of it finding the two concepts to be strongly related (Agnew 2002; Gomes et al. 2003; Gottfredson 1981; Jensen and Brownfield 1986; Klevens et al. 2002; Lin et al. 2011; Mustaine and Tewksbury 2000; Nofziger 2008; Osgood et al. 1996; Schreck et al. 2004; Singer 1981). Although this correlation was at once groundbreaking, it is now commonly known in the literature that many victims and offenders share various similar characteristics and lifestyles (Gottfredson 1986; Hindelang 1979; Jennings et.al 2010; Maldonado-Molina et al. 2010; Mustaine and Tewksbury 1998; Mustaine and Tewksbury 2000; Schreck et al. 2006; Schreck et al. 2008).

Although studies have found considerable overlap between the two concepts, there is research pointing out important differences. Cuevas et al. (2007) distinguished
between three main groups: delinquent-victims, those primarily delinquent, and those primarily victims. Findings identified victims who had minimal involvement in delinquency, as well as delinquents who had “very modest victimization profiles” (Cuevas et al. 2007: 1598). These results demonstrate that it is important to recognize that delinquents and victims are not entirely overlapping. While recognizing this is important, a considerable portion of their sample was labeled by the authors as overlap delinquent-victims (23%) suggesting that it is a significant concept to study (Cuevas et al. 2007).

Few studies have gone beyond studying the overlap to examine explanations for the relationship between delinquency and victimization. Two notable studies have used longitudinal data to examine the one-way relationship between victimization and future delinquency, both finding victimization to predict later involvement in delinquency (Agnew 2011; Hay and Evans 2006).

Hay and Evans (2006) found violent victimization to significantly predict later involvement in delinquency, even when controlling for prior delinquency. Further analysis found self control to act as a moderator for this relationship, showing the effects of victimization were greater for those with low self control (Hay and Evans 2006: 261). Agnew (2011) suggests self control as a mediating mechanism between victimization and delinquency, such that victimization may actually reduce self control, resulting in an increase in delinquency. Agnew (2011) finds support using Gang Resistance Education and Training (GREAT) data revealing that victimization reduces self control in the near term, thus helping to explain why prior victimization may increase subsequent victimizations and offending. The findings suggest that self control may not be as stable
as Gottfredson and Hirschi (1990) argue, and that victimization may be a potential cause of delinquency through the mechanism of lowering self control. Neither study looked at the reverse effect of delinquency on victimization.

In support of these longitudinal findings, other studies have found some support that repeated instances of strain serves to \textit{reduce} self control, with the argument that self control may actually be like a muscle which “tires after repeated use” (Agnew 2011: 170; Hay and Forrest 2006; Muraven, Pogarsky, and Shmueli 2006). Muraven et al. (2006) found self control to be capable of being depleted, and found students with depleted self control to be more likely to cheat. Hay and Forrest (2006) found a portion of their respondents to experience “substantial absolute and relative changes in self control even after age 10” (Hay and Forrest 2006: 739).

In addition to support for the mediating effect of self control, research has found support for Agnew’s (1992) claim that strains such as victimization are associated with both depression (Beyers and Loeber 2003; Barchia and Bussey 2010; Fagen et al. 1987; Turner, Finkelhor, Ormrod 2010) and anger (Broidy 2001). Depression in particular has been found to be a “serious mental health problem among youth” (Lin et al. 2011: 196; Petersen, Compas, and Brooks-Gunn 1992), and has been associated with delinquency in the form of substance use (Fagen et al. 1987; Flannery et al. 1998). Studies show victimization as having significant direct effects on depressive symptoms (Turner et al. 2010), as well as partially mediating the relationship between violent victimization and delinquency (Lin et al. 2011). Manasse and Ganem (2009) studied the mediating and moderating effect of depression on the relationship between victimization and delinquency using a measurement of trait depression, asking respondents whether they
have ever felt depressed in their lifetime. Results indicate that trait depression is
correlated with both delinquency and victimization, and moderates the relationship such
that “those reporting trait depression were more likely to respond to victimization with
delinquent behavior” (Manasse and Ganem 2009: 375). This measurement of trait
depression does not allow an examination of the impact that victimization has on
depression, so results from this study cannot be used to infer that depression mediates this
relationship. Furthermore, no known studies have examined the relationship between
victimization and delinquency with the inclusion of violent, property, and verbal
instances of victimization, nor have any studied the effect of victimization on total
delinquency as well as specific types of delinquency (substance use, property, and violent
deviance) to see if the relationship exists beyond its studied relationship with substance
use.

It is more common in sociology and criminology to explain crime in general,
rather than disaggregate delinquency into various types and forms, such as property and
violent. Proponents of the generality of crime, such as Gottfredson and Hirschi (1990),
suggest that criminal behaviors reflect a single underlying construct. For Gottfredson and
Hirschi (1990), this is all a manifestation of low self control. Rebellon and Waldman
(2003) study this claim with results suggesting that crime, or “acts of force and fraud”, do
not reflect the manifestation of a single latent construct, such as low self control. Past
studies that have differentiated between various types have found important results,
suggesting that there may be important differences. Cuevas et al. (2007) examine the link
between victimization and offending, finding different trajectories to occur. Results
indicate individuals who are primarily property offenders, and others who are primarily
violent offenders, with different outcomes in terms of victimization (Cuevas et al. 2007). This study builds on this debate to examine whether victimizations are associated with a specific type of delinquency, and whether the mediating mechanisms between these relationships may work differently based on the type of delinquency being studied. It could be that depression experienced after being victimized is more likely to result in substance use, as Flannery et al. (1998) suggests, rather than violent or property delinquency. These subcategories of delinquency are important to be able to understand the complexities of this relationship. The current study goes beyond most of the literature by examining these effects using longitudinal data.

Other research has looked at the influence of delinquency on later victimizations, suggesting that offending directly increases the risk of personal victimization (Chen 2009; Lauritsen et al. 1991; Mustaine and Tewksbury 1998; Sampson and Lauritsen 1990). The research tends to use routine activities and lifestyle theories to examine this relationship, suggesting that juveniles who engage in delinquent behavior face higher victimization because of the environments they are in and/or their association with other offenders (Chen 2009; Jensen and Brownfield 1986; Lauritsen et al. 1991; Mustaine and Tewksbury 1998; Sampson and Lauritsen 1990; Zhang et al. 2001). Overall, research has found support for the association between delinquency and victimization, finding that involvement in delinquent lifestyles is associated with increased likelihood of victimization (Chen 2009; Jensen and Brownfield 1986; Lauritsen et al. 1991; Mustaine and Tewksbury 1998; Sampson and Lauritsen 1990; Zhang et al. 2001). Chen (2009) found these results to hold up amidst controls for bonds to parents and school, and to be particularly strong when looking at the most violent victimizations.
Two known studies have looked at the bi-directional relationship between delinquency and victimization using longitudinal data (Begle et al. 2011; Zhang et al. 2001). Zhang et al. (2001) uses data from the Buffalo Longitudinal Survey of Young Men (n= 625). This is a five-year panel study beginning in 1992 which oversamples young men at risk for delinquency, with two waves eighteen months apart present for analysis at the time of this particular study. Zhang et al. (2001) measured deviant lifestyle in terms of three indicators: drinking, drug use, and overall delinquency. The study used 34 items to look at delinquency as a whole, and 13 items each for drinking and drug use. Victimization was measured with nine items: three for violent victimization and 6 for property victimization. Results do not show a bi-directional relationship between deviant lifestyle and victimization- the researchers found a significant lagged effect of deviant lifestyle at wave 1 on victimization at wave 2, but no lagged effect of crime victimization on deviant lifestyle (Zhang et al. 2001). Zhang et al. (2001) did not look at the separate effects of property and violent delinquency on future victimization, nor the reverse effect, which my study will expand on. Furthermore, the study did not examine any possible mediating variables to help explain the relationship between delinquency and victimization, nor did they include data on females (Zhang et al. 2001).

Begle et al. (2011) used a nationally representative sample of 3,614 adolescents between the ages of 12 and 17 to examine the longitudinal association between victimization and delinquent behavior. The researchers used alcohol use, drug use, and delinquent behavior as their measures of “high risk behavior”, combining property crime, violent crime, and minor offenses into “delinquent behavior”, and used experienced and witnessed physical and sexual assault as four separate measures of victimization. Results
using a cross-lagged structural equation model in LISREL show a bi-directional relationship between high risk behavior and victimization, with inconclusive results for gender because “the overall cross-lag model did not provide an adequate fit to the data” for females and there was not a large enough sample for boys experiencing sexual victimization (n=6) (Begle et al. 2011: 86). Begle et al. (2011) had important findings for the bi-directional relationship, but approach the relationship without a theoretical foundation. They do not examine any possible mediating factors that may have important explanatory power.

Although the relationship between delinquency and victimization has been studied for years, the findings thus far have limitations. Few researchers have the longitudinal data to look at a bi-directional causal relationship, and many that do either do not examine the reciprocal relationship or have inadequate data to do so, such as no ability to control for prior delinquency/victimization (Agnew 2011; Chen 2009; Hay and Evans 2006; Jennings et al. 2010; Lauritsen et al. 1991; Sampson and Lauritsen 1990; Schreck et al. 2006). Furthermore, the two known studies that examine a bi-directional relationship do not test for any possible mediating variables.

The present study builds on prior research concerning victimization in three ways. First, it studies the possible differential impact that various forms of delinquency (i.e. property, violent, substance use) may have on victimization. Second, this study approaches the topic with a theoretical lens allowing for an analysis of the possible mediating effects that self control, depression, and time spent socializing may have on the relationship between delinquency and victimization. Finally, the sample contains data on both males and females, allowing for the adequate control of gender. Overall, the current
study allows for a more comprehensive understanding of the complex relationship between victimization and delinquency, and the possibility to understand the mechanisms behind this relationship.
Chapter III

The Present Study

SAMPLE
The study uses data from waves two, three, and four of the New Hampshire Youth Study (Cohn et al. 2010), a longitudinal study of rule-violating behavior in four New Hampshire communities. The study began in the Spring of 2007 involving four communities in Southern New Hampshire with a total of eight middle schools and five high schools. It is a convenience sample because of the protocol required by the Institutional Review Board (IRB), which required parental consent in the form of a signed permission slip from students prior to participation in the survey. The schools were entered six times in a span of three years, each collection six months apart, and only students who returned permission slips were placed into the database. The current study uses data from waves two, three, and four for analysis because of the question availability. Of the 1,040 students who agreed to participate in the study, 929 completed the survey at wave two, 936 at wave three, and 828 at wave four. Cases with missing variables were not included in the analysis.

MEASURES
The present study uses delinquency and victimization as both dependent and independent variables, in addition to a variety of intervening and control variables.

Delinquency. Delinquency is measured using a delinquency index concerning various rule-violating behaviors, including violent assaults, property crimes, and substance use. Respondents were asked to fill in the blank with a number concerning how many times
they participated in each act in the past six months. Following previous studies examining delinquency and victimization, responses to each question were dichotomized into dummy variables, 0 meaning the respondent never participated in that behavior and 1 meaning they have 1 or more times. Responses were then added together to create a delinquency index (Esbensen and Osgood 1999; Osgood and Schreck 2007; Jennings et al. 2010). This method of a variety index eliminated the problems associated with outliers and is widely supported in the literature concerning juvenile delinquency (Hindelang et al. 1981). To enable a closer look at delinquency, the questions were further broken down into three categories: violent, property, and substance use. The total delinquency index included twenty three questions, with the subcategories of violent delinquency consisting of seven questions, property delinquency consisting of eight, and substance use consisting of four questions. The remaining four questions involved other forms of deviant behavior, including ‘taken a handgun to school’ and ‘trying to get something by lying’, and were used in the total measure of delinquency (see Appendix A for questions).\(^1\)

**Victimization.** Victimization was measured using six questions from wave two and five questions from wave four concerning being a victim of physical assault, verbal assault and property crimes.\(^2\) Respondents were asked if they had experienced a range of events

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1 The index consists of a few questions that could potentially overlap one another, such as “gotten into a fight at school” and “committed assault”. Because of this, an additional index of delinquency was created which did not include any items that potentially overlapped. The correlation between the original delinquency measure at wave two with all twenty three measures and the revised measure with only nine items had a correlation of .96, and was found to yield the same results. Rebellon et al. (2012) used the NHYS data in research concerning juvenile delinquency and found using overlapped items in the total measure to yield no differences as well.

2 Wave two included one additional question in order to include all the same measures. In wave two, the question asked if, in the past 6 months, anyone had “hit or attack you WITH an object or weapon” and if anyone had “hit or attack you WITHOUT using an object or weapon”. Wave four did not differentiate, but simply asked if, in the past six months, anyone had “hit or attack you on purpose.”
in the past 6 months, with possible responses "yes" and "no". Similar to the delinquency index, these questions were added together to form a victimization index (see Appendix A for questions).

**Controls.** Various controls were used in this analysis to attempt to rule out a spurious relationship. Four demographic variables were controlled for in the multivariate analysis (age, sex, race, and socioeconomic status). For this research, age was left in interval form with a wave two range of 11 to 17. Race was recoded such that 0 was white and 1 was any other race listed, including Hispanic, African American, Native American, Asian American, Biracial, or other. This was done because the majority of the sample was white (76%), so breaking it down into more than two races would not allow for enough representation of each race on its own. This simple recode will not affect the main focus of the study, but is something to consider for further research. Sex was also recoded into a dummy variable, with 0 being female and 1 male. A measure of socioeconomic status was created based on respondents reporting the education of their parent(s). Respondents were not asked about their parent(s)' incomes, as they are unlikely to know. This method, following Rebellon et al. (2012), was used in order to enable some control for socioeconomic status when lacking a more complex indicator. The question asked each respondent what the highest level of education was for both their mother and father, with possible responses ranging from 1 to 6 (1=less than high-school, 2=high school diploma or GED, 3=some college education, 4=Associate's Degree, 5=Bachelor's Degree, 6=Graduate or Professional Degree). The measure of SES indicates the mean of each parent's educational attainment. If one parent is listed, the SES measure reflected that
specific parent's educational attainment. All demographics were calculated using wave two data.³

**Intervening Variables.** There were three intervening variables tested in this analysis: depression, self control, and time spent socializing. All three measures were calculated using data from wave three, and actual questions can be seen in Appendix A. Depression and self control were tested to mediate the relationship between victimization and delinquency, and time spent social was tested as a mediator between delinquency and future victimization.

A measure of depression was created from seven questions suggesting possible depression, such as "I felt sad" and "I couldn't get going". Respondents were asked how often in the past 6 months they had each feeling or experience, with possible responses Not at all= 0, Occasionally= 1, Frequently= 2, and Almost all the time= 3. The mean response to the seven questions was calculated, with possible scores ranging from 0 to 3, 3 suggesting they felt the symptoms of depression "almost all the time".

The measure of self control was calculated using the widely used Grasmick et al. (1993) scale. The Grasmick et al. (1993) scale asks twenty four questions concerning the six components of low self control: impulsivity, self-centeredness, risk-taking behavior, temper, physicality, and consideration of long-term consequences. Responses were on a likert-scale ranging from 0-3, 0 being strongly disagree and 3 being strongly agree. The

³ It may be noted that there was no control for delinquent peer association. Past research has suggested that measures of the perceptions of peer’s delinquency are simply a reflection of one’s own delinquency, rather than a measurement of a peer’s actual delinquent involvement (Akers 2000; Gottfredson and Hirschi 1990; Rebellon 2012). Unless network data can be used to measure a respondent’s delinquency and compare that to the self-reported delinquency of each respondent’s peers, then this possibility is still in question. For this study, data was not available to do such an analysis. In order to prevent the possibility of “controlling out” the effects of delinquency, a measure of delinquent peer association was absent from the analysis.
A measure created for this analysis uses the mean response for the twenty-four questions, resulting in a range of responses from 0 to 3, with higher numbers indicating lower self control (i.e. 3 = lowest self control).

A measure of routine activities was created in order to test the mediating influence that time spent socializing with peers may have on the relationship between delinquency and future instances of victimization with the argument that involvement in a delinquent lifestyle increases your time spent with peers away from home, which in turn increases the opportunities for victimizations to occur. Respondents were asked how much they agreed with the statements stating “I spend a lot of time with other kids” after school, on weeknights, and on weekends, with possible responses ranging from 1-3, 0 = strongly disagree, 1 = somewhat disagree, 2 = somewhat agree, and 3 = strongly agree. The measure of time spent socializing was created using the mean of responses to these three questions, with possible responses ranging from 0 to 3, 3 suggesting they spend a lot of time with peers.

ANALYTICAL PROCEDURE

The procedure for the present data first involved presentation of the descriptive statistics and bivariate correlations for a general understanding of the data, and to be sure the data are behaving as they should according to other literature. Multivariate analyses were then conducted using negative binomial regression in Stata. Negative binomial regression is used to account for the positively skewed data (see figure 1) and for use with count data, meaning that the data includes non-negative integers. According to the
alpha coefficient’s from each analysis, negative binomial regression was appropriate for these data.\textsuperscript{4}

**Figure 1: Distribution of Wave 2 Total Delinquency**

Analyses were run first using Wave 4 (W4) victimization as the dependent variable and Wave 2 (W2) delinquency as the main independent variable with all demographic controls included. Next, the mediating variables of self control and depression were added separately for the first two models, and together for the third model. Analyses were furthered by examining the influence the various subcategories of delinquency had on victimization, and how these relationships may be mediated by self control and/or depression. The second round of models involved W4 delinquency as the dependent variable with W2 victimization as the main independent variable, with all demographic controls included. The second model included the mediator time spent socializing, with further analysis examining the potential differences victimization may

\textsuperscript{4} The alpha coefficients reported in each model show that negative binomial regression was needed to fit this data versus Poisson regression (see Long 1997). Significant alpha coefficients suggest over-dispersion is occurring, meaning that if Poisson regression was used, the coefficients would tend to have exaggerated levels of significance. The alpha coefficients suggest that negative binomial regression is, in fact, appropriate for these data (see Rebellon et al. 2012).
have on each subcategory of delinquency. A diagram illustrating the theoretical relationships is presented in figure 2.

**Figure 2: Models for analysis of victimization and delinquency**

<table>
<thead>
<tr>
<th>Wave 1 Independent Variable</th>
<th>Wave 2 Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delinquency</td>
<td>Victimization</td>
</tr>
<tr>
<td>Victimization</td>
<td>Delinquency</td>
</tr>
<tr>
<td>Violent Delinquency</td>
<td>Victimization</td>
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<tr>
<td>Victimization</td>
<td>Violent Delinquency</td>
</tr>
<tr>
<td>Property Delinquency</td>
<td>Victimization</td>
</tr>
<tr>
<td>Victimization</td>
<td>Property Delinquency</td>
</tr>
<tr>
<td>Substance Use</td>
<td>Victimization</td>
</tr>
<tr>
<td>Victimization</td>
<td>Substance Use</td>
</tr>
</tbody>
</table>
Chapter IV

Results

SAMPLE STATISTICS AND BIVARIATE CORRELATIONS

Sample statistics and bivariate correlations behaved as expected, with bivariate correlations presented in table 1. The sample is 56% female, and 76% white with about 8% listing Hispanic American as their race, 3.9% listing African American, 3.5% Asian American, and the rest as Native American, biracial, or "other". The age range at W2 is between 11 and 17, with the majority being 12 and 15.

All measures of delinquency and victimization are significantly correlated with each other at the .01 level. Demographic variables also behave as expected. Sex is correlated with both waves of total delinquency as well as violent and property crime. It is not significantly correlated with substance use at wave two or four. Race is significantly correlated with wave two total delinquency, property crime, and violent crime such that being non-white was significantly associated with increased likelihood of reporting increased variety of total delinquency, violent delinquency, and property crimes. Age is statistically significant with w2 and w4 delinquency measures, along with w2 violent crime and w2 and w4 property crime and substance use, such that being older is associated with an increased likelihood of reporting a higher variety of delinquency.

Last, the measure of socioeconomic status, based on respondent reports of parental

---

5 The race variable should be understood in connection with its limitations in the context of the population, which is not nationally representative of race. The sample is 76.5% white, 7.8% Hispanic, and 3.9% black; the national percent is 72.4% white, 16.3% Hispanic and 12.6% black (U.S. Census 2010). Furthermore, race has been clumped together as white and non-white, allowing for true analysis of race as difficult.
education, is positively and significantly correlated with all types of w2 delinquency, w2 victimization, and sex. It is negatively associated with race, suggesting that respondents reporting lower parental education levels are associated with being non-white.

The bivariate correlations of mediator variables are also present in table 1. Results show depression as being positively and significantly correlated with all measures of delinquency and victimization at w2 and w4, as well as with age. Depression is negatively and significantly correlated with gender, supporting previous literature that suggests females are more likely than males to respond to strain with "non-angry emotions such as depression" (Manasse and Ganem 2009: 373). Before examining results concerning self control, it must be understood that the measure of self control has a range from 0 to 3, with a higher number representing lower average self control. That being said, the self control measure is positively associated with all variables listed except race and socioeconomic status, suggesting that having lower self control is associated with increased reports of all types of delinquency and victimization, as well as with age and gender. Self control is negatively and significantly associated with socioeconomic status, suggesting that those reporting lower self control tend to report lower parental education. Self control is not significantly correlated with race.

The final mediating variable, time social, yields telling results. The measure is not significantly related to any demographics. It is related to an increased probability of all types of delinquency, but is not significantly associated with victimization. This shows that, although being delinquent is correlated with more time spent with peers, it does not mediate the relationship between delinquency and victimization.
Table 1: Descriptive and Pearson Product Correlations for Covariates and Delinquency and Victimization

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
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<tbody>
<tr>
<td>1. Delinquency (w2)</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>2. Delinquency (w4)</td>
<td>.473*</td>
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<td>1</td>
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</tr>
<tr>
<td>3. Victimization (w2)</td>
<td>.296*</td>
<td>.287*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4. Victimization (w4)</td>
<td>.231*</td>
<td>.404*</td>
<td>.386*</td>
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<td></td>
<td></td>
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<tr>
<td>5. Violent Del (w2)</td>
<td>.908*</td>
<td>.453*</td>
<td>.327*</td>
<td>.269*</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>6. Violent Del (w4)</td>
<td>.419*</td>
<td>.878*</td>
<td>.271*</td>
<td>.408*</td>
<td>.497*</td>
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<tr>
<td>7. Property Del (w2)</td>
<td>.949*</td>
<td>.458*</td>
<td>.270*</td>
<td>.215*</td>
<td>.800*</td>
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<tr>
<td>8. Property Del (w4)</td>
<td>.430*</td>
<td>.910*</td>
<td>.287*</td>
<td>.358*</td>
<td>.376*</td>
<td>.704*</td>
<td>.464*</td>
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<td></td>
<td></td>
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<tr>
<td>9. Substance Use (w2)</td>
<td>.834*</td>
<td>.359*</td>
<td>.191*</td>
<td>.114*</td>
<td>.632*</td>
<td>.244*</td>
<td>.745*</td>
<td>.313*</td>
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</tr>
<tr>
<td>10. Substance Use (w4)</td>
<td>.392*</td>
<td>.770*</td>
<td>.177*</td>
<td>.269*</td>
<td>.292*</td>
<td>.519*</td>
<td>.374*</td>
<td>.628*</td>
<td>.453*</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>11. Sex</td>
<td>.088*</td>
<td>.147*</td>
<td>.010*</td>
<td>-.045</td>
<td>.123*</td>
<td>.175*</td>
<td>.104*</td>
<td>.134*</td>
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<td>12. Age</td>
<td>.178*</td>
<td>.167*</td>
<td>-.017</td>
<td>.017*</td>
<td>.107*</td>
<td>.029*</td>
<td>.163*</td>
<td>.166*</td>
<td>.283*</td>
<td>.322*</td>
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<td></td>
<td></td>
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<tr>
<td>13. Race</td>
<td>.093*</td>
<td>.030*</td>
<td>.051*</td>
<td>.044*</td>
<td>.099*</td>
<td>.060*</td>
<td>.094*</td>
<td>.019*</td>
<td>.037*</td>
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<td>.063*</td>
<td>-.024</td>
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<tr>
<td>14. SES</td>
<td>-.093*</td>
<td>-.034*</td>
<td>-.118*</td>
<td>-.007*</td>
<td>-.059*</td>
<td>-.010*</td>
<td>-.081*</td>
<td>-.027</td>
<td>-.094*</td>
<td>-.065</td>
<td>.085*</td>
<td>-.023</td>
<td>-.090*</td>
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<td>15. Depression</td>
<td>.172*</td>
<td>.202*</td>
<td>.322*</td>
<td>.363*</td>
<td>.187*</td>
<td>.224*</td>
<td>.137*</td>
<td>.125*</td>
<td>.158*</td>
<td>.184*</td>
<td>-.173*</td>
<td>.073*</td>
<td>.036*</td>
<td>-.062</td>
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<tr>
<td>16. Self Control</td>
<td>.319</td>
<td>.422*</td>
<td>.190*</td>
<td>.305*</td>
<td>.323*</td>
<td>.375*</td>
<td>.296*</td>
<td>.376*</td>
<td>.261*</td>
<td>.369*</td>
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<td>.116*</td>
<td>.026*</td>
<td>-.082</td>
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<tr>
<td>17. Time Social</td>
<td>.125</td>
<td>.153*</td>
<td>-.015</td>
<td>.029*</td>
<td>.096*</td>
<td>.072*</td>
<td>-.120</td>
<td>.151*</td>
<td>.115*</td>
<td>.197*</td>
<td>-.027</td>
<td>.017*</td>
<td>-.029</td>
<td>.016*</td>
<td>-.005</td>
<td>.211*</td>
<td>1</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).
Wave two and wave four delinquency are significantly correlated at the .01 level, as are wave two and wave four victimization. Furthermore, wave two and four delinquency are correlated with self control, depression, and time spent socializing, supporting three major sociological theories and published literature described above (Akers 1998; Gottfredson & Hirschi 1990; Agnew 1992).

CROSS TABULATIONS

Cross tabulations show significant overlap between those who report delinquency and those who report victimization (see tables 2-4). Looking at wave two data in table 2, only 35.4% of those who did not report any delinquency reported some amount of victimization. In contrast, among those who did report some amount of delinquency, 57.1% also reported at least one instance of victimization. This supports previous literature suggesting a significant overlap in individuals involved in both victimization and offending behavior (Jennings et al. 2010; Klevins et al. 2006; Maldonado-Molina et al. 2010; Matjasko et al. 2010; Mustaine and Tewksbury 2000; Schreck et al. 2006).

Table 2: Crosstabulation- W2 Delinquency vs W2Victimization

<table>
<thead>
<tr>
<th>W2 Victimization</th>
<th>None</th>
<th>One or more types</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2 Delinquency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>64.6%</td>
<td>35.4%</td>
</tr>
<tr>
<td>One or more types</td>
<td>42.9%</td>
<td>57.1%</td>
</tr>
</tbody>
</table>
Table 3: Crosstabulation- W2 Delinquency vs W4 Victimization

<table>
<thead>
<tr>
<th>W4 Victimization</th>
<th>None</th>
<th>One or more types</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2 Delinquency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>73.8%</td>
<td>26.2%</td>
</tr>
<tr>
<td>One or more types</td>
<td>47.8%</td>
<td>52.2%</td>
</tr>
</tbody>
</table>

Furthermore, although it suggests significant overlap in those who report both, there are also trajectories for involvement in each as separate concepts (Schreck et al. 2006). As shown in table 3, 26.2% of those reporting no involvement in delinquency reported at least one instance of victimization as compared to 52.2% of those reporting some involvement in delinquency who also reported victimization. Table 4 shows that 33.2% of those reporting at least one instance of victimization report no delinquency at wave 4, but that the majority (66.8%) of those reporting at least one instance of W2 victimization also report at least one instance of delinquency at wave 4. These findings show there are some victims who are not necessarily delinquent and some delinquents who may not be victimized, but that there is significant overlap between the victims and offenders.

Table 4: Crosstabulation- W2 Victimization vs W4 Delinquency

<table>
<thead>
<tr>
<th>W4 Delinquency</th>
<th>None</th>
<th>One or more types</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2 Victimization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>52.1%</td>
<td>47.9%</td>
</tr>
<tr>
<td>One or more types</td>
<td>33.2%</td>
<td>66.8%</td>
</tr>
</tbody>
</table>
MULTIVARIATE ANALYSIS

Negative binomial regression was used in Stata to look at the longitudinal relationship between victimization and delinquency. The first models looked at w4 victimization as the dependent variable, and w2 delinquency as the independent variable (tables 5-10). W2 delinquency is significantly associated with an increase in reported types of victimization, even when controlling for prior victimization and all demographics ($b=.056$). Incidence rate ratios (IRR) show that involvement in one type of delinquency increases the likelihood of also reporting victimization by 105.8%.

Table 5: Effects of w2 delinquency on w4 victimization

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Age</th>
<th>-.021 (.039)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td>-.441 (.134) **</td>
</tr>
<tr>
<td></td>
<td>Race</td>
<td>.123 (.144)</td>
</tr>
<tr>
<td></td>
<td>SES</td>
<td>.027 (.024)</td>
</tr>
<tr>
<td></td>
<td>W2 Victimization</td>
<td>.285 (.040) **</td>
</tr>
<tr>
<td></td>
<td>W2 Delinquency</td>
<td>.056 (.014) **</td>
</tr>
<tr>
<td></td>
<td>Alpha</td>
<td>.799 (.155)</td>
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<tr>
<td></td>
<td>LogLikelihood</td>
<td>-684.56</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>592</td>
</tr>
</tbody>
</table>

** p < .01

Table 6: W2 delinquency vs w3 time spent with peers

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable W3 Time with peers</th>
<th>.024 (.007) **</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2 Delinquency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>779</td>
</tr>
</tbody>
</table>

** p < .01

Table 7: W3 time spent with peers vs w4 victimization

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable W4 Victimization</th>
<th>.033 (.065)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3 Time with peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>762</td>
</tr>
</tbody>
</table>
As shown in bivariate correlations, the measure of time spent socializing with peers was not found to be significantly associated with victimization (table 1). Further analysis supports this, as regression results show w2 delinquency as significantly correlated with higher average time spent with peers (table 6), but time spent with peers is not significantly associated with victimization (see table 7). Therefore, time spent socializing is not included in further analysis of the relationship between w2 delinquency and w4 victimization.

Table 8: Effects of w2 violent delinquency on w4 victimization

<table>
<thead>
<tr>
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</thead>
<tbody>
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<td>-.008 (.038)</td>
</tr>
<tr>
<td>Sex</td>
<td>-.466 (.135) **</td>
</tr>
<tr>
<td>Race</td>
<td>.120 (.143)</td>
</tr>
<tr>
<td>SES</td>
<td>.027 (.025)</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.277 (.040) **</td>
</tr>
<tr>
<td>W2 Violent Delinquency</td>
<td>.161 (.041) **</td>
</tr>
<tr>
<td>Alpha</td>
<td>.792 (.154)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-684.14</td>
</tr>
<tr>
<td>N</td>
<td>592</td>
</tr>
</tbody>
</table>

** p < .01

Table 9: Effects of w2 property delinquency on w4 victimization

<table>
<thead>
<tr>
<th>Model 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.019 (.038)</td>
</tr>
<tr>
<td>Sex</td>
<td>-.451 (.134) **</td>
</tr>
<tr>
<td>Race</td>
<td>.130 (.144)</td>
</tr>
<tr>
<td>SES</td>
<td>.028 (.040)</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.292 (.039) **</td>
</tr>
<tr>
<td>W2 Property Delinquency</td>
<td>.138 (.036) **</td>
</tr>
<tr>
<td>Alpha</td>
<td>.788 (.155)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-684.59</td>
</tr>
<tr>
<td>N</td>
<td>592</td>
</tr>
</tbody>
</table>

** p < .01

Table 10: Effects of w2 substance use on w4 victimization

<table>
<thead>
<tr>
<th>Model 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.019 (.040)</td>
</tr>
<tr>
<td>Sex</td>
<td>-.332 (.130) **</td>
</tr>
<tr>
<td>Race</td>
<td>.145 (.145)</td>
</tr>
<tr>
<td>SES</td>
<td>.020 (.025)</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.318 (.039) **</td>
</tr>
<tr>
<td>W2 Substance Use</td>
<td>.163 (.067) *</td>
</tr>
<tr>
<td>Alpha</td>
<td>.833 (.159)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-689.06</td>
</tr>
<tr>
<td>N</td>
<td>592</td>
</tr>
</tbody>
</table>

** p < .01  *p<.05
Further analysis of the various types of delinquency show similar results.

Involvement in violent crime at w2 is positively and significantly associated with victimization at w4 (b=.161) (table 8). IRRs show the likelihood of being victimized at w4 increases by 117% if involved in violent delinquency at w2. Property delinquency is also a positive significant predictor of future victimization (b= .138) (table 9). Finally, table 10 shows substance use is positively and significantly associated with future victimization (b= .163).

Table 11: Effects of variables on w4 Delinquency

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.096 (.036) **</td>
<td>.073 (.040)</td>
<td>.094 (.037)*</td>
</tr>
<tr>
<td>Sex</td>
<td>.356 (.118) **</td>
<td>.410 (.131) **</td>
<td>.434 (.121) **</td>
</tr>
<tr>
<td>Race</td>
<td>-.069 (.139)</td>
<td>-.025 (.156)</td>
<td>-.135 (.142)</td>
</tr>
<tr>
<td>SES</td>
<td>.002 (.023)</td>
<td>.007 (.026)</td>
<td>-.002 (.023)</td>
</tr>
<tr>
<td>W2 Delinquency</td>
<td>.133 (.017) **</td>
<td>.083 (.017) **</td>
<td>.129 (.017) **</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.145 (.041) **</td>
<td>.152 (.045) **</td>
<td>.110 (.042) **</td>
</tr>
<tr>
<td>Self Control</td>
<td>.827 (.125) **</td>
<td>.349 (.086) **</td>
<td>.755 (.131) **</td>
</tr>
<tr>
<td>Depression</td>
<td>1.37 (.132)</td>
<td>1.22 (.141)</td>
<td>1.29 (.132)</td>
</tr>
<tr>
<td>Alpha</td>
<td>-1092.97</td>
<td>-839.17</td>
<td>-1021.72</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>598</td>
<td>476</td>
<td>568</td>
</tr>
<tr>
<td>N</td>
<td>* p&lt;.05  ** p&lt;.01</td>
<td>** p&lt;.01</td>
<td>** p&lt;.01</td>
</tr>
</tbody>
</table>

The next models examine the influence that w2 victimization has on the likelihood of reported involvement in delinquency at w4. Results suggest experienced victimization at w2 to be a positive significant predictor of delinquency at w4, even when controlling for demographics (b= .145) (table 11). The log likelihood value is -1092.97. Model two finds average self control to be significantly associated with w4 delinquency at the .01 level (b= .827), but not to reduce the b coefficient of w2 victimization (b= .152 with self control in the analysis). Model three examines the mediating effect of depression, finding depression to partially mediate the relationship between victimization and delinquency (b= .349).
Table 12: W2 Victimization vs W3 Depression

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>W2 Victimization</th>
<th>W3 Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td><strong>.157 (.017)</strong> **</td>
<td><strong>760</strong></td>
</tr>
</tbody>
</table>

**p < .01

Analysis shows w2 victimization is associated with increased reported average depression at w3, even when controlling for prior depression (table 12). Including it in the analysis between w2 victimization and w4 delinquency, it is shown to also be associated with delinquency and to partially mediate the relationship. The log likelihood value with depression in the analysis (model 3) is -1021.72. This increase indicates that the model including depression explains more of the variation in delinquency than the model without.

Further analysis looks at the relationship between victimization and different forms of delinquency. Victimization had a positive significant effect on all three subcategories of delinquency (tables 13, 14, 15). The inclusion of depression showed partial mediation for the relationship between victimization and property crime (table 14). Full mediation occurred for the relationship between w2 victimization and w4 violent delinquency (table 13) as well as the relationship between w2 victimization and w4 substance use (table 15) when depression was added into the model. The log likelihoods of all analyses increased when w2 victimization was added, and increased again when depression was added, suggesting that including w2 victimization and then w3 depression increases the explanatory power of the models.
Table 13: Effects of variables on W4 Violent Delinquency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.020 (.051)</td>
<td>-.050 (.053)</td>
</tr>
<tr>
<td>Sex</td>
<td>.579 (.164) **</td>
<td>.649 (.169) **</td>
</tr>
<tr>
<td>Race</td>
<td>.060 (.192)</td>
<td>-.066 (.197)</td>
</tr>
<tr>
<td>SES</td>
<td>.0005 (.033)</td>
<td>-.011 (.033)</td>
</tr>
<tr>
<td>W2 Delinquency</td>
<td>.136 (.021) **</td>
<td>.134 (.021) **</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.165 (.054) **</td>
<td>.105 (.057)</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>.457 (.114) **</td>
</tr>
<tr>
<td>Alpha</td>
<td>1.77 (.282)</td>
<td>1.56 (.268)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-.575.78</td>
<td>-.530.86</td>
</tr>
<tr>
<td>N</td>
<td>598</td>
<td>568</td>
</tr>
</tbody>
</table>

* p<.05
** p<.01

Table 14: Effects of variables on W4 Property Delinquency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.098 (.048) *</td>
<td>.099 (.050) *</td>
</tr>
<tr>
<td>Sex</td>
<td>.305 (.156) *</td>
<td>.378 (.160) *</td>
</tr>
<tr>
<td>Race</td>
<td>-.130 (.186)</td>
<td>-.164 (.190)</td>
</tr>
<tr>
<td>SES</td>
<td>.017 (.031)</td>
<td>.019 (.031)</td>
</tr>
<tr>
<td>W2 Delinquency</td>
<td>.132 (.020) **</td>
<td>.129 (.021) **</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.194 (.051) **</td>
<td>.178 (.053) **</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>.227 (.111) *</td>
</tr>
<tr>
<td>Alpha</td>
<td>1.65 (.250)</td>
<td>1.58 (.252)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-.632.16</td>
<td>-.594.96</td>
</tr>
<tr>
<td>N</td>
<td>598</td>
<td>568</td>
</tr>
</tbody>
</table>

* p<.05
** p<.01

Table 15: Effects of variables on W4 Substance Use

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.365 (.050) **</td>
<td>.374 (.052) **</td>
</tr>
<tr>
<td>Sex</td>
<td>-.098 (.157)</td>
<td>.056 (.163)</td>
</tr>
<tr>
<td>Race</td>
<td>-.220 (.184)</td>
<td>-.277 (.190)</td>
</tr>
<tr>
<td>SES</td>
<td>-.014 (.030)</td>
<td>-.018 (.030)</td>
</tr>
<tr>
<td>W2 Delinquency</td>
<td>.107 (.016) **</td>
<td>.100 (.016) **</td>
</tr>
<tr>
<td>W2 Victimization</td>
<td>.010 (.045) *</td>
<td>.054 (.051)</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>.361 (.106) **</td>
</tr>
<tr>
<td>Alpha</td>
<td>.794 (.199)</td>
<td>.715 (.199)</td>
</tr>
<tr>
<td>LogLikelihood</td>
<td>-.487.16</td>
<td>-.449.88</td>
</tr>
<tr>
<td>N</td>
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<td>568</td>
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</tbody>
</table>

* p<.05
** p<.01
Chapter V

Discussion

Building on previous studies examining the relationship between juvenile delinquency and victimization, the present study used longitudinal data to specify 1) what relationship exists between delinquency and victimization, and whether it may be bi-directional, 2) whether this relationship is mediated by three measures studied in previous theories of victimization and delinquency: time spent with peers, self control, and depression, and 3) whether these relationships exist within subcategories of delinquency.

Analysis indicates a bi-directional relationship exists between victimization and delinquency, such that victimization is associated with increased future reports of delinquent involvement and involvement in increased types of delinquency is associated with an increased likelihood of reporting experiences of victimizations. This relationship exists even when controlling for age, sex, race, SES, and prior victimization/delinquency. This supports previous literature and theories that found this link using different analytic strategies (Begle et al. 2011). Additionally, the current research builds off previous studies by finding a reciprocal lagged effect between both variables (Zhang et al. 2001).

Second, the current study found the relationship between various types of delinquency and victimization to remain even with controls for demographics. W2 violent delinquency, property delinquency, and substance use are all significantly associated with w4 victimization, and w4 victimization is significantly associated with all subcategories of delinquency. This supports the notion "crime is crime": the idea that there is no difference in types of delinquency as it is all a manifestation of one underlying
construct (i.e. self control) (Gottfredson and Hirschi 1990). That being said, further analysis of mediating variables suggests different factors to explain this relationship.

In the analysis of w4 delinquency, w2 victimization was found to significantly predict likelihood of future delinquency (table 13). When depression was added to the model, the relationship was found to be partially mediated by depression. Partial mediation also exists for the relationship between w2 victimization and w4 property delinquency. Full mediation occurred in the models for both w4 violent delinquency and w4 substance use such that the relationship between w2 victimization and w4 violent delinquency and w4 substance use disappeared after depression was included in the model. This analysis indicates that victimization is correlated with increased reported depression, and depression appears to fully mediate the relationship between victimization and future violent delinquency and substance use, but not property delinquency. This builds off previous studies finding victimization to be correlated with future delinquency by indicating depression as an important variable in this relationship, particularly for violent delinquency and substance use. Depression was found to fully mediate the relationship, reducing the coefficient of victimization on violent delinquency by .06 (table 15) and on substance use by .05 (table 17), rendering victimization positive but not significant. Without the breakdown into subcategories of delinquency, this full mediation would not be found (Manasse and Ganem 2009). The results support research suggesting victimization does have an influence on the likelihood of future involvement in delinquency (Agnew 2011; Hay and Evans 2006; Lin et al. 2011; Schreck et al. 2006). Furthermore, these results suggest that victimization is related to substance use through
the increase in average reported depression, supporting previous literature which indicates substance use as a form of coping (Flannery et al. 1998).

In the same series of analyses, self control was not found to mediate the relationship. Although self control is a significant positive predictor of both victimization and delinquency, it was not found to mediate the relationship between the two when included in the model: the explanatory power of victimization did not diminish after self control was included in the model (table 13). This suggests that self control may not mediate the relationship between victimization and delinquency, but may just be correlated with both separately.

In the analyses of w2 delinquency and w4 victimization, time spent with peers is being tested as a mediator between w2 delinquency and w4 victimization. W2 delinquency was found to be significantly correlated with higher average reported time spent with peers, such that those reporting higher involvement in various types of delinquency are correlated with reporting higher average time spent with peers. As depicted in table 9, time spent with peers is not found to be significantly associated with victimization, thus finding the variable to not mediate the relationship between delinquency and future victimizations in this sample. These findings suggest that higher average time spent with peers does not have a significant relationship with experienced victimization. The finding is contrary to the suggestions made by routine activity and lifestyle theorists that suggest time spent with peers may provide an environment that elevates the risk for victimization (Jensen and Brownfield 1986; Shcreck et al. 2002).

That being said, there are limitations to the measurement used in the current study as it has limited information on the environments in which this time with peers takes
place. As shown in appendix A, the questions ask how much respondents agree with the statements “I spend a lot of time with other kids after school”, as well as “on week nights” and “on weekends”. These questions do suggest more time with peers, but do not indicate whether supervision still exists. The existence of supervision by adults is an important factor in routine activity and lifestyle theories as it may reduce risk of victimization by reducing the opportunity that may be present in social activity away from home (Osgood et al. 1996).

Although the hypothesized mediating mechanism between w2 delinquency and w4 victimization was not supported, results do show a significant association. W2 total, property, and violent delinquency significantly predicted w4 victimization at the .01 level, and w2 substance use predicted w4 victimization at the .05 level.

The results suggest a bi-directional relationship that persists regardless of sex, age, race, SES, and prior delinquency/victimization. These results have important implications for understanding the relationship between these two concepts, and the significant overlap in respondents reporting involvement in both. Before discussing the implications that these findings have, it is important to note the limitations of this study.

LIMITATIONS

Although the present study has important implications and insights into the bidirectional relationship between delinquency and victimization, it is essential to address its limitations. First, it is important to be aware that the sample used in this study is a convenience sample. The sample is of 11 to 17 year old youth from various New Hampshire communities, which is not representative of the national population.
Second, the analysis used a variety index to measure involvement in delinquency and victimization. This is not quite a limitation, as it is widely supported in literature and recommended over the use of a frequency scale by some (Hindelang et al. 1981). That being said, it does not allow an examination of frequency of involvement in delinquency or victimization experiences and how that may impact the bi-directional relationship. It could be that frequent victimizations, even if just one type, is related to increased delinquency. The current study did not examine this possibility. That being said, the variety index allowed the study to account for outliers that could skew data. For example, when a frequency table was run for w2 delinquency there were students whose total delinquency was over 12,000. This is probably not an accurate representation; it is more likely to be a consequence of intentional deceit which comes with anonymous self report. Recoding helped to eliminate this issue. Furthermore, the variety index allowed us to gain an understanding of the relationship between victimization and delinquency, such that increased victimization is related to increasing diversity of delinquency, and vice versa.

A third limitation to the data is that measures of victimization did not get at early-childhood victimization experiences, nor vicarious victimizations, as it asked for personal experiences in the past year only. The study mainly focuses on peer victimization, lacking questions that ask specifically about family victimizations or child maltreatment. This limits an understanding of life victimizations as well as the implications that various types of victimization may have. That being said, the current study does enable comprehension of the consequences of victimization on the short term. W2 victimization was related to increased acts of delinquency at w4, even when controlling for
delinquency at w2, along with other important controls. This supports previous findings which suggest that the strain of victimization may increase the likelihood of delinquency in the short term (Agnew 2011; Hay and Evans 2006; Schreck et al. 2006).

A final limitation to be discussed is the lack of certain controls in the analysis. Because of the limitations of the data, there was no way to adequately control for influence of delinquent peers on either victimization or delinquency. As noted above, the method of gaining information on peer delinquency in this survey asked respondents about the delinquent activity of their peers. This method has concerns. As outlined in Rebellon (2012), there is research suggesting that “adolescents who are asked about their friends’ delinquency may misattribute their own delinquency level to their friends…if so, both measures might be alternative reflections of the same behavior” (Rebellon 2012: 2-3, Akers 2000; Gottfredson and Hirschi 1990). Use of network data that uses measures of peer delinquency directly from respondents’ peers rather than the respondents’ perceptions would be more useful and accurate depictions of actual peer delinquency. For this reason, a control for delinquent peer association was not used in this analysis to prevent the variable from inadvertently ‘washing away’ the explanatory power of delinquency itself by essentially measuring the same concept.

IMPLICATIONS

Taking these limitations into consideration, the results of this study have important implications for understanding the relationship between victimization and delinquency, and also lead to many further questions. The results suggest a causal relationship between these two variables when controlling for prior delinquency/victimization and demographics, and cross tabulations show the significant overlap between delinquency
and victimization. Furthermore, analysis of mediating variables suggest depression partially mediates the influence that victimization has on future involvement in property crime, and fully mediates the influence on future violent crime and substance use.

These results have implications for understanding the influence that being victimized and being involved in delinquent activities have on each other. If, as the study suggests, involvement in victimization is directly related to increased involvement in delinquency, outside of prior delinquency and multiple demographic variables, then attention to those being victimized may help to decrease the crime rate. Research suggests that victim services such as counseling may help to decrease adverse effects of the victimization (March et al. 1998; Norris et al. 1990; Weisz and Weiss 1995). One study by Norris et al. (1990) shows victims receiving mental health services report a more rapid recovery from the victimization than those who do not receive services. This is not to say that we should ignore the portion of the population who are victims but not delinquents. As discussed, cross tabulations suggest there is overlap between victims and offenders, but there is still a significant portion of the population who are victims but not delinquents, and vice versa. The results of this study simply suggest that attention should be given to victims in order to increase awareness of the impact that victimization has on not only individual mental health but also on the propensity for future delinquency.

The finding of depression as an important explanatory variable in this relationship can further help this understanding. Victimization was found to directly increase average reports of depression, which in turn increased future involvement in delinquency, particularly violent crime and substance use. The significance of victimization in predicting future delinquency and depression merits greater attention, suggesting more
could be done to focus on increased referral services aimed at those experiencing victimizations. Deepening the understanding of why some youths get involved in delinquency could enable better prevention methods and provide an additional reason to consider childhood victimization as a permeating problem in American society.

The breakdown of delinquency into subcategories enabled the understanding of the explanatory power of depression for violent crime and substance use in particular. This provides value for further analysis of types of crime as potentially separate constructs. Contrary to the notion set forth by Gottfredson and Hirschi (1990) that 'crime is crime' and all are influenced by low self control, this analysis suggests that different mechanisms may be at play for different forms of delinquency. The influence that victimization has on the involvement in property crime does not seem to be fully explained by depression, so other factors may be at play here. It could be telling to examine general strain theory further to test whether the other important negative emotion from GST, anger, mediates this relationship further. It may also be useful to break down victimization into different forms.

Looking at the reciprocal relationship, involvement in delinquency increases the likelihood of reporting victimization. Further research could help untangle why this relationship exists. It may be, as Singer (1981) and Anderson (2001) suggest, a subcultural phenomenon of revenge and respect. It could also be more attributable to arguments made by lifestyle/routine activities theories, suggesting that delinquent lifestyles provide environments conducive to victimizations, outside of delinquent peers. Results from the current study do not support the routine activity/lifestyle theories, but
further research using improved measurements could help support or contradict this finding.

Overall, the results of this research yield important insights for understanding the complex relationship between juvenile delinquency and victimization. The results uncover depression as an important mediating variable for the relationship between victimization and future delinquency, particularly with regards to violent delinquency and substance use, and suggest self control to be significantly associated with both behaviors but not to mediate the relationship. Furthermore, analysis suggests increased average time socializing does not increase likelihood of being victimized, and does not mediate the relationship between delinquency and future victimizations. Finally, the findings suggest that an understanding of the different types of delinquency as separate constructs may enable a deeper understanding of the relationship between juvenile delinquency and victimization. Using a nationally representative sample with extended measures of routine activities and other important concepts, such as network peer delinquency, would build on current research to increase generalization and knowledge concerning this relationship.
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Appendix A: Explanation of Measures

Delinquency Measure
Respondents were asked to respond to the following questions indicating how many times they have engaged in the behavior in the past 6 months:

Violent
Fight at school
Hit/seriously threatened to hit someone
Attacked someone with idea of seriously hurting/killing them
Hurt someone badly enough to need bandages/doctor
Used knife/gun/other object to get something from someone
Committed assault
Used force to get money or things

Property
Taken something <$50, other than from store
Taken something >$50, other than from store
Taken something from store
Taken a vehicle
Broken into building/vehicle
Knowingly stole/held stolen goods
Intentionally damaged/destroyed property
Set fire to someone’s property

Substance Use
Smoked cigarettes
Had an alcoholic drink
Used marijuana
Used other illegal drugs

Other
Sold any drugs
Tried to get something by lying
Taken handgun to school
Participated in gang activities

Victimization Measure
Respondents were asked if they had experienced the following events in the past 12 months (yes or no)

Steal something from you and never give it back
Break or ruin any of your things on purpose
Hit or attack you on purpose WITH an object or weapon (wave two only)
Hit or attack you on purpose WITHOUT an object or weapon (wave two only)
Hit or attack you on purpose (wave four only)
Get scared/feel bad because kids called you names/said mean things/didn’t want you around
Get scared/feel bad because grown-ups called you names/said mean things/didn’t want you around
**Depression Measure**
Respondents were asked how often in the past 6 months they had each feeling or experience

- I felt sad
- I couldn't get going
- I did not feel like eating
- My sleep was restless
- I felt depressed
- I felt fearful
- I felt lonely

**Self Control Measure**
Respondents were asked how much they agree with each statement below:

- I often act fast, without thinking
- I don't give much thought and effort to thinking about the future
- I often do whatever brings me pleasure here and now, even at the cost of some distant goal
- I'm more concerned with what happens to me in the short run than in the long run
- I often try to avoid projects I know will be difficult
- When things get hard, I tend to quit or withdraw
- The things in life that are easiest do bring me the most pleasure
- I dislike really hard tasks that stretch my abilities to the limit
- I like to test myself every now and then by doing something a little risky
- Sometimes I will take a risk just for the fun of it
- I sometimes find it exciting to do things for which I might get in trouble
- Excitement and adventure are more important to me than security
- If I had a choice, I would almost always rather do something physical than something mental
- I almost always feel better when I am on the move than when I am sitting and thinking.
- I like to get out and do things more than I like to read or think about ideas
- I seem to have more energy and a greater need for activity than most kids my age.
- I try to look out for myself first, even if it means making things difficult for others
- I’m not very sensitive to other people when they are having a problem
- If things I do upset people, it’s their problem, not mine
- I will try to get things I want even when I know it’s causing problems
- I lose my temper pretty easily
- Often when I’m angry at people, I feel more like hurting them than talking to them about why I’m angry
- When I’m angry, other people better stay away from me
- When I have a serious argument with someone, it’s usually hard for me to talk calmly about it without getting upset

**Time Spent Socializing Measure**
Respondents were asked how much they agreed with the following statements

- I spend a lot of time with other kids after school
- I spend a lot of time with other kids on weeknights
- I spent a lot of time with other kids on weekends

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21-Mar-2012

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Study: Bi-directional Relationship Between Juvenile Delinquency and Victimization
Approval Date: 21-Mar-2012

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 101(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, Responsibilities of Directors of Research Studies Involving Human Subjects. (This document is also available at http://unh.edu/research/irb-application-resources.) Please read this document carefully before commencing your work involving human subjects.

Upon completion of your study, please complete the enclosed Exempt Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,

Julie F. Simpson
Director

cc: File
    Rebellon, Cesar