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The Pennsylvania State University

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Crime, Law, and Justice Program

THE VICTIM-OFFENDER OVERLAP:

SPECIFYING THE ROLE OF PEER GROUPS

A Thesis in

Crime, Law, and Justice

by

Jennifer N. Shaffer

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

December 2003

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ABSTRACT

Although research consistently indicates that adolescents' peers are an important determinant of their involvement in crime as offenders, there has been little attention to whether adolescents' peers influence adolescent victimization. This omission is problematic both because some adolescents alternate between offending and victimization and because many of the same factors that predict offending also predict victimization, suggesting the peer groups may be an important, but overlooked determinant of victimization. Despite important gains in understanding the overlap between victimization and offending important areas of research are undeveloped. Key questions remaining include (a) What is the causal connection between victimization and offending? For example, do they share a similar etiological process? Are they reciprocally related?; (b) How do peers influence both adolescents' risk for victimization and the relationship between victimization and offending?; and (c) Does social context influence the relationships among victimization, offending, and peer groups?

This dissertation addressed each of the issues using data from the National Longitudinal Study of Adolescent Health. Among the more important advantages of these data is the inclusion of detailed information about adolescents' families, the friendship networks among adolescents and their peers, and adolescents' involvement in crime as both victims and offenders.

The results indicate that 1) the relationship between victimization and offending is

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substantial, robust, and reciprocal and that the victim-offender overlap is likely the result of a similar social process; 2) peer group characteristics influence adolescents' risk of both victimization and offending and moderate the effects of offending on victimization; and 3) school context generally does not significantly affect the victim-offender overlap.

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TABLE OF CONTENTS

List of Figures *viii*

List of Tables *ix*

Acknowledgements *xi*

Chapter 1: The Victim-Offender Overlap, Peer Groups, and Social Context 1

Introduction and Research Questions 1

The Victim-Offender Overlap 7
Prior Research on the Victim-Offender Overlap 11
Summary and Implications 30

Peer Groups and Adolescent Involvement in Crime 35
Defining Peer Groups 36
Peer Groups and Offending 38
Peer Groups and Victimization 51

Social Network Perspective 59

School Context and the Victim-Offender Overlap 66

Summary & Hypotheses 70

Chapter 2: Data and Measures 94

Data 94

In-School Surveys 95

In-Home Interviews 96
Social Networks 98

School Administrators Questionnaire 98

Key Measures and Analytic Plan 99
Dependent Variables 99

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Independent Variables 101
Social Network Measures 101
Routine Activities 106
School Context 108

Data Limitations 109

Analytic Plan 112

Chapter 3: Adolescent Criminal Involvement 115

Sample Selection and Descriptive Statistics 115

Prevalence of Victimization, Offending, and Being Part of the Victim-Offender Overlap 121
Summary 123

Bi-Variate Analyses 123
Summary 128

Group Comparisons 130
Peer Group Characteristics 135
Peers' Criminal Involvement 136
Individual Characteristics 137
Summary 138

Conclusions 139

Chapter 4: Multivariate Relationships between Victimization and Offending 145

Cross-lag Logistic Regression Models 146
Results 149
Victimization 149
Offending 159
Summary 165

Instrumental Variable General Methods of Moments Models 167
Results 170
Victimization 170
Offending 174
Summary 177

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Conclusions 178

Chapter 5: Membership in the Victim-Offender Overlap and School Context 184

Bi-Variate Probit Models 184
Test for a Common Underlying Social Process 186
Common Predictors 189

Hierarchical Linear Models 191

Summary 194

Chapter 6: Conclusions 196

Summary of Major Findings 197

Future Research 202

Policy Implications 203

References 206

Appendix A. Complete List of Studies Concerning the Victim-Offender Overlap 212

Appendix B. Additional Interaction Models 215

Appendix C. Negative Binomial Poisson Models 221

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LIST OF FIGURES

Figure 1. Illustration of Network Centrality 92

Figure 2. Illustration of Network Density 93

Figure 3a. Offender Year 1 by Centrality 156

Figure 3b. Offender Year 1 by Density 157

Figure 4. Offender Year 1 by Peer Group Offending 158

Figure 5. Centrality by Density 159

Figure 6. Centrality by Status Prestige 165

Figure 7. Non-recursive Model of the Relationship between Victimization and Offending 168

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LIST OF TABLES

Table 1. Significant Prior Research on the Victim-Offender Overlap 75

Table 2. Definition and Calculation of Variables Included in Research 83

Table 3a. Descriptive Statistics for Sample Wave 1 117

Table 3b. Descriptive Statistics for Sample Wave 2 119

Table 4. Prevalence of Victimization and Offending 121

Table 5. Distribution of Criminal Involvement in Adolescent Peer Groups 122

Table 6. Relationship Between Offending and Victimization Within Years 124

Table 7. Relationship Between Victimization and Offending Across Years 125

Table 8. Correlation Coefficients between Adolescent Criminal Involvement and Peer Group Characteristics 127

Table 9a. Cross-tab Comparison of Adolescents by Crime Group 133

Table 9b. One-Way ANOVA Comparison of Adolescents by Crime Group 134

Table 10. Number of Significant Differences between Crime Groups 143

Table 11. Base Models: Cross-lag Logistic Regression Models of Victimization Year 2 150

Table 12. Peer Group Interaction Models: Cross-lag Logistic Regression Models of Victimization Year 2 154

Table 13. Base Models: Cross-lag Logistic Regression Models of Offending Year 2 161

Table 14. Peer Group Interaction Models: Cross-lag Logistic

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Regression Models of Offending Year 2 163

Table 15. GMM-IVE Logistic Regression Models of Victimization Year 2 171

Table 16. GMM-IVE Logistic Regression Models of Offending Year 2 175

Table 17. Bi-variate Probit Regression of Victimization and Offending 187

Table 18. HLM Regression of Victimization and Offending 193

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Chapter 1

The Victim-Offender Overlap, Peer Groups, and Social Context

Introduction and Research Questions

Offenders are 1.5 to 7 times more likely than non-offenders to be victims, and victims are 2 to 7 times more likely than non-victims to be offenders (Singer 1981; Lauritsen et al. 1991; Shaffer 2000; Shaffer & Ruback 2002). Together, these findings suggest there is a victim-offender overlap, that is, that victims and offenders are often the same individuals (Wolfgang 1958; Singer 1981; Jensen & Brownfield 1986; Lauritsen et al. 1991; Sampson & Lauritsen 1994).

In addition to documenting the strong, positive relationship between victimization and offending, studies of the victim-offender overlap have produced clear evidence that the relationship between victimization and offending is widely generalizable. Researchers have replicated the positive association between victimization and offending using data from general population samples of adults (e.g., Sampson & Lauritsen 1990) and of juveniles (e.g., Lauritsen et al. 1991) and from specialized samples of adult offenders and deviant youth (e.g., Shaffer 2000; Whitbeck et al. 2001). Furthermore, the victim-offender overlap is not unique to the United States. Studies using data from other countries including Colombia, Great Britain, Iceland, and the Netherlands all report significant positive associations between victimization and offending (e.g., Klevens et al.

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2002; Sampson & Lauritsen 1990; Bjarnason et al. 1999; Wittebrood & Nieuwbeerta 2000).

Although researchers have clearly established the existence of the victim-offender overlap, we know relatively little about the ways in which victimization and offending influence one another. Nevertheless, prior research on the victim-offender overlap does suggest a number of mechanisms that may explain the relationship between victimization and offending. Many of these suggested mechanisms, which I review in the next section, implicate adolescents' peers and social context as important explanatory factors for the relationship between victimization and offending.

Nearly every study of the victim-offender overlap argues that understanding the relationship between victimization and offending requires an understanding of peer impact. However, these assertions are largely untested. Moreover, although research consistently indicates that peers influence adolescent offending, there is little attention to whether peers affect adolescent victimization. Relatedly, although researchers have long recognized the importance of social context for explaining offending (e.g., Durkheim 1938; Shaw & McKay 1942; Sampson & Groves 1989), and more recently have begun to recognize its importance for explaining victimization, (e.g., Rountree et al. 1991; Lauritsen 2001), research on the victim-offender overlap has generally not included measures of social context.

The omission of peer and social context measures in research on the victim-offender overlap is problematic because many of the same factors that predict offending also predict victimization, leaving open the possibility that the relationship between

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victimization and offending is spurious (Fagan et al. 1987). Alternatively, peers and social context may moderate the relationship between victimization and offending. That is, victimization and offending may increase risk for the other, or the risk may be especially high, only under certain conditions (e.g., in areas with high crime rates or when all peers are delinquent). In any event, these critical areas of research are underdeveloped in the victim-offender overlap literature.

The current study extends previous research on the victim-offender overlap by integrating three interrelated areas of criminological research on adolescent victimization and offending. First, this study explicitly tests many of the mechanisms, suggested by previous research, through which offending influences victimization risk and through which victimization influences subsequent offending. Relatedly, this research is concerned with the relative strength of the effects of victimization and offending on one another, as well as with identifying factors that influence whether adolescents will become part of the victim-offender overlap.

Second, the current study extends existing research and theory about the influence of peers on adolescent offending to account for adolescent victimization. The third area of research that this study incorporates concerns the effects of social context (i.e., school) on the relationships among victimization, offending, and peer groups. By incorporating these last two areas of research, the current study responds to calls that adolescents' victimization and offending cannot be fully understood independent of one another or of the larger social context (Singer 1981; Lauritsen et al. 1991; Sampson & Lauritsen 1994; Meier et al. 2001).

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This study addresses these issues using the restricted access full data set from the National Longitudinal Study of Adolescent Health. Among the more important advantages of these data are the inclusion of detailed information about adolescents' personal lives, their families, the schools they attend, their networks of associations with peers, and their involvement in crime as both victims and offenders. More than in previous studies, the current study is able to disentangle the effects of peer group characteristics and social context from the independent relationships between victimization and offending.

Research on the victim-offender overlap has important theoretical and policy implications for the larger field. Many criminological theories make claims about how stratification factors influence the likelihood of criminal involvement as either a victim or an offender. For example, gender is one of the strongest predictors of criminal involvement, and almost all criminological theories make claims (either explicitly or implicitly) about this relationship. However, research examining the victim-offender overlap, has demonstrated that males' greater rate of offending accounts for about half of the effect of sex on personal victimization (Jensen & Brownfield 1986; Sampson & Lauritsen 1990; Lauritsen et al. 1991; Schreck 1999; Zhang et al. 2001). Thus, analyses that do not incorporate measures of both victimization and offending may produce substantively inaccurate estimates of the predictors of crime. Inaccurate estimates make it problematic to judge the absolute and relative importance of various predictors and thus to determine the utility of a given theory for explaining crime.

Relatedly, findings from research on the victim-offender overlap have contributed

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to significant advances in the expansion and application of criminological theory. Although research and theory on offending have, for the most part, developed separately from research and theory on victimization, findings from studies of the victim-offender overlap have increased recognition that a comprehensive understanding of crime requires synthesizing information about both victimization and offending. For example, Osgood and his colleagues pointed to findings from research on the victim-offender overlap to support their expansion of individual-level routine activity theory, a theory most commonly used to explain victimization, to explain offending (Osgood et al. 1996: 636). In a second example, Schreck built on earlier propositions that the same social processes lead to both offending and to victimization (Gottfredson 1984; Singer 1981; Lauritsen et al. 1991) to adapt a theory of offending, the general theory of crime, to understand victimization (Schreck 1999). Finally, a number of researchers have used the logic of social disorganization theory (e.g., Rountree et al. 1991; Miethe & Meier 1994; Lauritsen 2001), traditionally a theory of area crime rates and adolescent offending, to examine the effect of macro-level factors on victimization risk.

This recent trend toward applying theories of victimization to offending, and *vice versa,* has two important implications. First, it suggests a new approach in criminologists' thinking about the etiology of victimization. Criminological studies of victimization have relied almost exclusively on the three-decades-old explanations offered by routine activity/lifestyle theory. The finding from studies of the victim-offender overlap that offenders are at an increased risk for criminal victimization drew attention to the possibility that existing theoretical frameworks for explaining the

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underlying causes of offending might be equally useful for explaining the underlying causes of victimization.

Second, the trend of using theory about offending and theory about victimization to account for one another suggests that there may not be a need for separate theories of victimization and offending. The fact that theories of victimization and theories of offending have developed independently is in part the result of traditional assumptions that the two behaviors were unique problems. However, because results from research on the relationship between victimization and offending indicate similar processes produce both, it might be possible to develop a unified theory of criminal involvement. Generally, the greater the scope of a theory, the greater its utility (Akers 2000; Dubin 1969). Thus, theories that can explain both victimization and offending are preferable to those that cannot.

Identifying the social processes underlying the victim-offender overlap also has important policy implications. Determining what factors increase the likelihood of both victimization and offending may assist policy makers in their decisions about allocating scarce prevention and treatment resources. Because many of the same factors that predict offending also predict victimization, it may be possible to simultaneously reduce adolescents' risk for both. Moreover, the negative life consequences associated with juvenile criminal involvement, including school dropout, psychological distress, and under- or unemployment in adulthood, may be especially likely among adolescents who are both victims and offenders.

In this chapter, I outline the evolution of prior research and theory on the victim-

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offender overlap and discuss its implications for the current study. Additionally, I review (a) prior literature on how peer groups are related to both adolescent offending and victimization and (b) research suggesting ways that school context might influence the relationships among victimization, offending, and peer groups. The remainder of this chapter begins to establish the rationale for the current study's hypotheses.

The Victim-Offender Overlap

Although contemporary criminologists are aware of the similarities between victims and offenders, and the relationship between victimization and offending, it was not until the late 1970's that researchers explicitly recognized the similarities between victims and offenders. Research examining the victim-offender overlap did not begin until the 1980's.

In part, the delay in recognizing similarities between offending and victimization and the slow pace with which researchers have integrated knowledge about the two is the result of the absence of quality data on victimization and, in particular, a lack of data sets that contain information about both victimization and offending. Today, however, there are a number of high quality data sets with information about victimization and a growing number of data sets that include information about both victimization and offending. Consequently, researchers have recently made important gains in understanding the victim-offender overlap. Table 1 presents a brief overview of the most significant studies of the victim-offender overlap and the contributions these studies have made to explaining the relationship between victimization and offending.

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Of particular importance to the development of research on the victim-offender overlap is Hindelang et al.'s (1978) landmark study of personal victimization and lifestyle theory. Using National Crime Survey data from eight American cities and data from various official sources (e.g., Uniform Crime Reports and National Survey of Jail Inmates), Hindelang and his colleagues were among the first to systematically document the socio-demographic similarities of victims and offenders. Both victims and offenders tend to be male, young, persons of color, and residents of urban areas. Moreover, both groups are also disproportionately single, unemployed (or underemployed), not in school, and of lower socio-economic status.

Having empirically confirmed that for personal crimes the characteristics of victims and offenders are nearly identical, Hindelang and his colleagues proposed the principle of homogeny to explain these similarities: "an individual's chances of personal victimization are dependent upon the extent to which the individual shares demographic characteristics with offenders" (Hindelang et al. 1978: 257). This principle reflects the fact that stratification processes pattern individuals' lifestyles and routine activities[1] through role expectations and structural constraints. That is, role expectations and structural constraints operate in tandem to cause similarly situated individuals to behave in ways that produce a shared lifestyle.

Role expectations, which result from cultural prescriptions about the appropriate behavior for individuals based on their ascribed or achieved characteristics (Hindelang et

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1 The terms lifestyle and routine activities refer to the common ways individuals use their time (e.g., employment, school, leisure activities) and allocate interest and participation across their social roles (e.g., spouse, employee, student, and friend) (Hindelang et al. 1978; Cohen & Felson 1979).

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al. 1978; Grusky 2001; Meier et al. 2001), identify the lifestyle and behavioral choices individuals can make and still function smoothly in society. More specifically, societal role expectations make different demands on the behavior of different groups (e.g., children versus adults, men versus women, and members of higher versus lower socio-economic strata).

Structural constraints, such as rates of employment and familial arrangements, also differentially direct individuals' choices about appropriate behaviors (Hindelang et al. 1978; Meier et al. 2001). For example, parenthood and marriage direct time toward home responsibilities (e.g., employment and child supervision) and influence the nature of leisure time activities (e.g., socializing with other parents or spending more time at home). However, being childless and being single direct time away from the household (e.g., because there are fewer household maintenance responsibilities) and differentially influence the nature of leisure time activity (e.g., socializing with other singles, visiting bars).

The implication of the principle of homogeny is that because victims and offenders share many socio-demographic characteristics, the same role expectations and structural constraints that increase risk for victimization similarly increase risk of offending. That is, socio-demographic factors structure individuals' lifestyle, and lifestyle, in turn, influence individuals' risk for criminal involvement as both victims and offenders.

At the same time that Hindelang et al. (1978) were developing their theory of lifestyle, another group of researchers were developing a similar theory that focused on

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why lifestyle and routine activities influence crime rates (Cohen & Felson 1979). Routine activity theory is an extension of lifestyle-exposure theory, in that it specifies what characteristics of individuals' routines increase their risk for criminal victimization. Because these two theories are not substantively different (both focus on how typical, daily routines affect individuals' exposure and proximity to offenders and their victimization risk), researchers often collapse them into a single opportunity perspective (Miethe et al. 1987; Meier & Miethe 1993; Osgood et al. 1996).

The essence of Cohen and Felson's routine activity theory is that victimization risk is a function of individuals' exposure and proximity to offenders, and that individuals' lifestyles-routine activities differentially expose them to potential offenders. More specifically, the authors argued that crime arises during the course of other, legal routines (1979: 590). Because crime can only occur when an offender and a suitable target come together in the absence of capable guardianship, individuals' routine activities are a significant contributor to their risk for victimization (Cohen & Felson 1979; Gottfredson 1986; Meier & Miethe 1993; Meier et al. 2001). Daily activities that reduce individuals' level of guardianship (e.g., by taking them away from home), increase their exposure or proximity to potential offenders (e.g., residence in high crime areas), or increase their target suitability (e.g., carrying expensive goods or being alone) increase risk of both property and personal victimization.

Routine activity and lifestyle-exposure theories represented the first significant theoretical development in victimization research since criminologists abandoned the theory of victim precipitation in the late 1960's and early 1970's (Meier & Miethe 1993).

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Moreover, because this theoretical perspective highlighted the potential connections between victimization and offending, they also led to the first explicit examinations of the victim-offender overlap.

Prior Research on the Victim-Offender Overlap

The first studies of the victim-offender overlap acknowledged the importance of routine activities for bringing together motivated offenders and suitable targets in the absence of capable guardianship. However, rather than focusing on shared lifestyle, these studies focused on the role of shared cultural adaptation to structural constraints and role expectations in producing the victim-offender overlap (Singer 1981; Singer 1986). That is, the first studies explained the victim-offender overlap by focusing on the internal motivations of individuals involved in lifestyles associated with increased risk for victimization. This perspective, most closely related to subculture of violence and delinquency theories (Wolfgang & Ferracuti 1967; Cohen 1955), contends that subgroups of the population adapt to the pressures of structural constraints and role expectations by adopting values that are often in opposition to those held in the dominant culture, including values that support the use of violence.

Accordingly, subculture of violence theory suggests that offenders and victims are often the same individuals because they are members of subgroups that encourage retaliation against perceived wrongs (Wolfgang & Ferracuti 1967; Singer 1981; Sampson & Lauritsen 1994). For example, an accidental jostle might provoke a verbal assault, which may further escalate into violence as each member responds to the other with

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increasing force. In situations that involve a criminal victimization, subcultural norms may demand increasingly violent responses. More specifically, victims and potential victims who hold values favorable to the use of violence are likely to respond to their offenders with force, and consequently become an offender in the incident (Singer 1981; Luckenbill & Doyle 1989; Kennedy & Baron 1993; Markowitz & Felson 1998).

In the first explicit examinations of the victim-offender overlap, Singer (1981, 1986) used data from the follow-up study of Wolfgang's Philadelphia birth cohort and interpreted his findings from a subculture of violence perspective. Singer reported that victims in the study were between 1.7 and 2.8 times more likely than non-victims to commit a subsequent offense. This relationship was especially strong among gang members. The odds of offending among victimized gang members was 17.00 compared to 1.17 for victims who were not gang members (Singer 1981). Singer also reported that three indicators of subculture membership (the severity of offenders' juvenile arrest record, their gang membership, and their victimization) accounted for 32% of the variation in the seriousness of their adult arrest records (Singer 1986).

These two studies indicated that victims were at substantially higher risk than non-victims for offending along a number of different dimensions (e.g., racial and ethnic minority group membership and gang membership). Singer argued that this pattern of findings was the result of subcultural adaptations to the dangers of lower-class urban life and suggested three factors that might produce the relationship between victimization and offending. First, members of subcultures with normative standards that support the use of violence are likely to associate with others who also hold values favorable to the use of

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violence. Thus, interaction with delinquent peers heightens the risk of violence.

Second, in areas and among groups where legitimate forms of social control are absent or difficult to access, victims use violence to sanction offenders. This argument is consistent with the notion of crime as a method of informal social control (Black 1983) and with the argument that offenders are likely to become victims because they can be targeted with little legal risk (Sparks 1982). More specifically, victims who have access to relatively few legal means of redress (e.g., those from the lower-class) are likely to punish their offender and restore their sense of justice by using violence themselves. Moreover, this behavior is especially likely among offenders who may be less willing to report crimes to the police because of their own current or prior illegal behavior (Jacobs et al. 2000).

Finally, Singer argued that criminal victimization might be the impetus for some to adopt subcultural norms favorable to the use of violence. Victims may legitimate the use of violence in response to perceived wrongs by reasoning that "everyone else is doing it" (Sykes & Matza 1957). Thus, victimization experiences may normalize offending and result in subcultural adaptations that favor the use of violence.

Together, these three factors led Singer to hypothesize a reciprocal relationship between victimization and offending. That is, Singer claimed that victimization and offending simultaneously increase the likelihood of the other because both involve (a) the presence of peers, (b) the absence of social controls, and (c) a social learning process in which experiencing one teaches about the other.

Singer (1986:62) concluded that alternating between victimization and offending

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is "exactly the type of experience that generates and maintains the values, attitudes, and conduct norms" that characterize subcultures of violence. Unfortunately, Singer simply assumed the existence of violent subcultural norms from the presence of a strong relationship between violent victimization and violent offending. Only one subsequent study of the victim-offender overlap has included measures of respondents' attitudes toward the law and toward conventional values, and this study produced only weak support for the hypothesis that the adoption of subcultural values influences the relationship between victimization and offending.

Using data from a sample of inner-city high school students, Fagan et al. (1987) examined the effects of conventional attitudes and values toward the law on the relationship between victimization and offending. The results of the study include the surprising finding that adolescents with more favorable attitudes toward the law are at somewhat higher risk for victimization than adolescents with less favorable attitudes toward the law (Fagan et al. 1987: 602). Although this finding is somewhat suspect (in that the models predicting victimization did not control for prior involvement in crime as an offender), the positive association between attitudes favorable to the law and victimization is evidence against Singer's contention that "mainstream" values decrease the likelihood of membership in the victim-offender overlap. Moreover, in their models predicting offending, Fagan et al. (1987) reported that including measures of conventional attitudes and values toward the law did not substantively reduce the effects of victimization on offending.

Consequently, subsequent research on the victim-offender overlap largely

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abandoned subcultural explanations in favor of the situational explanations of lifestyle and routine activity theory. Gottfredson's (1984) explanation of the relationship between victimization and offending helped to ensure the dominance of this theoretical perspective in the victim-offender overlap literature. Using data from the British Crime Survey, Gottfredson found that offenders were between 2 and 7 times more likely to be victims than non-offenders and that the same lifestyles (i.e., drinking and weekend nights out) and demographic characteristics associated with victimization were also associated with offending (Gottfredson 1984). Gottfredson rejected the idea that the relationship between victimization and offending was the result of a reciprocal, sub-cultural process and argued instead that:

> "…there is a lifestyle that for some includes high probabilities of misfortunes, victimization and offending, due perhaps to where they live, where they go, and with whom they associate: in other words, the social processes which produce high rates of offending in some segments of the population are also productive to high rates of victimization." (Gottfredson 1984: 17).

Although Gottfredson did not develop the theoretical rationale for the claim that these three factors (routine activities, area of residence, and peers) produce the victim-offender overlap, subsequent research has devoted a great deal of attention to this task.

The first major theoretical development in research on the victim-offender overlap came from Jensen and Brownfield's study of the effects of offending on juveniles' risk for victimization (1986). The authors conceptualized offending as a *type* of routine activity- rather than as a product of routine activities- that increased individuals' risk for criminal victimization because of the "motives, vulnerability, or culpability" of those

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involved (Jensen & Brownfield 1986:87). This conceptualization of offending as a type of routine activity, or, combined with alcohol and substance use, as a type of delinquent lifestyle, has influenced nearly every subsequent study of the victim-offender overlap.

Using self-report data from two samples of high school students, Jensen and Brownfield (1986) examined the associations among nine typical indicators of lifestyle (e.g., evenings out for fun, shopping, visiting friends), seven indicators of offending (e.g., theft, assault, threatening someone with a weapon), and seven indicators of victimization (e.g., theft, assault, robbery). The authors reported that after controlling for offending, none of the typical indicators of lifestyle significantly predicted victimization risk. Moreover, the results indicated that the greater juveniles' involvement in delinquent activities, the greater their rates of victimization.

Because none of the traditional measures of routine activities significantly predicted victimization after controlling for offending, Jensen and Brownfield argued that the propositions of routine activity theory, which set out the necessary conditions of crime and identify the role of socio-demographic factors for explaining victimization risk, are unnecessarily complicated. The authors concluded, "*those most likely to be the victims of crime are those who have been most involved in crime; and the similarity in characteristics of victims and offenders reflects that association*" (1986: 97, original emphasis). The authors also suggested that association with delinquent peers increases adolescents' risk of criminal victimization both because it increases exposure to potential offenders and because it increases exposures to situations that carry a high risk for

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victimization by increasing the likelihood of offending (1986).

Based on the pattern of their results, Jensen and Brownfield contended that researchers should abandon opportunity models of the victim-offender overlap in favor of theories that focused on the internal motivations of victims and offenders. The authors argued that offenders were at increased risk of victimization not because victims vary in their attractiveness as targets or because their lifestyles routinely expose them to offender populations, but because the same absence of social controls that increases the likelihood of offending also increases the likelihood of victimization.

Ultimately, the study implies that low self-control and low social control produce the victim-offender overlap. The concept of self-control refers to the extent to which people are able to internally regulate their behavior, and the concept of social control refers to the extent to which people are subject to external regulations of their behavior (e.g., social bonds with others) (Hirschi 1969; Gottfredson & Hirschi 1990; Tedeschi & Felson 1994). The authors argue that individuals who seek out fun, excitement, and thrills (activities that are strongly appealing to individuals with low self-control) often find themselves in situations where they are just as likely to become victims as to commit an offense (Jensen & Brownfield 1986). Likewise, individuals whose behavior is relatively unconstrained by external social controls are at equal risk for becoming involved in crime as victims and as offenders.

Despite the study's theoretical emphasis on the role of internal motivations and external social controls for explaining the victim-offender overlap, Jensen and Brownfield did not empirically test these claims. Moreover, subsequent research has

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provided only partial support for the argument that low self-control is important for explaining the relationship between victimization and offending. Schreck examined the utility of low self-control for explaining the victim-offender overlap using data from the Tucson Youth Project (Schreck 1999). The results of this study indicate that both low self-control and offending significantly, and independently, increase individuals' risk for victimization, although offending mediates about one-third of the effect of low self-control on offending. Whereas this study successfully extended the general theory of crime to explain victimization, the results did not support Jensen and Brownfield's contention that the relationship between victimization and offending is the spurious result of low self-control.

Research has also not supported Jensen and Brownfield's (1986) contention that external social controls are important for explaining the relationship between victimization and offending. Using self-report data from a sample of inner-city high school students, Fagan and his colleagues reported that strong social bonds (an indicator of external social control) did not significantly influence adolescents' risk for victimization (Fagan et al. 1987) once other important factors were controlled.

In sum, Jensen and Brownfield's claim that external social controls and individuals' internal motivations are more important for understanding the victim-offender overlap than the situational and opportunity factors suggested by routine activity theory has received little support from research on the victim-offender overlap. Generally, subsequent studies of the victim-offender overlap have not picked up this thread of Jensen and Brownfield's theoretical logic.

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As noted above, subsequent studies of the victim-offender overlap have examined the logic of offending as a type of routine activity for explaining the relationship between victimization and offending. Using data from the Denver Youth Study, Esbensen and Huizinga reported that offenders were at substantially higher risk for victimization than were non-victims and that the greater the number of types of crimes adolescents were involved in (e.g., assault, drug use, robbery), the greater their risk for victimization (Esbensen & Huizinga 1987). The authors concluded that this pattern of results suggests offending is a type of routine activity which carries an enhanced risk for criminal victimization, particularly violent victimization.

Using data from the British Crime Survey, Sampson and Lauritsen (1990) refined the thesis of offending as a type of routine activity by distinguishing general deviant behavior from criminal, especially violent, offending. Specifically, the authors maintained that violent offending contributes to victimization risk, independent of deviant lifestyles ("e.g., extensive drinking, drug use, or partying" 1990: 112), for two reasons. First, offenders are likely to associate with other offenders, which increases their exposure to others who are likely to victimize them. Second, because of their own illegal behavior and presumed decreased credibility with law enforcement, offenders can be victimized with relative impunity (1990: 112).

This study also extended research on the victim-offender overlap by examining the effects of the victim-offender relationship (e.g., strangers or acquaintances) and community factors on the relationship between victimization and offending. To address the question of whether the victim-offender overlap is specific to groups of acquaintances

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who prey upon one another (i.e., that offenders are victimized by their peers who are also offenders), Sampson and Lauritsen examined separate models predicting stranger- and acquaintance-victimization.

Building on earlier work, the study also examined the role of area violent crime rates for explaining the relationship between victimization and offending. Prior research had suggested two ways that area crime rates might influence the victim-offender overlap. First, Fagan and his colleagues argued that the observed relationship between victimization and offending might be the spurious result of the areas where victims and offenders live (Fagan et al. 1987). Second, previous studies had also suggested that both particular kinds of communities and individuals' own offending increase their risk of victimization (Hindelang et al. 1978; Gottfredson 1984; Jensen & Brownfield 1986; Garofalo et al. 1987; Sampson & Lauritsen 1990). That is, offending mediates part of the effect of community factors on victimization risk, but both offending and community factors continue to have significant, direct effects on victimization risk.

Consistent with prior research on the victim-offender overlap, the results of this study indicated that both minor and serious offending significantly increased individuals' victimization risk (Sampson & Lauritsen 1990). Moreover, the effects of offending on victimization were not substantively different across the models predicting stranger- and acquaintance-victimization. Although the results of this study suggested that the relationship between offending and victimization is not restricted to acquaintance groups, it also contradicted earlier claims that victims and offenders likely belong to separate social networks (Fagan et al. 1987). This study also provided evidence against the

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argument that the relationship between victimization and offending is the spurious result of the areas where victims and offenders live. That is, offending continued to have strong effects on victimization risk, even after controlling for the community level factor of area crime rates.

Importantly, the authors reported that participation in deviant lifestyles (operationalized as alcohol and drug use) did not significantly influence individuals' risk for victimization after controlling for their offending behavior. Although the authors interpreted their findings in terms of offending as a type of routine activity, their results indicate that offending is empirically distinct from the more general construct of "deviant or delinquent" lifestyle.

The results from this study highlighted three areas of research on the victim-offender overlap. First, although they were not able to test this claim, the authors argued that association with peers was important for understanding the relationship between victimization and offending (Sampson & Lauritsen 1990: 111-112). Second, and related, the results were also supportive of the principle of homogeny. That is, although their effects were attenuated, sociodemographic factors (e.g., age and gender) continued to influence individuals' risk for victimization, even after controlling for their level of offending. Finally, the finding that area crime rates significantly influenced victimization risk indicates that risk of victimization increased as proximity and exposure to offenders increases (1990: 132). Because community-level factors significantly influence the likelihood of victimization, the results of this study suggest that in order to disentangle the independent effects of victimization and offending on one another analyses of the

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victim-offender overlap should consider both micro- and macro-level variables.

Lauritsen, Sampson, and Laub revisited the topic of the victim-offender overlap and these three research areas using data from the first five waves of the National Youth Survey (Lauritsen et al. 1991). Moreover, the authors again refined the thesis of offending as a type of routine activity. The authors argued that delinquent lifestyles comprise three factors. The first, offense activity, incorporates Jensen and Brownfield's contention that "offending is a type of routine activity because of the motives, vulnerability, or culpability of the people involved in those activities" (Jensen & Brownfield 1986: 87). More concretely, Lauritsen et al. (1991) claimed that offending is a routine activity that increases risk for victimization because it increases proximity to motivated offenders (e.g., most offending occurs in groups) and increases target suitability (e.g., offenders can be targeted with relative impunity).

The second component of delinquent lifestyles, association with delinquent peers, incorporates the principle of homogeny. Because people tend to associate with similar others, victimization risk increases directly with the number of characteristics shared with offenders. For example, a young inner-city male is at greater risk of victimization than an older female living in a stable community because, compared to the latter, the former shares more characteristics with and is more accessible to offenders. A complementary interpretation of the role of delinquent peers is that association with delinquent peers is part of a social learning process in which adolescents learn about offending by first experiencing crime as a victim (Fagan et al. 1987).

The final component of delinquent lifestyles, activities that involve the

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"recreational and active pursuit of fun" (Jensen & Brownfield 1986: 92), incorporates the routine activity concept of guardianship. For example, drinking and drug use often occur within risky contexts (e.g. parties, bars) and lower individuals' ability to act as their own guardians (Lauritsen et al. 1991: 268). Unfortunately, data limitations prevented the inclusion of the third component, recreational pursuit of fun, in the study's final measure of delinquent lifestyles. Accordingly, the final measure combined participants' delinquency with the delinquency of participants' peers. In addition to examining how neighborhood disorder and association with delinquent peers influence the victim-offender overlap, factors their previous work suggested were important (Sampson & Lauritsen 1990), Lauritsen et al. (1991) extended research in this area by explicitly testing whether the relationship between victimization and offending is reciprocal (Singer 1986).

Consistent with prior research, the results indicated that delinquents were nearly four times more likely than non-delinquents to experience assault victimization and more than twice as likely to experience robbery and vandalism victimization. The authors also reported that involvement in delinquent lifestyles had a stronger effect on the likelihood of victimization than did any of the other variables entered into their models. Moreover, delinquent lifestyles significantly mediated the effects of traditional sociodemographic risk factors.

Inconsistent with prior studies, neighborhood disorder was not a strong or consistent predictor of adolescent victimization. Although the results of this study provide further evidence that the victim-offender overlap is not the spurious result of

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where victims and offenders live, they cast doubt on earlier claims that exposure and proximity to offenders increases victimization risk independent of individuals' own offending (Hindelang et al. 1978; Jensen & Brownfield 1986; Garofalo et al. 1987; Sampson & Lauritsen 1990). Specifically, offending significantly influenced adolescents' victimization risk, even after controlling for neighborhood disorder (the study's measure of exposure and proximity to offender populations), which did not significantly influence victimization risk.

Noting that their measure of neighborhood disorder did not capture changes across waves (e.g., participants moved between waves or neighborhood characteristics changed dramatically), Lauritsen et al. (1990) cautioned that this finding should be interpreted cautiously. Nevertheless, a similar study of the victim-offender overlap among Icelandic adolescents also found that neighborhood factors did not significantly influence victimization risk (Bjarnason et al. 1999). Consequently, the role of community factors in producing the victim-offender overlap remains unclear.

Of particular note, this was the first study to examine whether there is a simultaneous, or reciprocal, relationship between victimization and offending (Lauritsen et al. 1991). The authors hypothesized that, in addition to offending increasing victimization risk, victimization might also increase risk for offending. If so, then the finding of a direct effect of delinquency on adolescents' victimization risk might actually represent a reciprocal effect of victimization on delinquency. The results of these analyses did not differ substantively from the results of models that did not control for possible reciprocal effects between victimization and offending (Lauritsen et al. 1991).

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That is, involvement in delinquent lifestyles continued to be the largest significant predictor of adolescents' victimization risk, even after controlling for a possible reciprocal effect of victimization on delinquent lifestyles.

The authors also reported a significant reciprocal relationship between victimization and offending: "…not only did delinquent lifestyle significantly explain changes in victimization, but increases in victimization were significantly linked to increased involvement in delinquent lifestyles." (Lauritsen et al. 1991: 286). This finding provides direct support for Singer's (Singer 1981; Singer 1986) contention that there is a population of individuals who alternate between offending and victimization, and it is among the strongest published evidence of the victim-offender overlap to date. In spite of this notable finding, the authors downplayed the effect of victimization on adolescents' risk of offending, focusing instead on the finding that delinquent lifestyles continued to increase adolescents' risk for victimization even after controlling for the reciprocal effect of victimization on delinquent lifestyles.

Together, the results of this analysis and the inclusion of peers' delinquency in the study's measure of delinquent lifestyles (Lauritsen et al. 1991) have two important implications for future research on the victim-offender overlap. First, the meaning of the finding that victimization has a reciprocal effect on delinquent lifestyles is not clear. There are several possibilities. For example, it may be that victimization directly increases the likelihood of adolescents' offending and has little or no effect on their peers' delinquency. A second possibility is that victimization directly increases the likelihood of peers' delinquency (e.g., victimized adolescents seek out "tough,

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delinquent" peers as a means of protection or peers' delinquency increases because they criminally retaliate against the offender), but only indirectly increases adolescents' own offending through their association with delinquent peers (Sutherland & Cressey 1955). In any event, a manifest goal of subsequent research on the victim-offender overlap is to disentangle the theoretical implications of a reciprocal effect of victimization on offending.

Second, the study's results suggest that there may be an important, but overlooked, relationship between victimization and association with peers. Although criminologists have long recognized the substantive importance of peers for explaining adolescents' own delinquency, only a very few have explicitly examined whether peers are also important for explaining adolescents' victimization (Fagan et al. 1987; Schreck 1999). The possibility that victimization influences peer delinquency, or that peer delinquency increases adolescents' victimization risk, has significant implications for research and theory on the victim-offender overlap, and for victimization research more generally.

Subsequent studies of the victim-offender overlap have produced mixed evidence regarding the nature of the relationship between victimization and offending. Data from a sample of males ages 16 through 19 indicate that although victimization has a simultaneous effect on deviant lifestyle (i.e., drinking, drug use, and a composite indicator of delinquency based on 34 items reflecting property and personal and minor and serious crimes), victimization does not predict subsequent involvement in deviant lifestyles (Zhang et al. 2001). Specifically, victimization at time 1 increased the risk of

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involvement in a deviant lifestyle at time 1, but not the risk of involvement in a deviant lifestyle at time 2. Regarding the effects of deviant lifestyle on victimization, the results indicated that the relationship is both simultaneous and lagged (Zhang et al. 2001). That is, involvement in a deviant lifestyle at time 1 increased the likelihood of victimization at both time 1 and time 2.

However, the results of this study should be interpreted cautiously because of the limited generalizability of the sample. The data for this study came from the Buffalo Longitudinal Survey of Young Men, which included only young, male, and urban "high risk" adolescents (Zhang et al. 2001). One example illustrating that Zhang et al.'s (Zhang et al. 2001) findings are not generalizable beyond their study sample concerns research on repeat- and multiple-victimization. Although Zhang et al. (Zhang et al. 2001) reported that victimization at time 1 was not a significant predictor of victimization at time 2, most victimization research indicates that just as prior offending is the best predictor of subsequent offending, prior victimization is the best predictor of subsequent victimization (Lauritsen & Quinet 1995; Menard 2000; Outlaw et al. 2002). The fact that Zhang et al.'s (2001) report of no effect of prior victimization on subsequent victimization is at odds with most other research on repeat victimization belies the study's finding that prior victimization does not influence subsequent involvement in deviant lifestyles.

Consistent with the results of two studies described above, a third study has reported that offending has both simultaneous and lagged effects on victimization and that victimization has a simultaneous effect on offending (Shaffer 2000). Using data from a sample of predominantly rural probation clients, Shaffer (2000) also found that

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prior victimization and offending significantly increased the likelihood of subsequent victimization. Although the study's finding about the effects of prior victimization on subsequent victimization and offending contradict Zhang et al.'s (2001), it provides only modest support for the position that prior victimization increases the likelihood of subsequent offending (Singer 1986; Lauritsen et al. 1992; Lauritsen et al. 1991), because this study also relies on a sample with limited generalizability. Also unfortunate, the Shaffer study did not include a measure of peers' delinquency and thus could not address the role of this factor for understanding the victim-offender overlap.

Research subsequent to Lauritsen et al's (1991) study has made only modest gains toward understanding the relationship between victimization and offending. These studies have generally contributed to knowledge about the victim-offender overlap in three ways. First, there is now substantial empirical evidence that similar social processes produce both victimization and offending. For example, a number of studies report evidence supporting the claims of routine activity perspective that similar lifestyles and patterns of time use influence both victimization and offending (Lauritsen et al. 1992; Osgood et al. 1996; Zhang et al. 2001). In fact, the results of recent research on the victim-offender overlap suggesting that similar social processes produce both victimization and offending are beginning to influence research in other areas of criminology (McCarthy et al. 2002).

Second, although early studies of the victim-offender overlap generally relied on cross-sectional analyses of the relationship between victimization and offending, more recent studies, using longitudinal data, have been able to establish the temporal ordering

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of the sample's victimization and offending (Lattimore et al. 1997; Schreck 1999; Zhang et al. 2001; Shaffer & Ruback 2002). This is important because, although most studies have not tested whether the relationship between victimization and offending is reciprocal, overall, the findings suggest that the observed effects of offending on victimization do not actually reflect a reciprocal effect of victimization on offending, and *vice versa* (Lauritsen et al. 1992; Zhang et al. 2001; Shaffer & Ruback 2002).

The vast majority of research on the victim-offender overlap has examined only the effects of offending on victimization, ignoring or glossing over the possibility that victimization also influences offending. However, recent research has given greater attention to the effects of victimization on offending. Data from the National Youth Survey indicate that criminal victimization[2] has both short- (within adolescence) and long-term (between adolescence and adulthood) effects on offending (Menard 2002). Furthermore, data from the National Longitudinal Study of Adolescent Health indicate the short-term effects of victimization on offending are stronger than its long-term effects, although both relationships are substantial (Shaffer & Ruback 2002). Shaffer and Ruback reported that, compared to non-victims, victimized adolescents were between 2.4 and 4.1 times more likely to report having committed a violent offense during the same year and 3.1 times more likely to report having committed a violent offense during the next year (Shaffer & Ruback 2002:3,4).

Finally, recent research has also contributed to knowledge about the victim-offender overlap by extending its generalizability. For example, studies have confirmed

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[2] Menard's (2002) measure of childhood victimization (i.e., victimization between the ages of 11 and 17) excluded instances of child abuse.

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that the relationship between victimization and offending holds for both relatively minor crimes (e.g., being loud and rowdy, dodging public transportation fares, panhandling) and for very serious crimes, including homicide victimization (Lattimore et al. 1997; Dobrin 2001). Studies of the victim-offender overlap have also confirmed that the relationship between victimization and offending is substantial whether relying on self-report data (as most studies have) or on data from official sources (e.g., data collected by police or courts) (Lattimore et al. 1997).

Summary and Implications

In review, prior research provides clear evidence of the victim-offender overlap. The incidence and prevalence of victimization and offending substantially increase the incidence and prevalence of the other, even after controlling for other important factors related to criminal involvement (Lauritsen et al. 1991; Zhang et al. 2001; Shaffer & Ruback 2002). Studies examining how offending influences victimization risk routinely report that offending, together with alcohol and drug use, has a stronger effect on victimization than any other variable included in the analyses (Jensen & Brownfield 1986; Lauritsen et al. 1991; Schreck 1999). Moreover, offending typically accounts for up to one-half of the effect of socio-demographic variables (e.g., race/ethnicity and sex) on individuals' risk for victimization (Singer 1986; Jensen & Brownfield 1986; Lauritsen et al. 1991; Sampson & Lauritsen 1994; Schreck 1999).

Although most studies of the victim-offender overlap have focused on how

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offending influences victimization, researchers are paying greater attention to how victimization influences the likelihood of offending. In general, the results of these studies indicate that the effects of victimization on offending are as robust as the effects of offending on victimization (Singer 1986; Shaffer 2000). Three studies have found that offending and victimization have reciprocal effects on one another (Lauritsen et al. 1991; Shaffer 2000; Zhang et al. 2001). Furthermore, the results of two of these studies indicate that prior victimization increases the risk of subsequent offending, even after controlling for reciprocal effects between prior victimization and prior offending (Lauritsen et al. 1991; Shaffer 2000).

Collectively, studies of the victim-offender overlap have highlighted the importance of extending three areas of research: (a) the claim that offending and victimization are the result of similar processes, particularly the routine activities of victims and offenders; (b) the influence of peers on the victim-offender overlap specifically, and victimization risk more generally; and (c) how community factors influence the relationships among victimization, offending, and peers.

First, although most studies conclude that the victim-offender overlap reflects the fact that similar social processes produce both victimization and offending, the evidence supporting this position is mostly circumstantial. For example, researchers support this claim by noting that the same theoretical explanations that explain offending also explain victimization (Singer 1981; Gottfredson 1984; Jensen & Brownfield 1986; Esbensen & Huizinga 1987) and that many of the same variables are significant predictors of both

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victimization and offending (Gottfredson 1984; Huizinga & Jakob-Chien 1998; Loeber et al. 2001; Shaffer & Ruback 2002). Relatedly, prior research on the relationship between victimization and offending has not examined how individuals who are part of the victim-offender overlap (i.e., are both victims and offenders) differ from those who are victims only, from those who are offenders only, and from adolescents who are not involved in crime as either victims or offenders. The current study explicitly examines these issues using the methods described in the following chapters.

As can be seen in table 1, most criminologists appear to believe that the victim-offender overlap is the result of an underlying social process involving individuals' routine activities. The most common explanation of the relationship between victimization and offending, and the most pervasive idea in the victim-offender overlap literature, is Jensen and Brownfield's (1986) contention that offending is a type of routine activity. Criminologists generally agree that offending as a routine activity increases victimization risk because it increases individuals' target attractiveness (e.g., they can be targeted with relative impunity), lowers guardianship (e.g., many illegal acts are committed in private), and increases exposure to potential offenders (e.g., most offenses occur in groups). Although the operationalization of offending as a routine activity has varied somewhat across studies (Jensen & Brownfield 1986; Sampson & Lauritsen 1990; Lauritsen et al. 1991; Zhang et al. 2001), it typically comprises adolescents' criminal offending and factors that reflect the "recreational pursuit of fun," such as alcohol and drug use. Nevertheless, the idea of offending as a *type* of routine activity is incompatible

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with routine activity theory's propositions, which would suggest that offending is an *outcome* of individuals' routine activities (Cohen & Felson 1979; Osgood et al. 1996; Akers 2000).

The second important area of research to develop concerns the role of peers in explaining the relationship between victimization and offending. Although only a very few studies have examined the effects of peers' delinquency on adolescents' risk for criminal victimization (Fagan et al. 1987; Lauritsen et al. 1991; Schreck et al. 2003), most criminologists theorize that peer groups play a central role in producing the victim-offender overlap (Singer 1986; Esbensen & Huizinga 1987; Sampson & Lauritsen 1990; Lauritsen et al. 1991; Shaffer & Ruback 2002).

Specifically, prior research suggests that peers influence the victim-offender overlap in three ways. First, because offenders are likely to associate with other offenders, adolescents' victimizers are often members of their own peer group (Singer 1981; Sampson & Lauritsen 1994). Second, some researchers have argued that association with delinquent peers is part of a social learning process in which adolescents learn about offending by first experiencing it as a victim (Fagan et al. 1987). Finally, Lauritsen et al.'s (1991) measure of delinquent lifestyles, which comprises adolescents' own offending and that of their peers', suggests a third way in which peers might influence the victim-offender overlap. The finding that victimization significantly increased involvement in delinquent lifestyles (1991: 286) provides empirical evidence that victimization might also influence peers' delinquency or that peers' delinquency

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increases adolescents' risk of victimization.

Unfortunately, because the authors' measure of delinquent lifestyles is a composite, it remains unclear whether victimization primarily influences adolescents' own offending, their peers' offending, or both. This dissertation, guided by the hypotheses summarized at the end of this chapter, explicitly examines how peers influence the victim-offender overlap.

Finally, prior research on the victim-offender overlap has produced mixed evidence regarding how community factors influence the relationship between victimization and offending. Whereas some argue that community factors spuriously account for the relationship between victimization (Fagan et al. 1987), others argue that community factors moderate the relationship between victimization and offending (Singer 1981), and still others that offending mediates part of the effect of community factors on victimization (Sampson & Lauritsen 1990). The results of research on the victim-offender overlap have produced conclusive evidence that the relationship between victimization and offending is not the spurious result of the areas where people live. However, the results concerning the nature of the relationships among victimization, offending, and community factors is mixed. Some studies suggest that offending perfectly mediates the effects of community factors on victimization (Lauritsen et al. 1991; Bjarnason et al. 1999), and the results from others indicate that offending mediates only part of the effect of community factors, and that both offending and community factors have direct effects on the likelihood of victimization (Sampson & Lauritsen 1990;

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Zhang et al. 2001). This dissertation, using the methods described in chapter 2, explicitly examines how community factors (i.e., school) influence the victim-offender overlap.

Peer Groups and Adolescent Involvement in Crime as Offenders and Victims

Most research on the victim-offender overlap suggests that peers have an important influence on the relationship between victimization and offending. This link is not surprising, given that one of the most robust findings in the criminological literature is that individuals with delinquent peers are likely to be delinquent themselves (Matsueda & Anderson 1998; Warr 2002). Exposure to delinquent peers increases during adolescence, and this increased exposure to delinquent peers corresponds to sharp increases in adolescents' own delinquent behavior (Elliott & Menard 1991; Warr 1993).

Although the relationship between offending and associating with delinquent peers is firmly established, there has been intense debate over the causal direction of the relationship between the two. This debate centers on whether people become delinquent because they associate with delinquent peers (a socialization process) or whether people seek out delinquent peers because they are delinquent themselves (a selection process) (Matsueda & Anderson 1998). If peer influence is simply the result of selection processes in which adolescents seek out friendships with those who are behaviorally similar to them, then peers' behaviors probably have only a minimal influence on the victim-offender overlap.

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Research examining selection and socialization effects suggests, however, that both processes operate. That is, the relationship between peer attributes and respondents' own attributes is reciprocal (Matsueda & Anderson 1998; Warr 2002). Delinquent adolescents are more likely than non-delinquent adolescents to form friendships with other delinquents; however, once the friendship is formed, peer delinquency increases adolescents' own offending, independent of their propensity for delinquency (Kandel 1978; Cairns & Cairns 1994; Matsueda & Anderson 1998). Moreover, there is increasing evidence suggesting that selection and socialization each account for about half of the effect of peer influence (Kandel 1978; Coie & Miller-Johnson 2001; Warr 2002).

As noted above, addressing the issue of reciprocal causality requires longitudinal data like that collected in the Add Health study (see chapter 2). Thus, the current research, which uses the Add Health data, is able to isolate the independent effects of factors about peers by accounting for the general tendency of individuals to select into peer groups whose members are behaviorally similar to them. That is, the Add Health data make it possible to control for adolescents' prior criminal behavior in examinations of how peers' behavior influences adolescents' later involvement in crime. The ability to isolate the independent effects of peers' behavior on adolescents' own behavior makes it possible to explicitly test hypotheses about how peers influence the victim-offender overlap.

Defining Peer Groups

It is the group nature of offending (Hindelang 1976; Zimring 1981; Warr 1996)

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that first led criminologists to theorize that peer groups were critical to understanding the etiology of crime. The minimal definition of a group requires only that two or more people interact (Shaw 1981; Warr 2002). However, some researchers argue that additional elements, such as members perceiving themselves as a group, having shared norms, having shared goals, or being interdependent, are necessary to classify a collection of people as a group (Shaw 1981; Warr 2002). Criminologists almost universally construct measures of peer groups, particularly delinquent peer groups, using respondents' reports about their "friends" or "close friends" (Haynie 1999: 22-24; Warr 2002), and a collective of friends meets at least the minimal definition of a group. However, it is not clear whether this traditional criminological measure of peer groups meets the standards of the additional elements noted above.

Some studies of peer groups report that, compared to non-delinquents, delinquent adolescents' friendships are short-lived (Warr 1996), exploitive and detached (Hirschi 1969), and unorganized (Warr 2002). If so, then a collective of delinquent friends does not meet the criteria of a more complex definition of group because, even though delinquents are likely to interact, they probably are not interdependent and probably do not perceive of themselves as a "group." In contrast, other studies suggest that delinquent and non-delinquent friendships are similar on such dimensions as intimacy, social support, and attachment to friends (Giordano et al. 1986; Kandel & Davies 1991). These findings suggest that a collective of delinquent friends does meet the additional criteria of the more complex definition of a group.

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Because of the ambiguity surrounding delinquent and non-delinquent adolescents' friendship characteristics and "because it is preferable to treat most features of groups as variables rather than as definitional attributes" (Warr 2002: 5), the current study defines a peer group in terms of adolescents' friendship groups or networks. Thus, peer groups in the current study are conceptually similar to the peer groups described in most prior criminological research.

Peer Groups and Offending

Adolescents are a particularly appropriate population for examining how peers influence the victim-offender overlap. Peer groups become increasingly central to adolescents' lives as they begin to distance themselves from parents and other adults (Cairns & Cairns 1994). Friendships with peers account for a larger proportion of the social networks of adolescents than of younger children (Brown 1982), and peer group interactions occupy a substantially larger proportion of their time. For example, one study found that high school students spend about 16% of their waking time socializing with peers, and this was their most frequent free-time activity (Larson & Kleiber 1993). Moreover, adolescence is also a period of rapid change in exposure to delinquent peers-moving from very little exposure during the preteen years, to heavy exposure during the middle to late teens, and then declining into early adulthood (Warr 2002: 96).

The distribution of exposure to delinquent peers across age is nearly identical to the age-crime distribution. Although some have argued that the age-crime relationship, one of the longest standing criminological findings, is not the result of any known

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criminological factor (Hirschi & Gottfredson 1983), there is evidence suggesting that peer associations account for a moderate portion of the effect of age on offending (Warr 1993; Warr 2002). Additionally, peer-group-related factors also mediate the effects of other influential predictors of offending, such as gender and school achievement (Osgood et al. 1996; Haynie 1999; Warr 2002).

Prior research has focused on three peer group characteristics to explain the peers-delinquency relationship: the frequency of peer interactions, the number of adolescents' delinquent peers, and the extent of these peers' involvement in crime (Akers 2001; Warr 2002). In general, as peer interactions become more frequent, as the number of delinquent peers increases, and as the extent of peers' involvement in crime increases, the likelihood and extent of adolescents' own offending also increases (Akers et al. 1979; Matsueda & Anderson 1998; Haynie & Osgood 2002; Warr 2002). In fact, a number of studies find that the effect of association with delinquent peers on delinquency is stronger than that of any other variable included in the analyses (Akers et al. 1979; Warr & Stafford 1991).

Additionally, recent research suggests that the nature of peer friendship conditions the effects of many peer group characteristics on adolescents' own offending. For example, Agnew (Agnew 1991) reported that peer groups have a stronger influence on adolescents who report friendships that are more intimate and who more frequently interact with their peers than on adolescents who report weaker friendships and infrequent peer interactions.

Although prior research has clearly established that peer groups influence

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adolescents' risk for offending, the causal mechanisms underlying this relationship remain unclear. As some have noted, much of the difficultly involved in identifying the causal mechanisms underlying the relationship between peers and delinquency concerns the almost limitless number of ways peers might influence adolescents' involvement in crime as offenders (Rosenfeld et al. 2002; Warr 2002).

The social learning perspective has guided much of the research examining the peers-delinquency relationship. The essence of social learning theories is that people learn criminal behavior during interactions with primary members of their social groups, and with their peers in particular (Sutherland & Cressey 1955; Burgess & Akers 1966; Akers et al. 1979). Learning about crime, or any other behavior, involves learning about (a) the practical aspects of how to commit crime, (b) whether and how the criminal behavior is rewarded (a reinforcement process), and (c) imitating (or acting out) the criminal behavior (Sutherland & Cressey 1955; Akers et al. 1979). From this perspective, people become offenders when, through social interactions with others, they adopt more attitudes and values that are supportive of law violations than attitudes and values that prohibit law violations (Sutherland & Cressey 1955). The attitudes and values supportive of delinquency "transfer" from delinquents to non-delinquents. In other words, "bad" kids spoil "good" kids by altering their attitudes and values (Warr 2002: 6).

The findings that the likelihood of adolescents' own offending increases as the number of and interactions with these delinquent peers increases are consistent with the social learning perspective's transference thesis. This thesis suggests that the frequency of peer interactions is important because people are most likely to "learn" from those they

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associate with most often (Sutherland & Cressey 1955; Akers et al. 1979). Because people learn behaviors through observation and imitation (Burgess & Akers 1966; Akers et al. 1979), as the frequency of an adolescent's association with delinquent peers increases, so do the opportunities for him or her to learn about crime.

The transference thesis suggests that the number of adolescents' friends who are delinquent influences their own offending because as this number increases, so does the number of people modeling (or "teaching") them about criminal behavior. Moreover, the more delinquent peers an adolescent has, the more likely he or she is to interact with a delinquent other, that is, the frequency of association with delinquent peers is likely to increase (Agnew 1991).

Prior research has provided only moderate support for the social learning perspective's transference thesis. One flaw in this thesis is its assumption that offenders must hold attitudes and values supportive of law violations (Warr & Stafford 1991). Social learning theories suggest that crime is the result of adolescents' internalization, or private acceptance (Warr 2002), of attitudes and values supportive of crime. Internalization occurs when people not only act in accordance with group expectations, but also change their attitudes and values so that "they believe as the group believes" (Kelman 1958; Kiesler & Kiesler 1970: 4). In other words, peers' delinquency influences an adolescent's own offending because he or she comes to believe that learned criminal behaviors are practically possible, socially acceptable or desirable, and rewarding.

However, research on peer influence suggests that another process, compliance, may also explain the effect of peer delinquency on adolescents' own offending.

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Compliance occurs when people act in accordance with group expectations, but do not personally adopt the underlying attitudes and values (Kelman 1958; Shaw 1981; Warr & Stafford 1991). More specifically, people act in accordance with group expectations because they want to maintain positive relationships with their peers (Kelman 1958; Warr 1993; Warr 2002), because they value some social reward for doing so, or because they fear some social punishment for not doing so (Kelman 1958; Akers et al. 1979; Akers 2001). Notably, compliance is independent of individuals' actual values and attitudes. Consequently, people not only engage in behaviors about which they hold neutral attitudes and values, but they may also engage in behaviors that directly violate their own values and attitudes (Warr 2002).

Using data from the National Youth Survey, Warr (Warr & Stafford 1991) examined whether attitude transference (internalization) was the primary causal mechanism through which peers' delinquency influenced adolescents' own offending. To address this issue, Warr compared the effects of peers' attitudes about crime (i.e., how much respondents think their peers would approve or disapprove of the respondent committing a number of different offenses) to the effects of peers' behaviors (i.e., respondents' reports about how many of their peers had committed a number of different offenses) on adolescents' attitudes toward crime (i.e., how much respondents approve or disapprove of committing a number of different offenses) and offending (i.e., cheating, theft, and marijuana use).

The results of Warr's research indicated that peers' favorable attitudes about crime increased adolescents' involvement in crime only indirectly, by increasing their

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favorable attitudes toward crime (Warr & Stafford 1991: 856). However, peers' criminal behaviors significantly influenced adolescents' criminal behavior both indirectly (i.e., by increasing adolescents favorable attitudes toward crime) and directly (Warr & Stafford 1991). Moreover, the effect of peers' criminal behavior on adolescent offending was greater than that of any other variable included in the models (Warr & Stafford 1991: 857).

Overall, these results provide only modest support for the social learning perspective's transference thesis (Jensen 1972). Because peers' actual criminal behavior, rather than their attitudes about offending, had the strongest and most robust effects on adolescents' own attitudes and behaviors, Warr concluded that attitude and value transference, although it plays some role, is not the primary causal mechanism underlying the relationship between peers and delinquency (Warr & Stafford 1991). Warr suggested that two mechanisms from the social learning perspective, differential reinforcement and imitation, seemed promising for future research into the peer-delinquency relationship (Warr & Stafford 1991).[3] Differential reinforcement reflects the fact that most people learn about appropriate behaviors by observing the outcomes of their own and others' behavior, and imitation reflects the fact that another component of the learning process involves modeling the behavior of others (Akers et al. 1979; Tedeschi & Felson 1994).

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[3] In particular, Warr focused on "vicarious" reinforcement, in which adolescents' learn to interpret the consequences of delinquency through observing their peers' behavior and how others respond to that behavior. Warr also acknowledged the importance of direct reinforcements in the social learning process, but focused on vicarious reinforcement and imitation as potential underlying causal mechanisms in the peers-delinquency relationship because "they are the most purely *social* process" (Warr & Stafford 1991: 853).

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Both differential reinforcement and imitation highlight the importance of the compliance component of peer influence, in that neither factor requires that adolescents hold attitudes and values supportive of law violations in order to commit delinquent acts. Differential reinforcements are the anticipated or actual consequence of a behavior (Akers 2000). Reinforcements can be either social (e.g., ridicule or respect) or tangible (e.g., pleasure or discomfort) and in the form of gains (i.e., positive reinforcements) or losses (i.e., punishment) (Akers et al. 1979; Akers 2001). For example, when adolescents observe that peers' criminal behavior enhances their social status, then adolescents are more likely to engage in the behavior themselves. Imitation occurs when people observe and then copy the behaviors of others, and positive reinforcements increase the likelihood of imitation (Tedeschi & Felson 1994).

Unfortunately, data limitations prevented Warr from examining whether differential reinforcement and imitation explain the peers-delinquency relationship (Warr & Stafford 1991). In fact, the methodological complexities involved in collecting data suitable to address the effects of differential reinforcement and imitation on delinquency (for a review of these issues see Warr & Stafford 1991: 863; Warr 2002: 120-124) have slowed research in this area considerably. However, research examining another potential causal mechanism underlying the peers-delinquency relationship, opportunity, has made important gains.

As noted in the section on the victim-offender overlap above, the three necessary conditions for crime are a motivated offender, a suitable target, and the absence of capable guardianship (Cohen & Felson 1979). Although routine activity theory provides

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a relatively complete treatment of targets and guardians, it simply assumes a supply of motivated offenders- leaving the origins of offending to other theoretical perspectives. In a natural extension of the routine activity perspective to individual offending, Osgood and his colleagues (Osgood et al. 1996) replaced the concept of the motivated offender with the proposition that the motivation for crime is inherent in the situation (situational motivation) (Briar & Piliavin 1965), rather than the individual. Arguing that crime is most likely to occur when a situation makes committing an offense easy and rewarding, Osgood et al. (1996) detailed the characteristics of routine activities that increase situational inducements to offending.

Based on analyses of data from the Monitoring the Future study, Osgood and his colleagues reported that individuals' risk for offending increases directly with the amount of time spent with peers in unstructured activities with peers in the absence of authority figures (i.e., individuals whose roles obligate them to exert social control to interrupt or prevent crime) (Osgood et al. 1996). The authors argued that these circumstances are conducive to crime for three reasons (Osgood et al. 1996: 651). First, the lack of structure leaves time available for offending. Second, peers can make committing crime easier because they provide information about potential targets, serve as lookouts, and help to diffuse responsibility, and they can make crime more rewarding by increasing the associated symbolic rewards (e.g., enhanced social status). Finally, the absence of authority figures reduces the potential for outside attempts to exert social control in response to offending.

Haynie and Osgood's (Haynie & Osgood 2002) research on the combined impact

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of time spent with peers and the delinquency of those peers provides support for the thesis that opportunity plays an important role in the peers-delinquency relationship. Using data from the Add Health study, their study examined whether the association of problem behavior with unstructured socializing is a spurious result of youths who spend more time in this way simply having friends who are more delinquent. Their results indicated that both peer delinquency and unstructured socializing with peers had substantial influence on delinquency. Controlling for peer delinquency did not diminish the relationship between unstructured socializing and delinquency, and the influence of unstructured socializing did not depend on having delinquent peers (Haynie & Osgood 2002). Because peer delinquency continued to increase the likelihood of adolescents' own delinquency even after controlling for unstructured socializing, the results indicated that situational opportunity is not the only mechanism underlying the peers-delinquency relationship (Haynie & Osgood 2002).

In addition to making a significant theoretical contribution to our understanding of the causal mechanisms underlying the peers-delinquency relationship, the Haynie and Osgood (2002) study also addressed an important methodological issue: the use of subjective indicators of peers' delinquency. Measures of peer delinquency in most prior research are based on respondents' reports about their friends' behavior, rather than their friends' own reports (Haynie 1999). However, there is good reason to believe that adolescents' reports about their friends more accurately reflect their own, rather than their friends', behaviors and attitudes (Davies & Kandel 1981; Billy et al. 1984; Bauman & Fisher 1986; Jussim & Osgood 1989; Zhang & Messner 2000; Conway & McCord 2002).

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Research in social psychology indicates that people tend to overestimate the attitude and behavioral similarities between themselves and those they like (Wilcox & Udry 1986; Jussim & Osgood 1989). Additionally, studies of adolescent drug use and other delinquent behaviors (e.g., fighting and sexual promiscuity) have consistently reported that adolescents' perceptions of their peers' delinquency are more strongly correlated with adolescents' own delinquency than with their peers' actual delinquent behavior (Davies & Kandel 1981; Billy et al. 1984; Jussim & Osgood 1989).

To the extent that adolescents' reports about their peers' delinquency are biased reflections of their own behavior, the effect of peer influence on adolescents' own delinquency is overestimated. Based on their analyses of data from the Add Health study, which includes information collected directly from adolescents' peers, Haynie and Osgood (Haynie & Osgood 2002) reported that the effects of peer influence on delinquency were substantially smaller than those reported in previous research. Moreover, the authors found that age and attachment to parents, factors previous research claimed were fully mediated by peers' delinquency, were significant predictors of delinquency, even after controlling for peers' self-reported delinquency (Haynie & Osgood 2002). Thus, the authors concluded: "it is no longer defensible to investigate [peer influence] using respondents' reports as measures of the attitudes, values, or behaviors of others" (Haynie & Osgood 2002: 39).

Relatedly, research on the victim-offender overlap suggests another way in which prior research has likely overestimated the effect of delinquent peers on juvenile delinquency: omitting controls for adolescents' victimization. Studies examining the

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effects of victimization on adolescents' risk for offending indicate that victimization is one of the strongest predictors of subsequent offending (Menard 2002; Shaffer & Ruback 2002). Because prior research on the peers-delinquency relationship has not included measures of adolescents' victimization, part of the observed effects of peer delinquency on adolescents' own offending may be the spurious result of their involvement in crime as victims. Therefore, the current study, which uses a measure of peer delinquency based on peers' own self-reports and controls for both adolescents' offending and their victimization, provides a more accurate estimate of the effects of peers' delinquency than has been possible in prior research.

Finally, recent research indicates that the one-dimensional measure of peer groups used in most prior research on the peers-delinquency relationship masks some of the more complex ways that peer groups influence offending. With only a few exceptions, prior research has measured delinquent peer groups by asking respondents to report how many of their friends are involved in delinquency and/or to report the extent (frequency) of their friends' delinquency. However, as Haynie noted in a series of recent studies (Haynie 2001; Haynie 2002; Haynie & Osgood 2002), this strategy assumes that the number of friendships is the most important component of peer influence and assumes that all adolescents are similarly influenced by the behavior of their peers, regardless of their position and status within the peer group. In contrast, Haynie reported that other measures of the structure and composition of peer groups also influence adolescent offending by differentially exposing adolescents to delinquent behavioral models, access to information about offending opportunities, and to rewards or deterrents for criminal

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involvement (Haynie 1999; Haynie 2001; Haynie 2002).

Peer group structure refers to the patterns of relationships among group members (Wasserman & Faust 1994), or the ways that group members are connected to one another. For example, peer groups differ in their density, that is, in how many of the members are connected to one another. Knowing about the structure of peer groups makes it possible to examine how an adolescents' position within that structure directs his or her behavior. The composition of peer groups refers to the achieved and ascribed characteristics of the members. For example, peer groups differ in how many of the members are delinquent and in how many are popular in school.

Although earlier work had examined how the multiplexity of adolescents' ties with their friends (i.e., the number of different contexts adolescents interact within, such as school, church, and neighborhood) (Krohn 1986; Krohn et al. 1988), Haynie's research was the first to incorporate formal social network methods to examine how peer group structure and adolescents' positions within the peer group influence the peers-delinquency relationship. In her analyses of the Add Health data, Haynie found, consistent with prior research, that peers' delinquency significantly increased the extent of adolescents' own delinquency (Haynie 2001; Haynie 2002; Haynie & Osgood 2002). However, she also identified three additional peer group factors that influence the peers-delinquency relationship. First, the greater the behavioral homogeneity of peer groups (e.g., a high proportion of delinquent peers), the stronger the association between peers' and adolescents' behavior (Haynie 2002:121). This result supports the social learning perspective's claim that peers influence adolescents' delinquency by differentially

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exposing them to delinquent and non-delinquent models. That is, as the proportion of adolescents' delinquent friends increases, so does the number of others who model delinquent behaviors.

Second, Haynie also found that the density of peer groups influenced the peers-delinquency relationship, although its effects were dependent on the extent of peers' delinquency. Among adolescents with no delinquent friends, peer group density decreased the likelihood of adolescent delinquency. However, as the extent of peers' delinquency increased, peer group density increased the likelihood of adolescents' own delinquency (Haynie 2002:1043). Finally, adolescents' positions within the peer group structure influenced the peers-delinquency relationship in much the same way as peer group density. That is, among adolescents with no delinquent friends, adolescents who occupied a more central position within their peer group (i.e., had relatively more ties with other group members) were less likely to be involved in delinquent behavior than adolescents who occupied more peripheral positions in their peer group. However, as the extent of peers' delinquency increased, adolescents who occupied more central positions in their peer groups were significantly more likely to be offenders than adolescents in less central positions (Haynie 2002:1043).

The current research builds on and extends Haynie's research in two ways: (a) by examining how peer group characteristics influence adolescents' involvement in crime as victims and by exploring how formal social network measures influence the victim-offender overlap.

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Peer Groups and Victimization

Because peer groups occupy a prominent role in adolescents' lives and because most factors that predict adolescent offending also predict adolescent victimization, there is good reason to suspect that peer groups influence adolescents' risk of victimization. Only a very few criminological studies have explicitly examined whether there is a relationship between peer delinquency and adolescent victimization (Fagan et al. 1987; Lauritsen et al. 1991; Schreck et al. 2002; Schreck et al. 2003), and existing theory does not adequately address how peer groups might influence adolescents' risk of victimization more generally.

Adolescents with relatively few friends may make ideal crime targets for three reasons. First, adolescents who have relatively few close friends or who have relatively infrequent social peer interactions are less "personal" to others, are less likely to be protected by others, and, thus, are better candidates for victimization. Second, from a routine activity perspective, a relatively large peer group may help to discourage others from targeting group members as victims, because there are a relatively large number of "guardians" available to protect adolescents and their property. Finally, peer groups provide members with social support and social status, and they help maintain emotional well-being by increasing members' self-esteem (Smith & Tyler 1997), all of which are negatively related to adolescents' risk for victimization (Hodges & Perry 1999).

However, adolescents with a relatively large peer group may also make ideal targets for victimization for three reasons. First, because offending is especially likely

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during adolescence and young adulthood, adolescents with a relatively large peer group or who have relatively frequent peer interactions have a relatively high exposure to potential offenders. Second, adolescents with a relatively large peer group have greater opportunities for unstructured socializing with peers in the absence of authority figures, which increases their exposure to situations that carry a high risk for victimization. Finally, adolescents with relatively large peer groups may be more vulnerable to victimization because they have greater "social visibility." That is, victimizing adolescents with relatively large peer groups may result in greater social status enhancement, because more people are likely to know about the event.

In addition to the number of peers, it is likely that peers' behavior also influences adolescents' risk of victimization. Just as association with delinquent peers increases adolescents' offending, adolescents' association with victimized peers may signal to potential offenders that they are appropriate targets for victimization (e.g., they are not able to adequately defend themselves). Moreover, association with delinquent peers may increase adolescents' risk for victimization for three reasons. First, because offending may invite retaliation from victims (Black 1983; Singer 1986; Jacobs et al. 2000), adolescents who associate with delinquent peers may be at an increased risk of victimization because of the offending behavior of their peers, even if they have not committed an offense themselves (e.g., they are present during the retaliation or are targeted as an acceptable substitute for a delinquent peer). Second, association with delinquent peers may indirectly increase adolescents' risk for victimization by increasing their involvement in crime as offenders. Finally, adolescents who associate with

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delinquent peers may be at increased risk of victimization at the hands of their peers.

Again, because many of the same factors similarly influence victimization and offending, Haynie's studies of the influence of peer group structure on adolescent offending suggests that peer group structure may shape adolescents' risk of victimization. However, existing criminological theory does not provide much guidance for predicting whether various structural characteristics of peer groups increase or decrease adolescents' risk of victimization.

For example, adolescents in relatively dense peer groups (i.e., peer groups in which most members are connected by friendships) may be at increased risk of victimization because information about their vulnerability to crime (e.g., they have property worth taking or are not able to defend themselves) is readily available to others. Relatedly, information about adolescents' offensive behavior (e.g., gossiping, betrayal, or actual criminal offending) "flows" more easily through relatively dense networks (Taylor 1969; Wasserman & Faust 1994; Hanneman 2002) and, consequently, may invite criminal retaliation. Alternatively, dense peer groups may protect adolescents against victimization. For example, relatively dense peer groups, in which most adolescents know and interact with one another, may make it easier for adolescents to marshal protection and support from their peers when they feel threatened (Schreck et al. 2003).

By itself, criminological theory provides little insight into whether various peer characteristics should primarily increase or decrease adolescents' risk for victimization. However, the social network perspective, which argues that the structure of social relations influences individuals' behavior independent of their own characteristics and

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behavior, can help to sort out the contradictory implications of criminological theory for the peers-victimization relationship. In the next section, I review the implications of the social network perspective for the peers-victimization relationship and then, guided by criminological theory, develop formal hypotheses about how peer groups factors should influence not only the peers-victimization relationship, but also the relationship between victimization and offending.

The lack of theoretical attention to the peers-victimization relationship is reflected in the absence of research in this area. In a thorough review of the literature, I found only four studies that have explicitly examined how peers help to shape adolescents' risk of victimization. First, Lauritsen et al.'s (Lauritsen et al. 1991) examination of the victim-offender overlap using data from the NYS (which I reviewed above in the section covering the victim-offender overlap), produced evidence that association with delinquent peers increases adolescents' risk of victimization. Moreover, the results of this study suggest that the peers-victimization relationship may be reciprocal (Lauritsen et al. 1991:286). However, because the authors' measure of peer delinquency incorporated adolescents' own offending, the implications of these findings for the peers-victimization relationship remains unclear.

A second study of the relationship between victimization and offending (Fagan et al. 1987) also provides evidence that delinquent peers increase adolescents' risk of both offending and victimization. Using data from the National Youth Survey, Fagan et al. (Fagan et al. 1987) found that peer delinquency significantly increased adolescents' risk of victimization and that this effect was comparable to the effect of peer delinquency on

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adolescents' risk for offending (Fagan et al. 1987:602-3). However, the measure of peer delinquency in this study has two limitations. First, because the authors did not include a measure of adolescents' own delinquency in their models, their measure of peer delinquency confounds the effects of peer influence and adolescents' tendency to select friends who are similar to them (Gottfredson & Hirschi 1990). Secondly, the fact that their measure of peer delinquency was based on adolescents' reports about their friends' behavior rather than their friends' self-reports, confuses adolescents' own offending with that of their friends (Jussim & Osgood 1989).

In a third study examining the effects of delinquent peers on adolescent victimization, Schreck et al. (2002:169) argued that individuals with low self-control[4] were at greater risk for victimization, in part, because they are likely to associate with delinquent others. Drawing from research on the victim-offender overlap, the authors argued that delinquent peer associations increase adolescents' risk for victimization for three reasons. First, association with delinquent peers increases adolescents' exposure to motivated offenders (i.e., friends with relatively low self-control) who are likely to victimize them. Second, delinquent peer associations increase adolescents' exposure to situations that carry a high risk for victimization (i.e., unstructured socializing with peers in the absence of authority figures). Finally, the authors claimed that delinquent peer groups are at high risk for retaliation from other delinquent peer groups (Schreck et al. 2002:163).

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[4] As noted above, self-control refers to the extent to which people are able to internally regulate their behavior. More specifically, individuals with low self-control are likely to engage in behaviors that bring short-term gains but carry long-term negative consequences (Gottfredson & Hirschi 1990).

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Consistent with their hypotheses, the authors reported that as adolescents' self-control increased, their risk for victimization decreased and the number of their delinquent peers decreased. Additionally, the results indicated that delinquent peer associations increased adolescents' risk for victimization both directly and indirectly (i.e., by increasing unstructured socializing). However, the results of this study should be seen as tentative for three reasons. First, the study uses a measure of delinquent peers based on adolescents' reports about their peers' criminal involvement. As noted above, this operationalization confounds adolescents' own offending with that of their friends. Second, and related to the first reason, the statistical models of adolescents' risk for victimization do not include a measure of adolescents' own delinquency. Thus, some portion of the effect of peer delinquency actually reflects delinquent adolescents' tendency to select friends who are similar to them.

Finally, these results (Schreck 1999) must be interpreted cautiously because the study relies on cross-sectional data and includes only a limited number of control variables. As the authors acknowledged (Schreck et al. 2002:176), their cross-sectional analysis made it impossible for them to test their assumptions about the causal ordering and priority of the variables in their model. Nevertheless, the authors pointed to the fact that even if they changed their assumptions about the causal ordering of their model, the direct effects of self-control, peer delinquency, and unstructured socializing on adolescent victimization would not have changed. However, it is not clear how the results might have differed if the models had included statistical controls for the effects of prior victimization, one of the strongest predictors of both adolescent victimization and

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offending.

Only one study to date has explicitly examined the effects of peer group structure on adolescents' risk for victimization. Using public release data from the Add Health study, Fisher and her colleagues (Schreck et al. 2003) replicated Haynie's (Haynie 2001) examination of the peers-delinquency relationship using violent victimization as their outcome measure. The results of this study (Schreck et al. 2003) are generally consistent with Haynie's (2001) findings regarding the effects of peer group structure on adolescent offending. Overall, the authors found that two peer group characteristics, density, and centrality, influenced adolescents' risk of victimization and that the effects of these variables were dependent on peers' delinquency.[5] Specifically, adolescents who were part of dense peer groups or who occupied central locations in their peer group (i.e., had ties with most others in their peer group) were at a decreased risk of victimization, but only if the peer group was conventional (Schreck et al. 2003:9). Among adolescents who were part of relatively delinquent peer groups, higher peer group density and greater centrality in the peer group increased adolescents' risk of victimization.

The results of Fisher and her colleagues' research (2003) represent an important first step in understanding the relationship between peers and victimization. The finding that peer group characteristics are significant predictors of adolescents' risk of

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[5] In the authors' description of their results, they claim that the only network characteristic that significantly influences victimization after controlling for other important predictors is density (Schreck et al. 2003). However, the authors' tables indicate that both density and centrality are significant predictors of victimization. Because the authors did not include the standard errors of the coefficients in the tables presenting their results, it is not possible to compute t-values and, thus, to determine whether the text or the tables misrepresent the effects of centrality on victimization. Because the authors' refer to "dense, cohesive networks," a description that implies centrality is important for understanding victimization risk, my review of the Fisher et al. (2003) study assumes that centrality is an important, if not statistically significant, predictor of adolescents' risk of victimization.

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victimization suggests that further research on the peers-victimization relationship is warranted. Furthermore, because the results of the Fisher et al. study are generally consistent with research examining the effects of peer group characteristics on adolescent offending, the study also supports the claims that peers may account for the relationship between victimization and offending. The current research builds on and extends Fisher et al.'s work in three ways: (a) by constructing and examining how social network measures that incorporate information about adolescents' complete network of peer associations influence victimization, (b) by exploring how formal social network measures (see the section below) influence the victim-offender overlap, and (c) by incorporating a broader range of structural peer group characteristics into the model (see chapter 2).[6]

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[6] I am grateful to Fisher, Schreck, and Miller for providing me with an advance copy of their paper and I caution readers that the version of their study reviewed here may differ substantially from a subsequent published version. Moreover, because this is an advance copy of the paper, the authors may have subsequently addressed the limitations of this work and, thus, I do not review them here. Nevertheless, because the authors provide very little methodological information about the study in this version of their paper, it is difficult to assess exactly what kind of peer relationships the authors are working with or how the field should interpret their findings. In particular, three related issues complicate the study. First, of the 6,504 cases included in their version of the public release Add Health data, a substantial number of adolescents were asked to nominate only up to two friends. Thus, although the authors discuss "networks," for many of cases included in their analyses they have respondent-level information about triads and dyads only. Second, the authors did not restrict their sample to adolescents included in the special "saturation sample" (see chapter 2 for details), which includes information about respondents' complete network of associations. Thus, their measures of social networks are based on incomplete information, and it is not clear how their results might have differed if they had restricted their analyses to adolescents with complete network information. In fact, the authors note that adolescents who were allowed to nominate only two friends were part of peer groups that were significantly more dense than adolescents who were asked to nominate up to ten friends. Finally, the authors appear to have used the pre-constructed network measures included with the Add Health data, but they do not specify whether they used measures reflecting only those peers whom an adolescent nominated as friends or measures that also incorporated information about respondents who nominated the adolescent as a friend. Knowing which type of measures the authors used is important because the latter measure provides a more complete understanding of how "real world" social networks influence individuals' behavior than does the former.

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Social Network Perspective

Criminological theory and research have focused primarily on how the existence of peer groups (e.g., peer attachment) and peers' characteristics (e.g., attitudes and offending) affect adolescents' criminal involvement; and they have given little attention to the effects of patterns of connections among peer group members on crime. Nevertheless, recent research suggests that peer group structure and adolescents' positions within that structure are important determinants of adolescent crime (McCarthy & Hagan 1995; Haynie 2002; Schreck et al. 2003). Moreover, given criminologists' historical concern with the influence of social structure, incorporating the social network perspective into research on the peers-crime relationship is especially appropriate. The term "social network" refers to sets of nodes (i.e., actors) and the ties, or relations (e.g., friendships), among those nodes. What makes this perspective unique is its focus on the pattern of relations among actors, rather than on individual actors or their attributes (Hanneman 2002).

In particular, three propositions guide the social network perspective:

" • [1] Actors and their actions are viewed as interdependent rather than independent, autonomous units

- [2] Relational ties (linkages) between actors are channels for transfer or "flow" of resources (either material or nonmaterial)

- [3] Network models focusing on individuals view the network structural environment as providing opportunities for or constraints on individual action" (Wasserman & Faust 1994:4)

These propositions illustrate that incorporating the network analytic framework into research on the peers-crime relationship in particular, and on the victim-offender overlap

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more generally, makes it possible to explicitly examine the constraining effect of social structure (e.g., friendship groups) and of individual action and characteristics (e.g., offending and gender) (Tilly 1984:27; Coleman 1988:s96). Together, these two perspectives capture the two fundamental components of society: morphology and stratification. That is, the social network perspective describes the form and structure of social entities and the criminological perspective describes the distribution of individuals within that structure.

Social networks can be either egocentric or sociometric. Egocentric, or local, networks focus on the direct and indirect ties of individual actors with other actors (i.e., alters), and sociometric, or global, networks focus on the direct and indirect ties among all actors in the target population (e.g., students in a school). The traditional criminological notion of peer groups is of a single adolescent and those others the adolescent describes as "friends." The current research expands this understanding of peer groups by conceptualizing the "peer group" as a type of local network. In doing so, the current research more accurately reflects the "real world" complexity of peer groups. That is, adolescents' behavior is affected not only by their immediate friends, or those to whom they are directly linked, but also by their "friends' friends," or those to whom they are indirectly linked.

The social network perspective suggests that adolescents' involvement in crime as both victims and offenders is the result of differences in the opportunities and constraints that result from how they are embedded in their peer groups (McCarthy & Hagan 1995; Hanneman 2002). Two basic network properties, centrality and density, are important for

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understanding the victim-offender overlap. Each of these properties describes the position of a given adolescent within his or her peer group, as well as how connected all peer members are to one another. Knowing about these network properties is important because the connections among peer group members determine members' exposure to information as well as the ability of peer groups to mobilize resources and direct members' behavior (Grannovetter 1973; Bott 1957).

Figure 1 depicts the pattern of connections among two hypothetical peer groups and illustrates the concept of centrality for individuals and for groups. In terms of individuals, in peer group A, Tom has greater centrality than does Gary, because Tom is connected to more peer group members than Gary. In terms of groups, peer group B has greater overall centrality because each peer group member is connected with an equal number of others in the group. Generally, the greater the centrality of the peer group, the greater the capacity of the group to direct members' behavior (Freeman 1979; Wasserman & Faust 1994). Additionally, the greater the centrality of a given peer group member, the greater his or her personal capacity to direct the behavior of other group members and the more susceptible he or she is to the influence of others (Hanneman 2002). The current research examines the utility of two indicators of centrality: degree and closeness.

The concept of degree reflects the number of ties in a peer group and is an indicator of the amount of "activity" in the group or how "busy" any given member is (Wasserman & Faust 1994). Importantly, degree is also an indicator of the opportunities and choices available to an actor (Hanneman 2002). More concretely, degree represents

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the number of other peer group members with whom adolescents can easily interact and to whom they can turn for information and resources. The current study utilizes the Bonacich power centrality index, because it incorporates not only the in- and out-degree of a given adolescent, but also the in- and out-degree of other peer group members to whom the adolescent is connected.

Adolescents who have a high in-degree, or who are nominated as a friend by many others, occupy a relatively prominent position in the peer group. That is, other adolescents know and want to be known by them. Adolescents with a relatively high in-degree should have a lower risk of victimization because they have a greater number of potential guardians to protect them. However, adolescents with a relatively high in-degree are probably also at greater risk for offending because they have more opportunities for unstructured socializing with peers, access to more information about potential targets, and more resources for committing offenses (e.g., firearms).

In terms of the victim-offender overlap, adolescent victims with a relatively high in-degree may be less likely to commit a subsequent offense because they have greater peer resources for coping with the consequences of victimization. Alternatively, adolescent victims with a relatively high in-degree may be more likely to commit a subsequent offense because they have greater peer resources available to help them and perhaps greater pressure on them to retaliate against their offender. Conversely, adolescent offenders with a relatively high in-degree may be at increased risk for victimization because they are more "visible" to others and, thus, because their offensive behavior is likely to be known to many, it is easier for victims to justify retaliating

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against them.

The second indicator of centrality, closeness, reflects the social distance between all peer group members or between a given adolescent and other peer group members. Closeness is an indicator of peer group efficiency or the expected time it takes for information and resources to flow through a peer group (Freeman 1979; Wasserman & Faust 1994). More concretely, closeness is a measure of how many other peer group members an adolescent must go through in order to reach all members of the peer group. Closeness is a more sophisticated measure of adolescents' centrality than is degree, because, in addition to adolescents' direct ties, it also considers adolescents' indirect ties with other peer group members.

Adolescents with relatively greater closeness are better able to move information and resources through the peer group and to extract information and resources from the peer group than adolescents with relatively less closeness. Adolescents with greater closeness may be at lower risk of victimization than adolescents with lower closeness because information about potential threats reaches them more quickly and they are better able to protect themselves. Adolescents with greater closeness may be at increased risk for offending for similar reasons. That is, these adolescents are more efficient at extracting information and resources from their peer group and therefore have greater opportunities for offending.

In addition to centrality, this research focuses on a second property of peer groups, density, which reflects the overall level of connectedness in peer group. Density is a simple measure of peer group cohesion, in that the more connected peer group

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members are, the better able the group is to communicate its expectations about what is and is not acceptable behavior to its members (Bott 1957). The greater the ratio of actual to possible ties in a peer group, the greater the peer group's density (Wasserman & Faust 1994). Figure 2 depicts the pattern of connections among two hypothetical peer groups and illustrates that peer group B has greater density than peer group A.

Importantly, density is sensitive to the type of relational tie under consideration, and the more common the relation, the greater the density of the network is likely to be (Wasserman & Faust 1994). For example, friendship ties are more common than marital ties (the rising divorce rate notwithstanding) and, thus, networks constructed using information about friendship ties will necessarily be more dense than networks constructed using information about marital ties. Consequently, density is not a "true" structural characteristic of peer groups, in that it captures individuals' average social tendencies (e.g., to have more friends than marital partners) rather than emergent network properties (Wasserman & Faust 1994).

Given that density is sensitive to the type of social relation being measured, it is not surprising that both Haynie (Haynie 2001; Haynie 2002) and Schreck et al. (2003) found that the effects of density on adolescent involvement in crime as offenders and victims is dependent on peer delinquency. For example, in terms of the victim-offender overlap, peer group density probably increases the risk of subsequent offending only for adolescent victims whose peers are relatively delinquent themselves.

In summary, the social network perspective suggests that in addition to the attitudes, values, and behavior of peer group members, adolescents' involvement in crime

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as victims and offenders is the result of the structural characteristics of the peer groups within which they are embedded. Peer group structure affects adolescent criminal involvement by differentially exposing adolescents to delinquent behavioral models, access to information about offending opportunities, and rewards or deterrents for criminal involvement. Moreover, the incorporation of the social network measures into research on the victim-offender overlap sharpens the distinction between how individuals' characteristics (e.g., gender, experience as a victim, and time spent socializing with peers) and peer group characteristics (e.g., closeness, degree, and density) affect the relationship between victimization and offending.

School Context and the Victim-Offender Overlap

With regard to criminal events, contextual analyses of both juvenile and adult samples indicate that the social environment (e.g., neighborhood or school) in which individuals live significantly influences their risk of both offending and victimization over and above the characteristics of any individual (Lauritsen 2001; Morenoff et al. 2001; Rountree et al. 1991; Sampson & Groves 1989; Gottfredson & Gottfredson 1985). For example, the proportion of single-parent households in a neighborhood generally increases the risk of violent offending for all neighborhood adolescents, even if a given adolescent resides in a two-parent household (Anderson 2002).

Although most criminological research, including research on the victim-offender overlap, has stressed the importance of community context for influencing individuals' involvement in crime as victims and offenders, there is good reason to believe that

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schools may be a more salient context in the lives of adolescents. In particular, there are five reasons why the school context, rather than the community context, is the more important influence on the relationships among victimization, offending, and peer groups. First, the organization of schools ensures that adolescents spend a large proportion of their days with other adolescents who are approximately the same age (Haynie 1999; Gottfredson 2001; Osgood et al. 2003). Consequently, the school environment increases adolescents' opportunities to form friendships and interact with others. Indeed, schools represent the context within which adolescents form and maintain the vast majority of their friendships (Ennett & Bauman 1994). Because the current study is particularly interested in how peers influence the relationship between victimization and offending, school context is almost certainly more important than neighborhood context.

Second, at least during the school year, the amount of time that adolescents spend in school is second only to the amount of time they spend sleeping (Timmer et al. 1985). Thus, it is reasonable to expect that school is the primary context around which adolescents organize their lives. Third, adolescents' peer groups are located within a larger structure of friendship ties in their school, and this larger network of peer associations may have important implications for the structure of the smaller peer groups that compose it, as well as for how effective these smaller groups are at directing members' behavior. For example, as the density of the school-level network of associations among adolescents increases, adolescents are more likely to know other students in the school. Thus, their behavior is more dependent on the constraints imposed by the larger network. Under these circumstances, the density of smaller peer groups

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may become less important for directing members' behavior.

The fourth reason for examining school context concerns findings from research on the victim-offender overlap. As noted above, research on the relationship between victimization and offending has produced mixed results about the role of social context. Although Sampson and Lauritsen (Sampson & Lauritsen 1990) reported that community factors were important for understanding the victim-offender overlap among adults, the results of two studies involving adolescents suggest that community factors are relatively unimportant (Lauritsen et al. 1991; Bjarnason et al. 1999). One explanation for these contradictory findings is that the community affects adults, whereas adolescents are affected more strongly by the school context and only weakly by the community. That is, school context may be more important than neighborhood context for explaining adolescent victimization and offending because of the central role school plays in adolescents' lives (Lauritsen et al. 1991; Elliott et al. 1998; Bjarnason et al. 1999). Finally, schools represent an important context within which much adolescent crime occurs. Although most crimes that occur on or near school campuses are typically less serious than crimes that occur off campus (Elliott et al. 1998; Gottfredson 2001; Kaufman et al. 2001), 56% of all juvenile victimizations take place at school (Elliott et al. 1998).

Previous research suggests there are three characteristics of schools that influence the relationships among peer groups, victimization, and offending: the size of the study body, the student-teacher ratio, and the overall attitudes and values that make up the school climate. Research consistently indicates that schools with a relatively small student body are better able to foster pro-social development, academic achievement, and

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a sense of school "community" (Gottfredson 2001; Gottfredson & Gottfredson 1985), all of which are negatively related to both victimization and offending. Moreover, the networks of associations among all students in a school necessarily become more dense as the size of the student body decreases, suggesting that networks in relatively small schools are better able to direct students' behavior than the networks in relatively large schools (Laub & Lauritsen 1998). Thus, a small student body is likely to lower adolescents' risk of involvement in crime as both a victim and as an offender.

Relatedly, the student-teacher ratio, which reflects the concept of authority figures in routine activity theory (Garofalo et al. 1987), is an important predictor of school crime rates (Gottfredson 2001; Kaufman et al. 2001). As the ratio of students to teachers increases, there are relatively fewer authority figures available to deter offending, model normative behaviors, and intervene on behalf of potential victims. Furthermore, as the student-teacher ratio increases, the ability of school authority figures to direct students' behavior likely weakens, and peer groups probably have greater influence over members' behavior. Thus, adolescents in schools with a relatively high student-teacher ratio are probably at greater risk of both victimization and offending; and the influence of local peer groups on victimization and offending is likely to be especially strong in these schools.

Finally, research suggests that the aggregate effect of school climate influences the relationships among victimization, offending, and peer groups. School climate, as used here, represents students' perceptions of various aspects of a school's environment, including the attitudes and values that govern interactions among students, teachers, and

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administrators (Welsh et al. 1999). To the extent that adolescents perceive their school's climate as "hostile" (based on their evaluations of the fairness of the school's rules, teachers, and other students), their schools will be less able to foster pro-social behavior. Moreover, in "hostile" schools adolescents are probably less likely to turn to faculty or other students for support and guidance, which may be particularly problematic for victimized adolescents. For example, victimized adolescents in schools with relatively hostile climates may be more likely to commit a subsequent offense, in part, because they perceive themselves as having fewer resources for coping with the consequences of victimization.

Unfortunately, as is common with most studies of victimization and offending, the Add Health data do not include information about where adolescents' victimizations and offenses occurred. Consequently, the current research cannot explicitly examine adolescent victimization and offending that occurs within and outside of schools. Nevertheless, in a multi-level study of the effects of neighborhood- and individual-level factors on victimization risk, Lauritsen (2001) reported that many of the contextual factors that influenced individuals' risk of victimization *within* their neighborhoods also significantly influenced their risk of victimization *outside* of their neighborhoods. One possible explanation for this finding is that ecological context promotes routine activities that individuals are as likely to engage in when they leave their neighborhoods as when they are within their neighborhoods.

Indeed, isolating the effects of, for example, neighborhood context from the effects of school context on adolescent involvement in crime is an enormously

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complicated task. This difficulty is due, in part, to the fact that adolescents bring their home and community experiences with them to their schools and bring their school experiences into their homes and communities, and in doing so, may alter the characteristics of each (Elliott et al. 1998). Moreover, because the characteristics of ecological contexts likely moderate the effects of characteristics from other contexts on adolescents' criminal involvement (Laub & Lauritsen 1998), the task of isolating the independent effects of a particular social context on adolescent crime is quite complicated. Despite the difficulty of isolating the independent effects of one context on adolescent crime from the effect of another, for the five reasons reviewed above, the current study is justified in focusing on how school, rather than community, context influences the relationships among victimization, offending, and peer groups.

Summary and Hypotheses

In sum, despite important gains in understanding the victim-offender overlap, three critical areas of research are undeveloped.

i. Are victimization and offending the result of the same social process?
    a. How do adolescents who are victims only, offenders only, who are both victims and offenders, and those who are neither victims nor offenders differ from one another?
ii. How do local peer networks influence the relationships between victimization and offending?

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a. Do peer groups influence adolescents' risk of victimization?

iii. How does school context affect the relationships among victimization, offending, and peer groups?

The current study addresses these three research areas guided by the hypotheses summarized below.

Hypotheses about the relationship between victimization and offending:

H_1: Victimization significantly increases the likelihood of offending, even after controlling for other important predictors

H_2: Offending significantly increases the likelihood of victimization, even after controlling for other important predictors

H_3: The relationship between victimization and offending is reciprocal, victimization and offending simultaneously increase the likelihood of one another

In contrast to claims that the observed relationship between victimization and offending may be the spurious result of peer group processes or the social context within which adolescents' live or go to school, the current research hypothesized that victimization and offending would continue to significantly increase the likelihood of another and that this relationship would be reciprocal.

H_4: The victim-offender overlap is the result of an underlying social process that produces both victimization and offending

H_{4a}: Activities that reflect unstructured socializing with peers are an important component of the social process underlying the victim-offender overlap

H_{4b}: Violent offending and neutral activities (i.e., not inherently criminal or deviant) are distinct from the more general construct of "deviant lifestyles," and will significantly increase the likelihood of adolescent involvement in crime even after controlling for alcohol and drug use

The victim-offender overlap reflects the fact that victimization and offending are common outcomes of an underlying social process. Adolescents' peer groups are an important, but not the only, component of the social process common to both victimization and offending. In particular, unstructured socializing with peers increases adolescents' risk of both victimization and offending. Other factors

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related to adolescents' risk of both victimization and offending, which previous research has conceptualized as being part of a deviant or delinquent lifestyle (e.g., alcohol and drug use), will also increase adolescents' risk for both victimization and offending; however, these factors are theoretically and empirically distinct from the neutral activity of socializing with peers.

Hypotheses about the influence of peer group characteristics:

H_5: Higher levels of offending in the peer group significantly increase the likelihood of adolescents' own involvement in crime as victims and as offenders

This positive influence reflects social learning processes, greater access to information about opportunities for offending, and peer group dynamics that encourage adolescents to conform to the group's norms.

H_6: Higher levels of victimization in the peer group significantly increase the likelihood of adolescents' involvement in crime as victims

This positive influence reflects social learning processes, peer group dynamics that encourage adolescents to conform to the group's norms, and the stigmatizing effect of victimization.

> H_{6a}: Levels of victimization in the peer group significantly influence adolescents' involvement in crime as offenders (exploratory- no prediction about the direction)

H_7: The influence of peer group density on adolescents' risk of subsequent victimization and offending is dependent on adolescents' prior involvement in crime

> H_{7a}: Among adolescents with no prior criminal involvement, peer group density has either no effect or a negative effect on adolescents' involvement in crime as victims and as offenders
> H_{7b}: Among offenders, peer group density increases the likelihood of subsequent offending

The hypothesized interaction effect between peers' criminal involvement and adolescents own criminal involvement reflects the fact that density is sensitive to the type of relational tie being considered.

H_8: The influence of centrality on adolescents' risk of subsequent victimization and offending is dependent on adolescents' prior criminal involvement

> H_{8a}: Among adolescents with no prior criminal involvement, centrality decreases the likelihood of victimization and offending
> H_{8b}: Among offenders, centrality increases the likelihood of subsequent

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victimization
H_{8c}: Among victims, centrality increases the likelihood of subsequent offending

The hypothesized interaction between centrality and adolescents' involvement in crime as victims and offenders is based on the findings of prior studies, which indicate that centrality is dependent on peer groups' level of criminal involvement.

H_9: Closeness significantly influences the likelihood of victimization and offending (exploratory, no prediction about direction of effects)
H_{10}: The influence of status prestige on adolescents' risk of subsequent victimization and offending is dependent on adolescents' prior criminal involvement

H_{10a}: Among adolescents with no prior criminal involvement, status prestige decreases the likelihood of subsequent victimization and offending
H_{10b}: Among victims, status prestige increases the likelihood of subsequent offending

These victims are more motivated to protect their status than are victims with lower status prestige.

H_{10c}: Among offenders, status prestige increases the likelihood of subsequent victimization

Others are more motivated to target these adolescents because of the increased status prestige that accompanies targeting adolescents who are involved in crime as offenders.

H_{11}: Being part of a peer group with high levels of offending multiplicatively increases the likelihood of subsequent victimization among offenders
H_{12}: Being part of a peer group with high levels of victimization multiplicatively decreases the likelihood of subsequent offending among victims

<u>Hypotheses about school context:</u>

H_{13}: School size (i.e., enrollment) is positively related to victimization and offending

This hypothesis reflects the fact that, compared to schools with relatively small student bodies, schools with relatively large student bodies are less able to foster pro-social development, academic achievement, and a sense of school

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"community."

H_{14}: School-level density is negatively related to victimization and offending

Schools where most adolescents are friends are better able to direct students' behavior toward pro-social involvement.

H_{15}: The student-teacher ratio is positively related to victimization and offending

The higher the student-teacher ration, the less able school authority figures are to interrupt opportunities for criminal involvement or to guard potential targets against potential offenders.

H_{16}: Hostile school climate is positively related to victimization and offending

The greater the hostility of a school's climate, the less likely adolescents are to turn to faculty or other students for help in handling actual and threatened victimization and, the less able school authorities are to foster pro-social adolescent development.

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Table 1. Significant Prior Research on the Victim-Offender Overlap

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Singer (1981) *(Victimization to offending)*	567 young adult, inner-city males from Philadelphia birth cohort (data collected in 1945 and 1972) *Both self-report and official data*	Simple and aggravated assault; rape; homicide; official arrest; contact with police as a juvenile	Simple and aggravated assault; property victimization	Victims and offenders are part of a violent subculture that imposes normative standards for participating in violence and responding to criminal victimization	Victimization substantially increases risks for offending; relationship strongest for violent crimes; victimization mediates relationship between race and offending;	Contributions: 1st study; clear empirical evidence of overlap; findings supportive of both routine activity and social learning theories; uses both self-report and official data; suggests relationship between victimization and offending may be reciprocal Limitations: No direct test of theoretical claims; limited generalizability of sample; long recall period; simple descriptive analyses
Gottfredson (1984) *(Offending to victimization)*	The British Crime Survey Approximately 11,000 British residents age 16 or older *Self-report data*	Assault; weapon carrying; minor offending (e.g., stealing office supplies); shoplifting; marijuana use	Violent Victimization; property victimization	Similar social processes, related to lifestyle, peer association, and area of residence, produce both victimization and offending	Victims and offenders share similar socio-demographic profiles; victimization substantially increases risks for offending, and the relationship is strongest for violent crimes	Contributions: 1st study to compare the socio-demographic characteristics of victims and offenders from the same sample; evidence that similar social processes produce both victimization and offending; lays the foundation for a routine activity explanation of the victim-offender overlap Limitations: No direct test of theoretical claims, simple descriptive analyses; no temporal ordering

Table 1 (cont.)

Study *(Assumed direction of relationship)*	**Sample**	**Offending Measure**	**Victimization Measure**	**Theoretical Claims**	**Results**	**Contributions & Limitations**
Singer (1986) *(Victimization to offending)*	567 young adult, inner-city males from Philadelphia birth cohort (data collected in 1945 and 1972) *Both self-report and official data*	Simple and aggravated assault; rape; homicide; official arrest; contact with police as a juvenile	Simple and aggravated assault; property victimization	Applies subcultural theory's proposition that victims of serious violence are often offenders- focus of study is to document the victim/offender pattern	Strong, positive bivariate and multivariate relationships between victimization and offending; relationship strongest for violent crimes; violent crimes; victimization mediates relationship between race and offending	Contributions: Suggests specific factors that may account for the victim-offender overlap; examines how severity of victimization accounts for severity of offending Limitations: Limited generalizability of sample; long recall period; no temporal ordering;
Jensen & Brownfield (1986) *(Offending to victimization)*	3,644 high school seniors from the 1981 Monitoring the Future Study (MTF); 550 high school students from Tucson, AZ. (FHS) *Self-report data*	MTF: Violent offending (4 items); property offending (3 items) FHS: Violent offending (2 items); property offending (4 items) drug use (unknown number of items); drag racing	MTF: Violent victimization (4 items); property victimization (3 items) FHS: Violent victimization (2 items); property victimization (3 items)	Offending is a type of routine activity that increases risk of victimization because of the "motives, vulnerability, or culpability" (p. 87) of those involved; activities that involve the pursuit of fun, excitement, and thrills (e.g., offending) are more victimogenic than activities that passively put people at risk (e.g., hanging out with friends, cruising around for fun)	Offending substantially increases risks for victimization; offending mediates relationship between gender and victimization; concludes that a more parsimonious explanation of victimization risk than lifestyle/routine activity theory is that "for personal victimizations, those most likely to be victims of crime are those who have been most involved in crime; and the similarity in characteristics of victims and offenders reflects that association." (Pp. 97-98)	Contributions: 1st study of victim-offender overlap that documents strong effect of offending on victimization; results strongly supportive of principle of homogamy; ultimately the study implies that low self-control accounts for both offending and victimization Limitations: Misinterprets routine activity theory; simple, descriptive analyses; no temporal ordering

Table 1 (cont.)

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Fagan, Piper, & Cheng (1987) *(Victimization to offending)*	666 adolescents from four inner-city, high crime neighborhoods *Self-report data*	Violent offending (3 items); property offending (4 items); drug sales; drug abuse; school crime; alcohol use; extortion;	Violent victimization (3 items); property victimization (4 items)	Uses integrated perspective of control and social learning theories; victims and offenders are isomorphic populations; similar factors produce both victimization and offending; strong personal and social bonds reduce the likelihood of both offending and victimization, offenders learn about violence by experiencing it first as victims; community factors account for the relationship between victimization and offending	Observe significant, small, positive effect of victimization on offending; the greater the severity or frequency of victimization the greater the severity of delinquent acts; victimization is a better predictor of less serious delinquent acts; conclude that different social processes produce offending and victimization; strong social bonds do not protect against victimization	Contributions: Only study to include direct indicators of internal and external social controls; supports social learning theory as explanation for overlap (i.e., association with delinquent peers increases likelihood of victimization and offending; finds that the overlap is not the product of social control Limitations: No temporal ordering; does not control for offending in models predicting victimization; limited generalizability of sample
Esbensen & Huizinga (1991) *(Offending to victimization)*	Denver Youth Survey 877 Denver youth ages 11 - 15 who lived in 'high-risk communities' *Self-report data*	Drug sales (2 items); minor theft (3 items); felony theft (3 items); minor assault (3 items); felony assault (3 items); alcohol use (3 items); marijuana use	Violent victimization (4 items); property victimization (2 items)	Offending is a type of lifestyle that increases adolescents' risk of criminal victimization	Strong, positive correlation between offending and victimization; victimization risk increased substantially with the number of different types of delinquency participants were involved in; relationships were particularly strong between violent victimization and violent offending	Contributions: 1st study of the victim-offender overlap to document socio-demographic similarities of victims and offenders; provides further support for notion of offending as a type of lifestyle; Limitations: Simple, descriptive analyses; limited generalizability sample; no temporal ordering

Table 1 (cont.)

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Mayhew & Elliot (1990) *(Offending to victimization)*	The British Crime Survey Approximately 11,000 British residents age 16 or older *Self-report data*	7 items: Stealing office supplies; pilfering from employer; inflating work expenses; evading: public transport fees, income taxes, custom duties; smoking cannabis	Violent victimization (unknown number of items); property victimization (unknown number of items)	Principle of homogamy; offending is a type of lifestyle that increases risk for victimization; peer interactions account for relationship between victimization and offending	A significant, bi-variate relationship between victimization and offending among the elderly only; victimization correlated with many of the same factors as offending and substance use	Contributions: Results suggest trivial offending is not related to victimization; supports principle of homogamy; Limitations: No direct test of theoretical claims; examines trivial offenses only; simple, descriptive analyses; no temporal ordering
Sampson & Lauritsen (1990) *(Offending to victimization)*	The British Crime Survey Approximately 11,000 British residents age 16 or older *Self-report data*	Assault; theft; vandalism; marijuana use; drunk driving;	Assault; personal theft	Offending is a type of lifestyle that increases risk for victimization; residential proximity to crime affects victimization risk independent of lifestyle and socio-demographic factors; principle of homogamy	Both violent and minor deviant behavior directly increase victimization risk; find support for principle of homogamy; ecological proximity to violence is an important structural determinant of victimization; offending mediates about half the effect of gender on victimization; violent offending has the strongest effect on victimization by people you know	Contributions: 1st study to incorporate community-level factors; 1st study to examine how victim-offender relationship influences victim-offender overlap; strong support for routine activity theory Limitations: No temporal ordering

Table 1 (cont.)

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Lauritsen et al. (1991) *(Offending to victimization)*	National Youth Survey 1,725 adolescents between the ages of 11 and 17 *Self-report data*	*Delinquent lifestyles:* Standardized sum of respondents' own delinquency (15 items reflecting both property and violent offending) and respondents' extent of involvement with delinquent peers (the product of time spent with peers per week and peers' involvement in delinquency)	Self-reported: assault; robbery; larceny; vandalism	Principle of homogamy; offending is a type of lifestyle/routine activity that increases risk for victimization; association with delinquent peers mediates part of the effect of offending on victimization; physical proximity to crime and social disorder directly influence victimization risk	In 15 of 16 models, the extent of adolescents' involvement in delinquent lifestyles had the largest direct effect on assault, robbery, larceny, and vandalism victimization; proximity to crime has a weak, but significant, direct effect on victimization risk; find evidence of a reciprocal relationship between victimization and delinquent lifestyle	Contributions: 1st study to test reciprocal relationship between victimization and offending; further evidence that community level factors influence the victim-offender overlap Limitations: Measure of delinquent lifestyles confounds respondents' own delinquency with that of their peers; measure of peer delinquency based on respondents' reports
Lauritsen et al. (1992) *(Offending to victimization)*	The National Youth Surveys (NYS): 1,725 adolescents between the ages of 11 and 17 at start of survey Monitoring the Future Study (MTF): 9,472 high school seniors *Self-report data*	NYS Theft; assault; vandalism; alcohol and marijuana use; traffic tickets and accidents, peer involvement in delinquency MTF Theft; assault; vandalism; alcohol and marijuana use; traffic tickets and accidents, peer involvement in delinquency	NYS Assault (beaten by other than parent or attacked with weapon); robbery (something taken by force) MTF Assault (injury with and without the use of a weapon and threats of injury with and without the presence of a weapon)	Involvement in conventional activities directly reduces adolescents' victimization risk; involvement in conventional activities indirectly reduces adolescents' victimization risk by decreasing their involvement in delinquent activities	Involvement in delinquent activities substantially increases adolescents' victimization risk; conventional activities have little effect on risk once socio-demographic characteristics and offending are taken into account	Contributions: Involvement in delinquent activities substantially mediated the effects of socio-demographic factors; further evidence that similar processes produce both victimization and offending Limitations: Measure of peer delinquency based on respondents' reports, rather than their own; no temporal ordering

Table 1 (cont.)

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Bjarnason, Sigurdardottir, & Thorlindsson (1999) *(Offending to victimization)*	The European School Survey Project on Alcohol and Drug Use 3,810 Icelandic 10th graders *Self-report data*	Alcohol use, marijuana use; threaten someone with weapon; theft; violent behavior (punched, kicked, hit, or head-butted someone)	Victim of violence during past twelve months (not explicitly defined)	Proximity to crime increases adolescents' victimization risk; adolescents' involvement in delinquent or violent lifestyles directly increases their victimization risk; similar social processes produce both victimization and offending	Violent offenders have the highest risk of violent victimization; proximity to crime did not substantially influence victimization risk; report the notable finding that threatening someone with a weapon is negatively related to victimization risk;	Contributions: Further evidence of generalizability of victim-offender overlap; evidence that community factors do not influence relationship between victimization and offending Limitations: No temporal ordering
Lattimore, Linster, & MacDonald (1997) *(Offending to victimization)*	3,395 youth paroled by the California Youth Authority during the 1980's *Official data*	Violent crimes (not explicitly defined); robbery; burglary; other property; drug offenses; other "minor" offenses	Homicide	Similar social processes produce both victimization and offending; offenders and victims are part of the same, homogenous population	Study finds that black youth from LA county are at an exceptionally high risk of homicide victimization; drug offenses and violence while incarcerated significantly predicted victimization risk	Contributions: Extends victim-offender overlap to homicide victimization; 1st study to find evidence of overlap using only official data Limitations: Limited generalizability sample; few control variables included in analyses
Dorbrin (2001)	Matched sample design of 105 homicide victims and 210 non-victims from Prince George County, MA. outside of D.C. *Official data*	Arrests for property, violent, and drug crimes	Homicide	Offending is a type of lifestyle that increases risk for victimization; association with delinquent peers accounts for part of the effect of offending on victimization	Homicide victims are 3.5 times more likely to have a prior arrest than are non-victims, all 3 types of offending increased risk of homicide victimization- but the relationship strongest for drugs and then violence; concludes offending is a type of lifestyle	Contributions: Extends overlap to account for homicide victimization among non-offender sample Limitations: No direct test of theoretical claims; limited generalizability sample; few control variables included in analyses

Table 1 (cont.)

Study *(Assumed direction of relationship)*	Sample	Offending Measure	Victimization Measure	Theoretical Claims	Results	Contributions & Limitations
Zhang, Welte, & Wieczorek (2001)	Buffalo Longitudinal Survey of Young Men 625 males from Buffalo New York, ages16 – 19 (over samples delinquents) *Self-report data*	Delinquent lifestyle: 34 items covering minor and serious property, violent, and drug offenses, alcohol and drug use	Violent victimization (3 items); property victimization (6 items)	Offending is a type of lifestyle that increases risk for victimization; relationship between victimization and offending is reciprocal because victims and offenders share similar lifestyles and values; area crime rates moderate the relationship between victimization and offending	Individuals engaged in deviant lifestyles have substantially higher rates of both property and violent victimization; effect of victimization on deviant lifestyle is short term only (finds significant reciprocal relationship, but no lagged effect); concludes delinquent lifestyles and victimization reflect underlying levels of low self-control	Contributions: Reports evidence consistent with claim that community factors moderate the victim-offender overlap; further evidence that the relationship between victimization and offending is reciprocal Limitations: Results may not generalize beyond sample (e.g., finds victimization not predicative of future victimization)
Menard (2002)	National Youth Survey 1,725 adolescents between the ages of 11 and 17 at start of survey *Self-report data*	Property and violent offending, drug use	Property and violent victimization, domestic violence victimization	None (empirical review)	Violent victimization in adolescence has both short (in adolescence) and long-term (in adulthood) effects on both property and violent offending; property victimization in adolescence predicted only property victimization in adolescence and adulthood	Contributions: Evidence that adolescent victimization (other than child abuse) has long-term effects on offending even after controlling for sociodemographic factors; frequency of adolescent victimization influences ability to successfully transition to adulthood Limitations: Limited number of control variables in analyses; does not control for offending in models predicting adult victimization

Table 1 (cont.)

Study *(Assumed direction of relationship)*	**Sample**	**Offending Measure**	**Victimization Measure**	**Theoretical Claims**	**Results**	**Contributions & Limitations**
Shaffer & Ruback (2002)	National Longitudinal Study of Adolescent Health 5,003 juveniles ages 11-17 *Self-report data*	Violent Offending (5 items), drug use (4 items), alcohol use	Violent Victimization (4 items)	Offenders are at increased risk for victimization because similar social processes (related to routine activities) produce both, substance use moderates the relationship between victimization and offending, association with other delinquent peers mediates the effect of offending on victimization	Victimization significantly increases risk for both subsequent victimization and offending; offending significantly increases risk for both subsequent victimization and offending, no evidence that gender, race, or substance use moderates the relationship between victimization and offending	Contributions: Further evidence that victimization and offending are the result of similar social processes; victimization is an important risk factor for violent offending; results widely generalizable Limitations: Does not directly examine effects of delinquent peers

* A complete list of prior studies of the relationship between victimization and offending appears in Appendix A

Table 2. Definition and calculation of variables included in research

Measure	Definition	Calculation
Dependent Variables		
Violent Offending	Captures respondent's involvement in 5 serious offenses against others: getting into a serious physical fight; hurting someone badly enough to require medical attention; using a weapon to get something from someone; pulling a knife or gun on someone; shooting or stabbing someone	Operationalized 2 ways: Binary (0-1); coded "1" if respondent reported involvement in any of the five items Count (0-5); number of items respondent reported involvement in
Violent Victimization	Measures respondent's experience as a violent crime victim based on responses to 4 items: someone pulled a knife or gun on you; someone stabbed or cut you; someone shot you; you were jumped	Operationalized 2 ways: Binary (0-1); coded "1" if respondent reported involvement in any of the four items Count (0-4) ; number of items respondent reported involvement in
Crime group	Measures respondent's criminal involvement	Respondents grouped into 4 categories: No crime (reference group) no reported criminal involvement during either year of the study Victim only coded "1" if respondent reported being victimized, but not committing any offenses, during either year of the study Offender only coded "1" if respondent reported committing an offense, but not being victimized, during either year of the study Overlap member coded "1" if respondent reported being both a victim and an offender during either year of the study

Table 2. (cont'd)

Measure	Definition	Calculation
Independent Variables **Peer and network measures**		
Socializing with peers	Measure of how much time respondent spends socializing with peers in 3 activities: spend time at friends' house; spend time with friends after school; spend time with friends on the weekend	Mean amount of time respondents spend socializing with their peers
Mean network offending	Mean value of violent offending items for the respondent's peer network	Mean offending = $\Sigma x_i / n_g$,where x_i = the count of violent offending for the i^{th} member of the respondent's peer network and n_g = the number of others in the respondent's peer network
Mean network victimization	Mean value of violent victimization items for the respondent's peer network	Mean victimization = $\Sigma x_i / n_g$, where x_i = the count of violent victimization for the i^{th} member of the respondent's peer network and n_g = the number of others in the respondent's peer network
Proportion of violent offenders in network	Proportion of others in respondent's network who report involvement in any of the violent offending items	Proportion violent = $\Sigma x_i / n_g$, where $x_i = 1$ if the i^{th} member of the respondent's peer network reports committing any violent offenses
Proportion of victims in network	Proportion of others in respondent's network who report experiencing any of the violent offending items	Proportion victimized = $\Sigma x_i / n_g$, where $x_i = 1$ if the i^{th} member of the respondent's peer network reports experiencing any violent victimizations
Size of peer network	Number of others in respondent's peer network	g = number of others in network
Isolate	Dummy variable indicating whether respondent has ties to others	Isolate = 1 No friends = 0

Table 2. (cont'd)

Measure	Definition	Calculation
In-degree	Count of the number of others who nominate the respondent as a friend	In-degree = $d_i(n_i)$
Out-degree	Count of the number of friendship nominations the respondent receives from others	Out-degree = $d_o(n_i)$
Density	Number of ties in respondent's peer network divided by the number of possible ties in the network	$D = (\Sigma L / (g-1)$, where L = number of actual ties in network
Closeness	Measures the distance between the respondent and others in the network that the respondent sends ties to	Closeness = $(g-1) / [\Sigma d(n_i, n_j)]$, where d = length of path between respondent and those whom the respondent nominates as friends
Bonacich centrality	Respondent's centrality, weighted by the centrality of others in the network that the respondent sends friendship nominations to	Centrality = $\alpha(I-\beta L)^{-1}L1$, where α = a scaling vector, β = a power weight (i.e., 0.10), and L = total friendship network
Status prestige	Respondent's relative prestige in his or her network weighted by the relative rank of others in the network that the respondent sends and receives friendship nominations from, corrected for attenuation (i.e., the lower influence of longer distances between people in network) and then normalized	$P_R = \Sigma ((x_{i1}P_R(n_1), x_{i2}P_R(n_2), \ldots x_{ig}P_R(n_g))'$, where x_{ig} = the in-degree (number of others who nominate the respondent) of respondent and of others in network who can reach the respondent directly or indirectly divided by g(g-1) (Wasserman & Faust 1994; Borgatti et al. 2002)

Table 2. (cont'd)

Measure	Definition	Calculation
Measures related to family		
Parental supervision	Measure of how often respondent's parents are home when he or she is based on 6 items: how often is your mom home when you leave for school; how often is your mom home when you return from school; how often is your mom home when you go to bed at night; how often is your dad home when you leave for school; how often is your dad home when you return from school; how often is your dad home when you go to bed at night	Mean of how often respondent's parents are home when the respondent is home
Two parent family	Dummy variable indicating whether respondent lived with two parental figures during both years of the study	Two parents = 1 One parent = 0
Intimacy with parents	Measure of respondent's relationship with parents based on 6 items: how close do you feel to mom; how much does mom care about you; mom is warm and loving; how close do you feel to dad; how much does dad care about you; dad is warm and loving	Mean of the intimacy of respondent's relationship with mom and dad
Parental communication	Measure of how often respondent talks with parents based on 8 items: talk with mom about a party or date; talk with mom about a problem; talk with mom about school work or grades; talk with mom about other school related topics; talk with dad about a party or date; talk with dad about a problem; talk with dad about school work or grades; talk with dad about other school related topics	Mean of how often respondent talks with mom and how often respondent talks with dad

Table 2 cont.

Measure	Definition	Calculation
Measures related to school		
Grade point average	Measures respondent academic achievement in 4 subjects: math; science; english; history	Mean grade point average
Hostile school climate	Measure of respondent's school climate based on 3 items: how often have trouble with teachers; how often have trouble with other students; teachers at school are fair	Mean level of respondent's perception of school climate
School attachment	Measure of how attached to school respondent is based on 3 items: feel close to people at school; feel like a part of the school; happy to be at your school	Mean level of respondent's attachment to school
Other control variables		
Age	Measures respondent's age in years at the time of the survey	Continuous variable in years (date of interview – respondent date of birth)
Age Squared	Controls for the inverse age-crime relationship	Continuous variable in years (age^2)
Male	Dummy variable indicating respondent is male	Male = 1 Female = 0
White	Dummy variable indicating respondent is white	White = 1 Person of Color = 0
Social support	Measure of how much respondent feels that others care about her/him based on 6 items: how much adults care about you; how much teachers care about you; how much parents care about you; how much friends care about you; how much your family pays attention to you	Mean level of respondent's perceived social support

Table 2 cont.

Measure	Definition	Calculation
Self-esteem	Measure of respondent's sense of self-worth based on 5 items: I have a lot of good qualities; I have a lot to be proud of; I like myself as I am; do things just about right; feel socially accepted; feel loved and wanted	Mean level of respondent's self-esteem
High physical maturity	Measure of respondent's relative physical development based on 4 items for males and 3 items for females: males- how much hair is under your arms; how thick is the hair on your face; how much lower is your voice than in grade school; how developed are you compared to others; females- how much have your breasts developed since grade school; how curvy is your body compared to grade school; how developed are you compared to others your age	High physical maturity = 1 Low physical maturity = 0 The physical maturity items were standardized and used to create separate additive scales for males and females, and then recombined to form a single physical maturity scale. Respondents who scored in the 50^{th} percentile or higher were coded as high physical maturity and all others as low physical maturity
Socioeconomic status	Captures respondent's relative social class standing based on parents' responses to two items: level of education and occupation	Standardized mean of respondent's parents' education and parents' occupational prestige

Table 2 cont.

Measure	Definition	Calculation
Depression	Measure of respondent's depression based on 24 items commonly associated with depression: how often experience insomnia; have trouble relaxing; how often moody; how often cry; how often bothered by things; how often have poor appetite; frequency had the blues; feel just as good as others; felt depressed; felt too tired to do things; had trouble keeping mind focused; felt too tired to do things; felt hopeful about the future (reverse coded); felt that life had been a failure; how often felt fearful; how often felt happy (reverse coded); talked less than usual; felt lonely; how often people were mean to you; felt sad; felt that people disliked you; how often found it hard to start doing things; how often felt that life was not worth living	Standardized mean of respondent's depression
Alcohol use	Measure of respondent's use of alcohol	Respondents grouped into 4 categories: No use (reference group) no reported alcohol use during either year of the study New user coded "1" if respondent reported using alcohol only during the second year of the study, else coded "0" Stopped using coded "1" if respondent reported using alcohol only during the first year of the study Consistent user coded "1" if respondent reported using alcohol during both years of the study

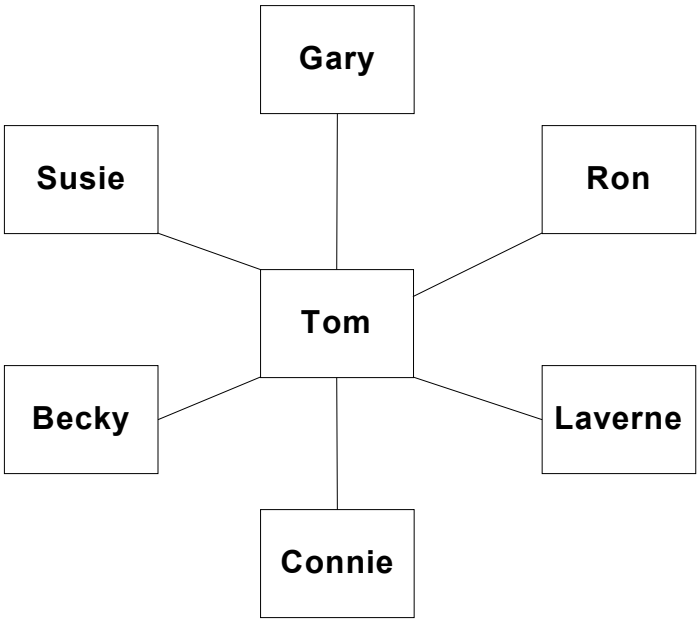
Table 2 cont.

Measure	Definition	Calculation
Drug use	Measure of respondent's illegal substance use based on 4 items: marijuana use; cocaine use; inhalants use; other drug use (LSD, PCP, ecstasy; ice; heroin, mushrooms, speed, or pills without doctor's prescription)	Respondents grouped into 4 categories: No use (reference group) no reported drug use during either year of the study New user coded "1" if respondent reported using drugs only during the second year of the study, else coded "0" Stopped using coded "1" if respondent reported using drugs only during the first year of the study Consistent user coded "1" if respondent reported using drugs during both years of the study
Sell drugs	Dummy variable indicating whether respondent reported selling marijuana or other illegal substances	Sells drugs = 1 No drug sales = 0
School-level Measures		
School network density	Number of ties present in school-level network divided by the number of possible ties in the total network, corrected for the maximum number of friends a respondent can nominate	D = (Σ X / g(g-1)) / (abs(10*g)/(g(g-1)), where X = number of actual ties in school-level network
Mean violent victimization	Mean value of violent victimization items for all students in a school	Mean offending = $\Sigma x_{ji} / n_g$,where x_{ji} = the relative frequency of violent victimization for the j^{th} student in the school i and n_{gi} = the number of students enrolled in school i
Mean violent offending	Mean value of violent offending items for all students in a school	Mean offending = $\Sigma x_{ji} / n_g$,where x_{ji} = the relative frequency of violent offending for the j^{th} student in school i and n_{gi} = the number of students enrolled in school i

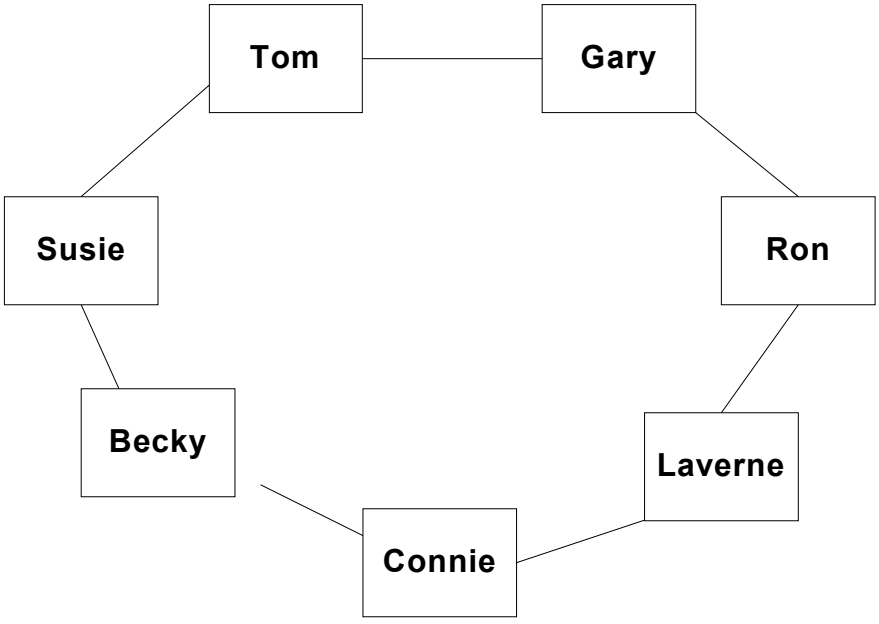
Table 2 cont.

Measure	Definition	Calculation
Proportion two parent families	Proportion of students in a school living with two parents during both years of the study	Proportion two parent families = $\Sigma(x_{ji})/ n_g$,where x_{ji} = 1 when the j^{th} student in the school i lives with two parents and n_{gi} = the number of students enrolled in school i
Mean level of socializing with peers	Mean value of socializing with peers (see above) for all students in a school	Mean socializing = $\Sigma x_{ji} / n_g$,where x_{ji} = the amount of socializing with peers for the j^{th} student in the school i and n_{gi} = the number of students enrolled in school i
School size	Measures the size of the student body	Size = number of students enrolled in a school
Urban school	Dummy variable indicating whether the school is located in a rural or urban area	Urban = 1 Rural = 0
School type	Dummy variable indicating whether the school is public or private	Public = 1 Private = 0
School supervision	Ratio of students to teachers in a school	Supervision = number of students enrolled in a school / number of school faculty and staff
Mean level of hostile school climate	Mean value of hostile school climate for all students in a school	Mean socializing = $\Sigma x_{ji} / n_g$,where x_{ji} = the value of hostile school climate for the j^{th} student in the school i and n_{gi} = the number of students enrolled in school i

Figure 1. Illustration of Network Centrality



Peer group A: star pattern network



Peer group B: circle pattern network

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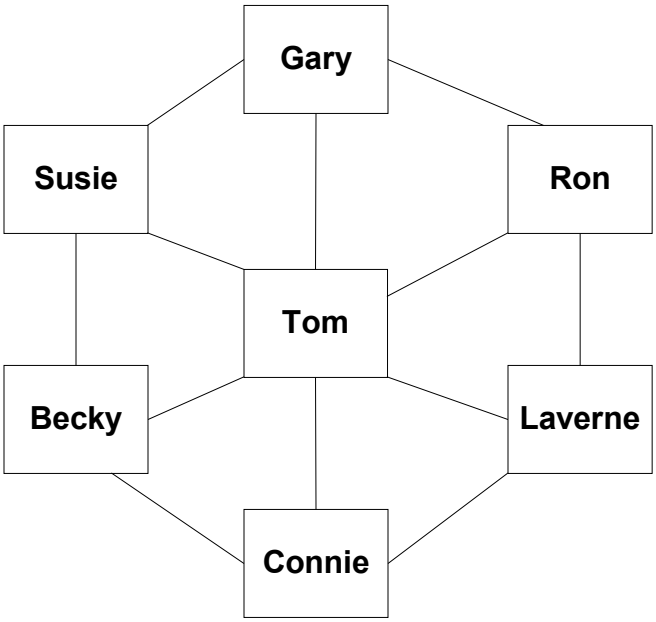
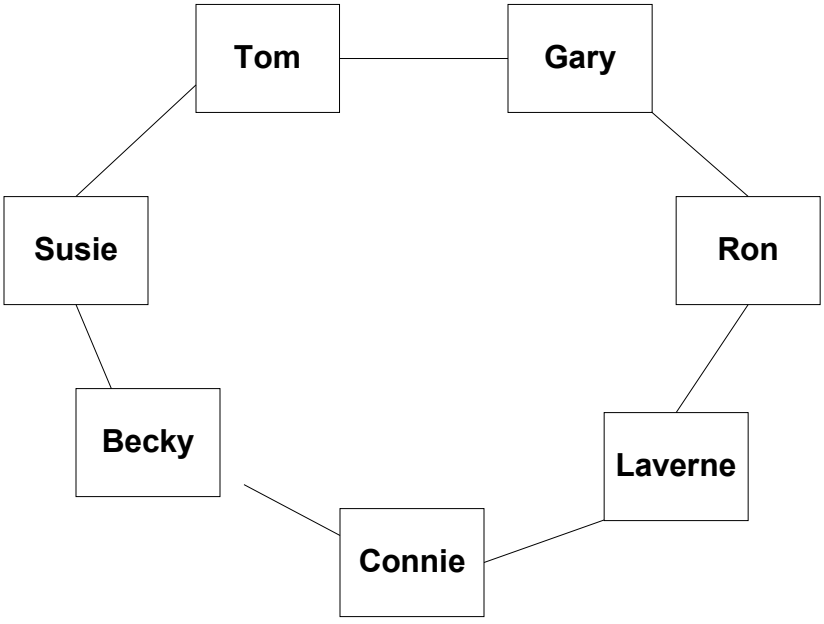
Figure 2. Illustration of Network Density



Peer group A: higher density network



Peer group B: lower density network

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Chapter 2
Data and Measures

Data

This research uses data from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health). The Add Health study is a longitudinal study of a nationally representative sample of 90,118 juveniles in grades seven through twelve nested within 132 U.S. schools. The Add Health study, which the Carolina Population Center at the University of North Carolina at Chapel Hill administers, used a clustered sampling design based on a stratified sample of 80 high schools and 52 paired middle schools. The longitudinal portion of the Add Health data includes 13,570 adolescents.

These data offer three advantages over previous data sets used to examine the victim-offender overlap. First, because the data are longitudinal, it is possible to establish the relative timing of adolescents' victimizations and offenses and to attempt to replicate Lauritsen et al.'s (Lauritsen et al. 1991) finding that the relationship between victimization and offending is reciprocal. Having two-years of data makes it possible to conduct more sophisticated analysis of the victim-offender overlap than has been possible with the cross-sectional designs of most previous research.

Second, the Add Health data include information about a number of contexts of adolescents' lives: school, peer group, and home. Consequently, these data make it possible to isolate the independent effects of victimization and offending on one another, net of the potentially confounding effects of social networks, routine activities, school

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context, and a number of other factors related to adolescents' risk of both victimization and offending.

Finally, the Add Health data are not subject to the same-source bias for measuring peer delinquency inherent in most other data set. As described in chapter 1, adolescents tend to overestimate the similarity between themselves and their peers, and the same-source bias present in these reports produces inflated estimates of the effect of peer association on adolescents' own offending. Relatedly, the data include objective indicators of adolescents' school contexts. The ability to objectively assess the offending and victimization experiences of adolescents' peers and adolescents' social contexts is a marked advantage over previous research.

This chapter begins with a description of the three different data components used in the current study- 1) in-school interviews, 2) in-home interviews, and 3) school administrator interviews. Next, I describe the central dependent and independent measures in the analysis. Table 2 presents a complete description of the variables used in the analyses. The chapter concludes with a discussion of the analytic plan.

In-School Surveys[7]

The Add Health study includes one wave of in-school surveys, which respondents completed in 1995. Schools were sampled for inclusion into the study from a national sampling frame of 26,666 high schools, stratified by size, school type (i.e., public or

[7] Information about the research design in these sections is from Bearman et al. (1997).

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private), census region, level of urbanization, percent white, and state. Next, 80 high schools and the 52 middle schools that sent students to those high schools were sampled.

Although there were a few exceptions, the Add Health study used passive parental consent forms. That is, survey administrators assumed parental consent for student participation unless students returned a form indicating that their parents objected to their participation. Within each school, every student who attended school on the day of data collection, and who had parental consent to participate, completed self-administered scantron surveys during a regular class session, which took approximately 45 minutes to complete. Across all schools, 90,118 students completed the survey.

In-Home Interviews

A sub-sample of respondents in grades seven through twelve from the in-school sample, stratified by grade and gender, was selected from the school rosters for two waves of in-home interviews. The in-home interviews were conducted between April and December of 1995 (wave 1) and again between April and August of 1996 (wave 2). All students whose names were included on the school rosters were eligible for inclusion in the in-home phase of the study, regardless of whether they completed the in-school survey. A total of 20,745 adolescents participated in wave 1 of the in-home interviews (response rate = 78.9%) and 14,738 participated in wave 2 (response rate = 88.2% of those who participated in wave 1 intereviews).

Respondents typically completed the in-home interviews, which lasted between

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one and two hours, in their homes. Trained interviewers read less sensitive questions (e.g., nutrition, family composition, and employment experience) and recorded responses on laptop computers. For more sensitive questions (e.g., about criminal activities, substance use, and sexual partnerships), adolescents listened to a pre-recorded tape and entered their responses into the laptop themselves.

Because, the in-home interviews included a number of detailed questions asking respondents about violent victimization, substance use, and criminal activities, they are the primary focus of the current study. Moreover, because the Add Health study was particularly interested in adolescents' social networks, a special saturation sample of 16 schools was selected for inclusion in the in-home interviews. That is, all of the students enrolled in 16 of the study schools were sampled for the in-home interviews and asked to provide information about their involvement in crime as victims and offenders and to provide information about their friends. Consequently, this portion of the Add Health sample, the saturation sample (n = 3,702), allows for the most complete analysis of the victim-offender overlap and composes the sample for this research. Of the 3,702 adolescents' included in the saturation sample, 2,728 (74%) participated in both waves of the Add Health study.

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Social Network Data[8]

The in-home surveys collected information about respondents' peer networks. Participants were asked to nominate their five best female and five best male friends from a roster of all students enrolled in their school. In some instances, students nominated friends whose names did not appear on the school roster (e.g., the roster was incomplete or contained other errors). Students were then asked to indicate whether the friend (a) attended the school but was not listed on the roster, (b) attended the feeder school, or (c) did attend either the respondent's school or the feeder school. Thirteen percent of all friendship nominations could not be matched to another respondent in the study; approximately 15% of these were unmatched because the nominated friend attended a school not included in the study, and approximately 8% were unmatched because the friend's name was not included on the rosters.

School Administrator Questionnaires

In addition to the information collected from adolescents and their parents, the Add Health study also collected two waves of data about the respondents' schools. School administrators provided this data using self-administered scantron surveys during wave 1 and through telephone interviews during wave 2. The data from the school administrator questionnaires provide information about the schools' curriculum, student body characteristics, policies, teacher characteristics, and programs. Overall, 164 school

[8] Information about the design of the social network component of the study is from Jones (1997)

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administrators completed questionnaires during wave 1 and 125 completed questionnaires during wave 2.

Key Measures and Analytic Plan

In this section, I describe the key dependent and independent variables. Table 2 provides a complete description of all the variables included in this study.

Dependent Variables

The dependent variables in the current study are based on adolescents' self-reports about their involvement in crime as both victims and offenders. Although some have questioned the utility of self-report data (e.g., Reiss, 1975), there is strong evidence suggesting that adolescents do report their involvement in crime and that these reports generally correlate with official measures of crime and are valid and reliable (Hindelang et al. 1981).

The measure of violent offending comprises 5 items that asked adolescents to report how often during the previous 12 months they committed the following serious physical offenses against other persons: hurt someone badly enough to require medical attention, were in a serious physical fight, used or threatened to use a weapon to get something from someone, shot or stabbed someone, and pulled a knife or gun on someone. I measure adolescents' involvement in crime as victims using four items that asked respondents to indicate how often during the previous 12 months they experienced the following serious physical victimizations: someone pulled a knife or gun on them,

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they were shot, they were cut or stabbed, they were jumped.

The original responses to both the victimization and offending items ranged from 0 (never) to 2 (more than once). I recoded each of these items into dummy variables, coded "1" for respondents who reported the event and "0" for those who did not. I then used these recoded items to construct two measures of adolescents' involvement in crime as offenders and as victims: dichotomous indices (reflecting any involvement) and additive indices (reflecting a count of different types of criminal involvement, or a variety index).

In addition to these four primary outcome variables, I also separated adolescents into four groups: those who were victims only, those who were offenders only, those who were both victims and offenders, and those who were neither victims nor offenders. Adolescents who reported being victimized at least once during either year of the study and who reported no involvement in crime as an offender during either year of the study were classified as "victims only." Adolescents who reported committing at least one offense during either year of the study and who reported no victimization during either year of the study were classified as "offenders only." Adolescents who reported committing at least one offense during either year of the study and who reported at least one victimization during either year of the study were classified as "overlap members." Adolescents who reported no involvement in crime as either a victim or an offender during both years of the study were classified as "no crime."

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Independent Variables

Social Network Measures

I use the full social network data available in the Add Health data to assess how peer groups influence adolescents' involvement in crime as victims and offenders. This dissertation considers four factors relating to peer group criminal involvement and eight local peer group (i.e., egocentric network) variables. I define adolescents' peer groups as send and receive networks (i.e., those adolescents respondents nominated as friends and those adolescents who nominated the respondent as a friend). Three alternative operationalizations of adolescents' local peer networks are possible with the Add Health data: send networks (i.e., only those adolescents the respondent nominated as friends), receive networks (i.e., only those adolescents who nominated the respondent as a friend), and reciprocated networks (i.e., only those adolescents who nominate the respondent as a friend and who the respondent also nominates as a friend). However, these three measures do not take full advantage of all of the information available in the data and do not reflect the underlying "real world" complexity of friendship networks. Thus, I operationalize local peer networks as send-and-receive networks, because this measure generally provides the most complete understanding of how social networks influence individuals' behavior.

Peers' involvement in crime is assessed using four measures: proportion of peers who are offenders, proportion of peers who are victims, mean peer group offending, and mean peer group victimization. To measure the proportion of delinquent peers, peers

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were coded as an offender if they reported committing any of the five offenses described above and as a victim if they reported experiencing any of the four victimizations described above. The mean level of peer groups' offending and victimization measures were created in three steps using the original coding (0- never, 1- once, 2- more than once) of the crime items described above. First, for each adolescent, I created an additive offending index using each of the five offending items and an additive victimization index using each of the four victimization items. Second, I summed the indices across all adolescents in a respondent's peer group, and then, finally, divided by the number of adolescents (excluding the respondent) in the peer groups. I expected that all four measures of peer group involvement in crime would be positively associated with adolescents' own offending and victimization.

In addition to peer group members' involvement in crime as victims and offenders, I also considered seven network measures: peer network size, in-degree, out-degree, density, closeness, status prestige, and Bonacich power centrality. The first measure, size of the peer group, simply reflects the number of others in an adolescent's peer group. The second network measure, isolate, is a dichotomous measure coded "1" for respondents who have no friendship ties to other adolescents in their school. As noted in the previous chapter, peer group size influences adolescents' involvement in crime as victims and as offenders by exposing them to potential offenders and targets for victimization, by increasing or decreasing their level of guardianship, and by differentially providing access to information about criminal opportunities and potential threats.

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Adolescents who are isolates are less likely than adolescents with friends to offend because they have few, if any, opportunities for unstructured socializing with peers, less access to information about potential targets, and fewer resources to make committing an offense easier. Isolates are at increased risk of victimization because they have fewer potential guardians and because their isolation probably indicates that other adolescents have "rejected" them (Hodges & Perry 1999). In terms of the victim offender overlap, adolescent victims who are isolates are at increased risk for offending because they lack friends who can provide support following the victimization (Hodges & Perry 1999). The third and fourth peer network factors, in-degree and out-degree, were examined in the bivariate analyses and were used to construct more sophisticated network measures. In-degree is simply a count of the adolescents who nominated the respondent as a friend and is a crude measure of adolescents' popularity. Out-degree is simply a count of adolescents the respondent nominated as friends and is a crude measure of adolescents' influence in the peer group.

The fifth measure of peer networks, density, is the number of friendship ties actually present in the local peer network divided by the number of possible ties in the network. As noted in the previous chapter, density is a simple measure of peer group cohesion that is sensitive to the type of relational tie under consideration (e.g., friendship versus marital ties). Because density is sensitive to social factors, I expected that the influence of peer group density is dependent on the criminal involvement of peer group members.

That is, I expected that members of relatively dense peer groups would be at

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increased risk of both victimization and offending when the peer group members were also relatively delinquent. With respect to dense peer groups with relatively high rates of victimization, I expected that members of peer groups with these characteristics would be at an increased risk of victimization because this signals to potential offenders that an adolescent and his or her friends will not be able to effectively guard against potential threats. Further, I expected that members of dense peer groups that have relatively high rates of victimization would be at increased for offending because members of these peer groups are especially motivated to retaliate against their offenders.

Sixth, this dissertation considered how closeness, the social distance between a given adolescent and other peer group members, influences adolescent victimization and offending. I constructed the closeness measure by dividing the number of adolescents in a respondent's peer group by the sum of the number of paths (i.e., friendship ties) between the respondent and each member of his or her peer group. As noted in the previous chapter, closeness is an indicator of how efficiently adolescents can disseminate and extract resources and information from their peer group.

Compared to adolescents with relatively low closeness, adolescents with higher closeness are at an increased risk for offending because they can more easily extract information about offending opportunities, can more easily mobilize peers to help them offend, and are better able to efficiently disseminate information about their offending, which may enhance their social status in the peer group. There are two reasonable hypotheses about what effect closeness has on adolescents' risk of victimization. First, adolescents with greater closeness may enjoy a lower risk of victimization because they

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are better able to learn of threats against them and to mobilize their peers to help protect them. Alternatively, as adolescents' closeness to other peer group members increases, their risk of victimization might also increase because more potential offenders are likely to have information about these adolescents (e.g., to learn of any offensive behavior). However, because most factors that affect offending similarly affect victimization, I expected that closeness would be positively related to adolescents' risk of victimization.

The seventh peer network measure, status prestige, is an indicator of adolescents' rank or popularity. This indicator of adolescent popularity is preferable to the simpler measure of in-degree because it weights the number of others who nominate the adolescent as a friend (simple in-degree) by the in-degree of those others. That is, an adolescent's own popularity is in part a function of the popularity of his or her friends. Combining both of these aspects, adolescents' in-degree and the in-degree of adolescents who claim them as friends, is important for capturing the real world complexity of social networks.

For example, consider two adolescents, Judy and Rita. Both Judy and Rita have an in-degree of 6, meaning that 6 others claim them as friends. Consider further that, whereas another 6 adolescents nominated each of Judy's friends as a friend, no other adolescents nominated any of Rita's friends as friends. Thus, whereas Judy's popularity and influence extend beyond her immediate friendships, Rita's popularity and influence are restricted to a much smaller group of adolescents.

The final peer network measure the current study incorporates is Bonacich power centrality (centrality). This measure captures the in- and out-degree of both the

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respondent and of other peer group members to whom the respondent is connected (see table 2 for details about how this measure is constructed). Generally, the greater an adolescent's centrality, the greater is his or her capacity to direct the behavior of other peer group members and the more susceptible he or she is to the influence of others (Hanneman 2002). Compared to adolescents located in the periphery of the peer group, central adolescents are more "active" within the peer group (Wasserman & Faust 1994) and therefore have greater exposure to the normative behaviors and expectations of the group. Thus, I expected that the effect of centrality on adolescents' criminal involvement would depend on the victimization and offending of their peer group members.

Central adolescents in peer groups with relatively high levels of delinquency are at an increased risk for offending because they are exposed to others who model delinquent behavior. Similarly, central adolescents in peer groups with relatively high levels of victimization were expected to be at an increased risk for victimization because they are exposed to peers who model behaviors that lead to victimization (e.g., showing off desirable property or a timid, unconfident body demeanor).

Routine Activities

In addition to focusing on how adolescents' social networks influence their opportunities for criminal involvement, the current research examined how adolescents' routine activities affect the relationship between victimization and offending. In particular, I focused on one variable that reflects adolescents' unstructured socializing with peers in the absence of authority figures, the central concept in individual-level

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routine activity theory. Although the use of a single indicator of adolescents' routine activities provides only a one dimensional view of the larger theoretical perspective, this variable is a robust predictor of adolescents' offending and also captures a central dynamic in peer groups- how frequently members spend time together.

The measure of adolescent routine activities, socializing with peers, reflects the mean amount of time adolescents spend in unstructured socializing with the peers they nominated as friends. For each adolescent the respondent nominated as a friend (up to 5 males and 5 females), the respondent also reported whether, over the past week, he or she spent time at the friend's home, spent time with the friend over the weekend, and met the friend after school to "hang out." For each respondent, I summed their responses (0- spent no time this way or 1- spent time this way) to these three items for each nominated friend, and then divided by the number of friends the respondent nominated. I expected that adolescents who spend more time in unstructured socializing with peers would be at increased risk for both victimization and offending.

Prior research on the victim-offender overlap has typically conceptualized offending and substance use to be different indicators of the same underlying construct, involvement in delinquent or deviant lifestyles (see table 1). However, as noted in the previous chapter, this interpretation is not compatible with the routine activity perspective guiding the current research. Thus, the current study conceptualized offending as a *product* of adolescent routine activities, which differentially expose adolescents to opportunities for offending and, thus, did not combine adolescent offending and substance use into a single indicator of delinquent lifestyles.

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Nevertheless, I included controls for adolescent substance use because prior research on the victim-offender overlap indicates that drinking and drug use significantly predict victimization and offending, even after controlling for other important predictors of adolescent criminal involvement. In addition, this dissertation considered an extensive list of control variables that prior research on the victim-offender overlap indicates are associated with adolescent victimization and offending. These control variables included factors related to the family (e.g., family structure and parental supervision), the school (hostile school climate and school attachment), and sociodemographic factors about the adolescent (e.g., age and gender). Table 2 provides the details about the measurement of all of the variables included in the analyses.

School Context

The current study incorporated measures of school context to examine how social context influences the relationships between victimization and offending. I measured school context using data about the network of associations among all of the students in a school, information school administrators provided about their schools, and the aggregation of information about the behavior and attitudes of all students in a school. These variables included the mean school victimization and offending rates, student-teacher ratio, whether the school is public or private, the size of the school, and proportion of students living in two parent families. Detailed information about these school-level variables is provided in table 2.

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Data Limitations

Although the Add Health data are well suited to testing the current study's hypotheses, it is important to review five limitations of these data. The first problem with these data concerns the intervals between the first and the second interview. Although many of the survey items of interest to this dissertation, including questions asking about involvement in crime, asked the adolescent respondents to provide information about the "previous 12 months," only 30% of the adolescents in the saturation sample had at least 12 months between interviews. Consequently, for the remainder of the sample, events captured during the second interview might have occurred before and been captured during the first interview. If so, then the temporal ordering of the data, and thus the validity of the statistical findings, are compromised.

Although the mean number of months between the first and second interviews is 11, the interval ranges between 4.4 months and 15.3 months. Fortunately, very few cases fall toward the lower end of this range. Less than 5% of the sample have fewer than eight months between interviews, with 87% having at least 9 months, 76% having at least 10 months, and 56% having at least 11 months between interviews. I took two steps to assess and limit the potential impact of having fewer than 12 months between interviews on the results reported here.

First, I compared adolescents having less than a 12-month interval between interviews with adolescents having at least a 12-month interval in terms of several socio-demographic characteristics (e.g., gender, age, and family structure) and in terms of their

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involvement in crime as victims and offenders. The results (not shown) indicated that the two groups were not significantly different from one another. Importantly, the two groups did not differ in their incidence and prevalence of victimization or offending and there was no difference between the groups in terms of membership in the victim-offender overlap. Second, all of the multivariate analyses included a binary control variable (with those having fewer than 12 months between interviews serving as the reference group) to limit the potential impact of having fewer than 12 months between interviews.[9]

The second limitation of the Add Health data also concerns the study's recall periods. The prevalence of many events, including victimization and offending, was greater in the first year of the study than in the second (Shaffer & Ruback 2002). The decline in reporting events that occurred across waves is probably the result of "telescoping," which occurs when a respondent inaccurately recalls the timing of an event (Singleton et al. 1993: 304; Sudman & Bradburn 1986).

Telescoping is probably less of a problem in the second year of data, because the first interview "bounded" the recall period for the second interview. That is, during the second interview, interviewers reminded adolescents of the first interview and many of the questions in the second survey asked adolescents to report events that occurred "since the month of the last interview." Analyses of the National Crime Victimization Survey indicate that victimization rates are higher for unbounded interviews (i.e., there were no

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[9] Additionally, I ran separate analyses controlling for whether adolescents had at least (1) 10 months between interviews and (2) 11 months between interviews. The results of these analyses do not differ substantively from the results based on the models controlling for whether adolescents had 12 months between interviews reported here.

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previous interviews) than for bounded interviews (i.e., there was an interview six months prior) (Murphy & Cowan 1982).

The third limitation of the Add Health data concerns the practical restrictions on the social network data. As noted above, each adolescent could nominate no more than ten friends (five male and five female). Although limiting the number of nominations respondents can make is a typical design strategy for social network research (Wasserman & Faust 1994), it is not clear how the number of friendship nominations might have differed if adolescents could have made an unlimited number of nominations. Still, this restriction does not seem to have affected most of the Add Health study participants. The mean number of friendship nominations was 5.1 during the first year of the study and 4.2 during the second year. Another possible problem with the social network restrictions concerns the fact that friendship nominations were limited to students enrolled in the same school. However, another school-based social network study that did not restrict respondents' friendship nominations to students enrolled in the same school found that 95% of respondents' friendship nominations were to adolescents enrolled in the same school as the respondent (Ennett & Bauman 1994).

Concerns about confidentiality led to the fourth limitation of the Add Health social network data. Because much of the information the Add Health study collected from adolescents is highly sensitive (e.g., detailed sexual experiences, criminal involvement, substance use), the Carolina Population Center has imposed tight restrictions on access to these data. The identity of peers whom adolescents also nominated as a sexual or intimate partner is available only at the Carolina Population

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Center.[10] This limitation affected only 453 (2.3%) nominations in the first year of data and only 365 (2.4%) in the second. For this small proportion of nominations, it was not possible to directly link respondents with those adolescents they nominated as friends.

The fifth limitation of these data concerns the lack of detailed information about where the reported victimization and offending events occurred and about the relationship between the victim and offender involved in these events. Specifically, although it possible to determine that a respondent was victimized or committed an offense, it is not possible to establish whether the event occurred at school, in the respondent's neighborhood, or somewhere else. Moreover, the Add Health data do not include information about whether adolescents committed crimes against strangers, members of their peer group, or other acquaintances. Similarly, it is not possible to establish whether strangers, peer group members, or other acquaintances, victimized adolescents. Thus, I was not able to directly test hypotheses about crimes in which the victim and offender were members of the same peer group.

Analytic Plan

The next three chapters present the findings from the current study. Chapter 3 begins with a descriptive account of the sample and of the extent of the victim-offender overlap among adolescents. In this stage of the analyses, I compared the individual-level differences between four groups of adolescents; those who were victims only, those who

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[10] That is, researchers must travel to Chapel Hill to model data including the identities of romantic partners. This is the only component of the Add Health data that is not available through Penn State's Population Research Institute.

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were offenders only, those who were both victims and offenders, and those who are neither victims nor offenders. I also compared the summary network measures of these four groups to determine whether these adolescents are more or less integrated into their peer groups and how the structure of their peer groups differs. Because very little is known about how peer networks vary by adolescents' status as a victim and as part of the victim-offender overlap, I placed a special emphasis on these comparisons.

The multivariate analyses begin in Chapter 4, in which I present the results from a series of cross-lagged logistic regression models using offending and victimization during the first year of the study to predict offending and victimization during the second year.[11] In this stage of the analyses, I also examined whether the relationship between victimization and offending is reciprocal using the General Methods of Moments technique, which is appropriate for instrumental variable analyses using dichotomous outcome variables (Foster & McLanahan 1996; Greene 2002).

Chapter 5 presents the results from a series of bi-variate probit models used to estimate the joint probability of victimization and offending. Specifically, the focus in this chapter is on establishing whether victimization and offending are different outcomes of a similar social process or whether the association between the two is simply a spurious result of other factors related to both. I also use the results from these models to explore how individual and peer group characteristics influence the likelihood of being part of the victim-offender overlap (i.e., being both a victim and an offender).

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[11] Details about the various statistical techniques used in the analyses are provided in the chapters in which the results of the analyses are presented.

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The multivariate analyses conclude in chapter 5, which also presents the results from multi-level logistic regression models that examine how school-level variables influence the relationships among victimization, offending, and local peer networks. These multi-level models incorporated the individual-level variables that the prior analyses indicated are important for understanding the relationship between victimization and offending and for predicting whether adolescents will be part of the victim-offender overlap.

Because of the Add Health's complex sampling strategy (see above), to produce unbiased parameter estimates and significance tests, I used statistical models that correct for the clustering of the data and the correlated error structure (Chantala & Tabor 1999). The General Methods of Moments analyses are the exception. Although these models were able to correct for the correlated error between victimization and offending, they did not adjust for the within-school error correlation.

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Chapter 3

Adolescent Criminal Involvement

In this chapter, I describe the sample selection criteria and the final sample I used in the analyses and address -three questions: 1) What is the extent of adolescents' involvement in crime as victims, offenders, and as part of the victim-offender overlap?; 2) How are victimization and offending related within and across years?; and 3) How do adolescents who are part of the victim-offender overlap differ from those who are not involved in crime as either victims or offenders, who are victims only, and who are offenders only? Because we know very little about how peer groups influence risk of victimization and being part of the victim-offender overlap, I place a special emphasis on understanding the association between peer networks and adolescents' criminal involvement as victims, as offenders, and as part of the part of the victim-offender overlap.

Sample Selection and Descriptive Statistics

Adolescents were eligible for inclusion in the analyses if they met all four of the conditions listed below.

a. Were part of the special saturation sample (3,702 adolescents in 16 schools)

b. Participated in both years of the in-home survey (n = 2,728)

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c. Were asked to provide complete information on their friendship networks (2,676 adolescents in 15 schools)[12]

d. Provided information on all of the variables included in the analyses (n = 2,000)

Tables 3a and 3b provide the descriptive characteristics of the final sample of 2,000 adolescents on the variables examined in this dissertation. Table 3a presents the descriptive statistics for the sample during Year 1. Table 3b presents the descriptive statistics for the sample during Year 2. Stable characteristics (i.e., sex and race) and those variables that were measured at Year 1 only (e.g., adolescents' positions within their friendship networks) are presented in Table 3a only; measures constructed using data from both Year 1 and Year 2 (e.g., crime group) are presented in Table 3b only.

As shown in there, although the mean frequencies of offending and victimization were relatively low for both individual adolescents and for peer groups (averaging less than one criminal event), there was considerable variation around these means. As shown in Table 3b, more than half (54%) of all adolescents were not involved in crime as either a victim or an offender at any time during the study period. Although very few adolescents reported involvement in crime as victims only (6%), 22% reported involvement in crime as offenders only and 18% reported involvement in crime as both a victim and an offender (i.e., part of the victim-offender overlap).

Looking at Table 3a, the average adolescent had a direct connection to eight friends, occupied a relatively peripheral position in a loosely connected network, and spent a considerable amount of time interacting with his or her friends. In terms of

[12] Adolescents in one of the schools included in the saturation sample were not asked to provide information about their friendship networks.

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Table 3a. Descriptive Statistics for Sample Wave 1 (n =2000 adolescents and 15 schools)

Variable	Percent	Mean	Std. Dev.	Min.	Max.	Scale alpha
Victimization and Offending						
Offender						
Yes	34					
No (reference group)	66					
Victim						
Yes	19					
No (reference group)	80					
Crime Group						
No crime	60					
Victim only	6					
Offender only	20					
Part of overlap	14					
Relative frequency:						
Offending		0.79	0.04	0	10	0.78
Victimization		0.34	0.02	0	8	0.66
Peer and Network Characteristics						
Socializing with peers		7.14	0.13	0	29	0.84
Mean network offending		0.88	0.02	0	7	
Mean network victimization		0.40	0.01	0	6	
Proportion of network members who are offenders		0.34	0.01	0	1	
Proportion of network members who are victims		0.19	0.01	0	1	
Network size		8.10	0.09	2	21	
In-degree		3.96	0.07	0	17	
Out-degree		4.15	0.07	0	10	
Density		0.18	0.01	0	1	
Closeness		1.84	0.08	0.06	30.65	
Bonacich Centrality		0.80	0.70	0	3.57	
Status prestige		0.77	0.71	0	5.15	
Individual Characteristics						
Sex						
Male	49					
Female (reference group)	51					
White (reference group)	56					
Other	44					
Black	13					
Asian	15					
Native American	1					
Other	15					

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Table 3a. (Cont'd)

Variable	Percent	Mean	Std. Dev.	Min.	Max.	Scale alpha
Live with two parents	74					
High physical maturity	54					
Males						0.63
Females						0.66
Drink alcohol	41					
Use drugs	31					
Sell drugs	7					
Age		16.00	1.43	12	20	
Socio-economic status		0.10	0.02	-1.97	1.94	0.79
Social support		4.00	0.03	1.57	5.00	0.65
Parental supervision		0.08	0.01	-1.87	1.06	0.61
Communication with parents		0.10	0.01	-1.83	1.21	0.75
Relationship with parents		0.11	0.02	-2.18	0.82	0.78
Hostile school climate		1.79	0.02	0	4.25	0.57
School attachment		2.14	0.02	0	5.00	0.79
Depression		0.01	0.01	-0.80	2.95	0.88
Self-esteem		-0.04	0.02	-3.13	1.13	0.84
Grade point average		2.77	0.02	0	4.00	0.76
School Characteristics						
School type						
Public school	67					
Private school (reference group)	33					
School location						
Urban school location	27					
Suburban school location	40					
Rural school location (reference group)	33					
School network density						
Mean offending		0.77	0.30	0.28	1.35	
Mean victimization		0.26	0.14	0.00	0.47	
Proportion two parent families		0.70	0.15	0.38	0.95	
Proportion Caucasian students		0.74	0.36	0.02	1.00	
Mean socializing with peers						
School size (student enrollment)		121 (Median)		26.00	2104.0 0	
Student-teacher ratio						
Mean hostile school climate		1.72	0.15	1.48	1.96	

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Table 3b. Descriptive Statistics for Sample Wave 2 (n =2000 adolescents and 15 schools)

Variable	Percent	Mean	Std. Dev.	Min.	Max.	Scale alpha
Victimization and Offending						
Offender						
Yes	20					
No (reference group)	80					
Victim	15					
Yes	85					
No (reference group)						
Crime Group						
No crime	74					
Victim only	6					
Offender only	11					
Part of overlap	9					
Relative frequency:						
Offending						0.78
Victimization						0.75
Peer and Network Characteristics						
Socializing with peers		0.41	0.08	-1.00	4.14	0.83
Individual Characteristics						
Live with two parents	74					
High physical maturity	54					
Drink alcohol	37					
Use drugs	27					
Sell drugs	7					
Age		17	0.03	13	21	
Social support		4.00	0.01	0	5	0.70
Parental supervision		0.04	0.01	-1.79	1.07	0.69
Communication with parents		0.07	0.01	-1.81	1.17	0.79
Relationship with parents		0.06	0.02	-2.18	0.87	0.83
Hostile school climate		1.47	0.02	0	4	0.55
School attachment		2.15	0.02	0	5	0.86
Depression		0.01	0.01	-0.82	3.27	0.88
Self-esteem		-0.04	0.02	-4.01	1.07	0.87
Grade point average		2.63	0.02	0	4	0.84

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Table 3b. (Cont'd)

Variable	Percent	Mean	Std. Dev.	Min.	Max.	Scale alpha
School Characteristics						
Mean offending		0.40	0.27	0	1.15	
Mean victimization		0.21	0.17	0	0.70	
Proportion two parent families		0.76	0.15	0.14	0.47	
Mean socializing with peers		0.31	0.33	-0.36	0.87	
Mean hostile school climate		1.47	0.17	1.16	1.68	
Combined measures of characteristics across waves						
Crime Group						
No crime	54					
Victim only	6					
Offender only	22					
Part of overlap either wave	18					
Part of overlap both waves	6					
Live with two parents	68					
Alcohol use						
No drinking (no drinking either wave)	47					
Stopped drinking (drink wave 1 only)	16					
Started drinking (drink wave 2 only)	11					
Consistent drinker (drink both waves)	26					
Substance use						
No drug use (no use either wave)	61					
Stopped using (use wave 1 only)	12					
Started using (use wave 2 only)	8					
Consistent user (use both waves)	19					

*Measures that did not change between waves are presented in Table 3a. only

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individual characteristics, the typical adolescent in the sample was 16 years old, was white, lived in a two parent family, did not use alcohol or drugs, had a relatively high level of social support, and did not perceive his or her school as a hostile place.

Prevalence of Victimization, Offending, and Being Part of the Victim-Offender Overlap

Table 4 describes the prevalence of offending, victimization, and both victimization and offending both within and across years of the study. As shown there, 34% of adolescents reported committing an offense in Year 1, 20% in Year 2, and 14% in both years. Nineteen percent reported being victimized in Year 1, 15% in Year 2, and 10% in both years. Fourteen percent of adolescents reported being part of the victim-offender overlap (i.e., both committing and being the victim of a violent crime) in Year 1, 9% in Year 2, and 6% in both years. As noted in the previous chapter, the percentages of juveniles reporting victimization and offending were greater during Year 1 than in Year 2. This decline is likely the result of telescoping, or the tendency of survey respondents to report events that occurred outside of the reference period about which they were asked to report (in the Add Health study, prior to Year 1).

Table 4. Prevalence of Victimization and Offending (n = 2000)

	Percentage of Adolescents Reporting		
Year	Offending	Victimization	Part of Overlap
Year 1	34	19	14
Year 2	20	15	9
Both Years	14	10	6

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As can be seen in Table 5, very few adolescents were part of peer groups that were homogenous with respect to members' criminal involvement. On average, adolescents reported having five friends who were not involved in crime as either victims or offenders, nearly three friends who were involved in crime as offenders, one friend who was involved in crime as a victim, and one friend who was both a victim and an offender.

Table 5. Distribution of criminal involvement in adolescent peer groups **(n = 2000)**

Number of peers who are:		
	Mean	**Min. – Max.**
Not involved in crime	5.14	0 – 21
Offenders	2.63	0 – 14
Offenders only	1.64	0 – 10
Victims	1.46	0 – 9
Victims only	0.46	0 – 5
Part of the overlap	1.00	0 – 9
Percentage of adolescents located in networks in which:		
	Percent	
No peers are involved in crime as either victims or offenders	11%	
All peers are involved in crime as either victims or offenders	5%	
There are no victims	33%	
All peers are victims	1%	
There are no offenders	16%	
All peers are offenders	3%	
No peers are part of the victim-offender overlap	46%	
All peers are part of the victim-offender overlap	0.30%	

Only 11% of adolescents were part of peer groups in which none of their friends was involved in crime as either victims or as offenders and even fewer, 5%, were located in peer groups in which all of their friends are involved in crime. Being part of a specialized peer group was particularly uncommon. Less than one-percent of adolescents

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were part of peer groups in which all members were part of the victim-offender overlap, only 1% of adolescents were located in victim-only peer groups, and only 3% of adolescents were located in offender-only peer groups.

Summary

Although the incidence of victimization and offending among the sample was low, 46% of adolescents reported either being victimized or committing an offense at least once during the study period. Moreover, 14% of adolescents reported experience as both a victim and as an offender. Thus, among adolescents with criminal involvement, 30% are part of the victim-offender overlap. The relatively high prevalence of experience as a victim, an offender, or both means that most adolescents will be part of a peer group where at least some of the members are involved in crime. In fact, the average peer group includes three adolescents who are involved in crime; and specialized peer groups, in which no or all members are involved in crime, are rare.

Bi-variate Analyses

Table 6 presents the results of the bi-variate analyses of the relationships between victimization and offending within years. The phi coefficient for the bi-variate relationship between victimization and offending during Year 1 is 0.37, suggesting only a moderate correlation between the two. However, as can be seen in Table 6, adolescents who committed an offense in Year 1 were 4.25 times more likely to report also being a victim during Year 1 than were non-offenders. Similarly, adolescents who were

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victimized during Year 1 were 2.58 times more likely to report also being an offender during Year 1 than were non-victims.

Table 6. Relationship Between Offending and Victimization Within Years (n = 2000)

Year 1		
Status in Year 1	Offending (%)	Victimization (%)
Offender	100	34*
Non-offender	0	8
Victim	67*	100
Non-victim	26	0
Phi Coefficient	0.37	
Year 2		
Status in Year 2	Offending (%)	Victimization (%)
Offender	100	41*
Non-offender	0	5
Victim	67*	100
Non-victim	14	0
Phi Coefficient	0.43	

*Difference between groups significant at $p < .01$

Consistent with the Year 1 relationships, the phi coefficient for the relationship between victimization and offending during Year 2, 0.43, suggests only a moderate correlation between the two. Despite this moderate correlation, the associated risks of a victimization or an offense are high. Adolescents who committed a violent offense during Year 2 were 8.2 times more likely to report also being a victim during Year 2 than were adolescents who did not commit a violent offense. Compared to non-victims, adolescents who were victimized during Year 2 were 10.6 times more likely to report also having committed a violent offense.

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The across-year bi-variate relationships between victimization and offending are presented in Table 7. As shown there, the strongest relationship is between victimization in Year 1 and victimization in Year 2. Compared to adolescents who reported no victimization during Year 1, Year 1 victims were 10.6 times more likely to also be victims during Year 2. Similarly, adolescents who committed an offense during Year 1 were 5.0 times more likely to commit an offense during Year 2 than were non-offenders. In terms of the victim-offender overlap, compared to non-offenders, adolescents who committed an offense during Year 1 were 4.3 times more likely to be victimized during Year 2. Compared to non-victims, adolescents who were victimized during Year 1 were 2.9 times more likely to commit an offense during Year 2.

Table 7. Relationship Between Victimization and Offending Across Years

	Year 2	
Status in Year 1	Offending (%)	Victimization (%)
Offender	45*	26*
Non-offender	9	6
Phi Coefficient	0.36	0.29
Victim	47*	53*
Non-victim	16	5
Phi Coefficient	0.30	0.50

*Difference between groups significant at $p < .01$

Table 8 presents the Pearson correlation coefficients for the associations between adolescents' peer group characteristics and their involvement in crime in Year 1 and Year 2. Overall, adolescents having a higher proportion of peers with any criminal experiences were significantly more likely to commit an offense in Year 1 or in Year 2, to be victimized in Year 1 or in Year 2, and to be part of the victim-offender overlap

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during any year than were adolescents with a lower proportion of these peers. Similarly, adolescents having a higher proportion of peers with no criminal involvement were significantly less likely to commit an offense in Year 1 or in Year 2, to be victimized in

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Table 8. Correlation coefficients between adolescent criminal involvement and peer group characteristics

Variable	Victim year 1	Victim year 2	Offender year 1	Offender year2	No crime year 1	No crime year2	Part of overlap wave 1	Part of overlap wave 2	Part of overlap any wave
Peers' criminal involvement									
Proportion of victims in peer group	0.14***	0.15***	0.14***	0.10***	-0.16***	-0.14***	0.13***	0.11***	0.15***
Proportion of offenders in peer group	0.15***	0.12***	0.23***	0.17***	-0.23***	-0.18***	0.16***	0.12***	0.18***
Proportion with no crime in peer group	-0.16***	-0.14***	-0.22***	-0.16***	0.23***	0.18***	-0.16***	-0.12***	-0.18***
Proportion overlap in peer group	0.15***	0.14***	0.16***	0.13***	-0.17***	-0.16***	0.14***	0.12***	0.16***
Peer group characteristics									
Peer group size	-0.09***	-0.09***	-0.07***	-0.03	0.09***	0.07**	-0.09***	-0.06**	-0.10***
In-degree	-0.10**	-0.06**	-0.04	-0.02	0.07**	0.05*	-0.03	-0.03	-0.04
Out-degree	-0.09***	-0.09***	-0.08***	-0.04	0.07**	0.06**	-0.11***	-0.07**	-0.11***
Density	-0.11***	-0.05*	-0.07***	-0.02	0.09***	0.04	-0.09***	-0.04	-0.08***
Centrality	-0.10***	-0.11***	-0.09***	-0.05*	0.09***	0.08***	-0.12***	-0.08**	-0.12***
Closeness	-0.09***	-0.07**	-0.02	-0.002	0.05*	0.03	-0.07*	-0.05	-0.07**
Status prestige	-0.07**	-0.08**	-0.05*	-0.02	0.08***	0.06**	-0.04	-0.04	-0.07**

Note: Peer group characteristics are measured at year 1

* $p < .05$, ** $p < .01$, *** $p < .001$

Year 1 or in Year 2, and to be part of the victim-offender overlap during any year than were adolescents with a lower proportion of these peers.

The size of adolescents' peer groups is significantly related to their criminal involvement. As the size of their peer groups increased, adolescents were significantly less likely to be victims in Year 1 or in Year 2, to be offenders in Year 1, and to be part of the victim-offender overlap during any year, and they were significantly more likely to report no criminal involvement during Year 1 or Year 2. Measuring peer group size as in-degree (the number of peers who nominate an adolescent as a friend) or as out-degree (the number of peers an adolescent nominates as a friend) produced similar results.

In terms of adolescents' positions within their peer groups, the pattern of results suggests that adolescents who occupy central positions in cohesive peer groups are significantly less likely than adolescents in other peer group structures to be involved in crime in any capacity. Centrality, an indicator of adolescents' capacity to direct peers' behavior and of their exposure to the normative expectations of the peer group, is generally the most strongly and consistently related to adolescents' criminal involvement. Adolescents' status prestige, an indicator of their popularity among their peers, was only weakly related to adolescents' criminal involvement.

Summary

The pattern of results in Table 8 suggests that peers' criminal involvement is somewhat more important for understanding adolescents' own criminal involvement than is adolescents' position in their peer groups or the structure of their peer group. That is, although all of the correlation coefficients indicate relatively weak relationships between

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peer group characteristics and adolescents' own criminal involvement, the correlation coefficients relating peers' criminal involvement to adolescents' own criminal involvement are two to three times larger than those relating the structural characteristics of peer groups (e.g., size, out-degree, and closeness) to adolescents' own criminal involvement.

Also of interest is the result that overall peer group size and out-degree are more strongly and consistently related to adolescents' criminal involvement than is in-degree. Whereas in-degree was significantly related to four of the nine measures of criminal involvement, both out-degree and overall peer group size were significantly related to eight of those measures. This pattern suggests that knowing who an adolescent chooses as friends (send network) is more important than knowing about who chooses the adolescent as a friend (receive network) for understanding his or her criminal involvement.

In subsequent analyses, I focused, for two reasons, on adolescents' send-and-receive friendship networks, rather than their send networks. First, the overall indicator of peer group size (a send-and-receive network measure) takes full advantage of all of the information about adolescent peer groups included in the Add Health study and most closely reflects the reality of the peer groups adolescents are embedded within. Second, there were only slight differences, never greater than 0.01, in the strength of the correlations between adolescents' type of criminal involvement and out-degree and overall peer group size.

Finally, the measures of peer group characteristics were generally more strongly

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related to adolescents' status as victims, as offenders, and as part of the victim-offender overlap during the first year of the study than during the second year of the study. Given that the peer group characteristics were measured during the first year of the study, and, thus, are less proximal to the Year 2 outcomes, this pattern of results is not surprising.

Group Comparisons

Although we know that victims and offenders share similar socio-demographic profiles (e.g., both groups tend to be male and live in urban areas), a review of the literature produced no studies that explicitly compared these two groups. Moreover, although we know that adolescents who are not involved in crime are generally socially advantaged relative to offenders and victims, we do not know how victims and offenders compare to one another, or how adolescents who are both victims and offenders fare against other types of adolescents. To begin to address this gap, Tables 9a and 9b present the results of the comparisons of individual-level differences between four groups of adolescents: those who were not involved in crime, those who were victims only, those who were offenders only, and those who were both a victim and an offender. The first panel of Table 9 (Table 9a) presents the results of the categorical variable comparisons (using the Cramer's Phi measure of association) and the second panel (Table 9b) shows the results of the mean difference comparisons (using one-way ANOVA's).

As shown in the first panel, there were significant differences across the four groups by adolescents' sex, racial/ethnic group, and substance use. The Cramer's phi coefficients, which are the appropriate bi-variate test statistic for non-square tables,

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indicate that sex has the strongest association with crime group, followed by substance use, and then by racial/ethnic group membership. Females were significantly less likely than males to have any criminal involvement, and males were 2.3 times more likely to be victims only, 1.2 times more likely to be offenders only, and 3.0 times more likely to be part of the victim-offender overlap (i.e., to be both a victim and an offender).

White adolescents were significantly less likely than non-whites to have any criminal involvement. Compared to whites, non-white adolescents were 1.2 times more likely to be victims only, 1.2 times more likely to be offenders only, and were 2.2 times more likely to be part of the victim-offender overlap. In terms of adolescents' family structure, the distribution of adolescents across crime groups is nearly identical to the distributions for whites and non-whites. Compared to adolescents living with two parents, adolescents living in other family structures were 1.3 times less likely to have no criminal involvement, 1.2 times more likely to be victims only, 1.2 times more likely to be offenders only, and were 1.4 times more likely to be part of the victim-offender overlap.

The distribution of adolescents across the four crime groups also differed by their use of alcohol and drugs. There were significant differences across crime groups for adolescents who did not use alcohol during either year of the study, who used alcohol during both years of the study, who did not use drugs during either year of the study, and who used drugs during both years of the study. Although no criminal involvement was the most common among all adolescents regardless of their substance use, adolescents who did not use any substance and those who consistently used alcohol were more likely

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to be offenders only than part of the victim-offender overlap or victims only, and were more likely to be part of the victim-offender overlap than to be victims only. The pattern of results is similar for adolescents who consistently used drugs; however, these adolescents were significantly more likely to be part of the victim-offender overlap than to be victims or offenders only.

The distribution across crime groups of adolescents whose use of alcohol or drugs was intermittent (i.e., either started or stopped their use between years) and with high or low physical maturity was not significantly different.

Table 9b presents the results of the mean differences in individual and peer group characteristics between the four crime groups. Estimates within rows that do not share the superscripts are significantly different from one another based on post-hoc Newman-Keuls tests ($p < .05$), which is the appropriate comparison statistic when making three or more comparisons and the possibility of making a type I error is increased (Kirk 1995).

The general pattern of results confirms that adolescents with no criminal involvement are more socially advantaged than are adolescents with any criminal involvement. Adolescents who were victims only or who were part of the victim-offender overlap were generally the most socially disadvantaged. Overall, adolescents with no criminal involvement shared the most in common (22 characteristics) with adolescents who were offenders only, although there were few statistically significant differences among adolescents with any criminal involvement.

In terms of the level of their individual criminal involvement, adolescents who were part of the victim-offender overlap were more involved in crime than were

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Table 9a. Cross-tab Comparison of Adolescents by Crime Group (n = 2000)

Variable	No Criminal involvement (n = 1071)	Victim only (n = 122)	Offender only (n = 442)	Part of the victim-offender overlap (n = 365)
Male	43%	7%	26%	24%
Female	67%	3%	22%	8%
Cramer's Phi**	0.30			
White	59%	5%	23%	13%
Non-white	40%	6%	27%	28%
Cramer's Phi*	0.15			
Two parent family	59%	5%	23%	14%
Other family structure	47%	6%	27%	19%
Cramer's Phi**	0.08			
High physical development	52%	6%	25%	17%
Low physical development	60%	4%	22%	14%
Cramer's Phi	0.09			
No drinking	63%	3%	23%	15%
Cramer's Phi**	0.21			
New drinker	57%	4%	25%	15%
Cramer's Phi	0.05			
Stop drinking	48%	7%	25%	19%
Cramer's Phi	0.09			
Consistent drinker	43%	10%	24%	23%
Cramer's Phi**	0.13			
No drug use	62%	5%	22%	11%
Cramer's Phi*	0.27			
New drug user	46%	1%	29%	24%
Cramer's Phi	0.09			
Stop using drugs	39%	14%	28%	19%
Cramer's Phi	0.10			
Consistent drug user*	40%	4%	26%	30%
Cramer's Phi	0.21			

** Difference between groups significant at $p < .01$
* Difference between groups significant at $p < .05$

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Table 9b. One-Way ANOVA Comparison of Adolescents by Crime Group (n = 2000)

Variable	No Criminal involvement (n = 1071)	Victim only (n = 122)	Offender only (n = 442)	Part of the victim-offender overlap (n = 365)
Mean Differences^				
Individual level of crime				
Victimization	0.00[a]	0.66[b]	0.00[a]	1.40[c]
Offending	0.00[a]	0.00[a]	0.57[b]	1.70c
Peer group characteristics				
Size	8.45[b]	7.75[a,b]	8.18[b]	7.09[a]
Out-degree	4.32[b]	4.32[b]	4.29[b]	3.41[a]
In-degree	4.13[b]	3.43[a]	3.89[a,b]	3.68[a,b]
Network density	0.19[b]	0.15[a]	0.18[a,b]	0.15[a]
Closeness	0.04[b]	-0.22[a]	0.07[b]	-0.14[a]
Bonacich centrality	0.07[b]	0.01[b]	0.03[b]	-0.26[a]
Status prestige	0.08[c]	-0.22[a]	-0.01[b,c]	-0.14[a,b]
Mean network victimization	0.21[a]	0.29[a,b]	0.28[a,b]	0.36[b]
Mean network offending	0.34[a]	0.35[a]	0.48[b]	0.53[b]
Peers' criminal involvement				
Proportion of friends who are victims	0.11[a]	0.17[b,c]	0.14[b]	0.19[c]
Proportion of friends who are offenders	0.16[a]	0.17[a]	0.23[b]	0.24[b]
Proportion of friends who are offenders only	0.21[a,b]	0.19[a]	0.27[c]	0.24[b]
Proportion of friends who are victims only	0.06[a,b]	0.08[b]	0.04[a]	0.06[a,b]
Proportion of friends who are not involved in crime	0.62[c]	0.54[b]	0.49[b]	0.39[a]
Proportion of friends who are part of the victim-offender overlap	0.13[a]	0.18[b]	0.19[b]	0.23[c]
Individual characteristics				
Interaction with peers	0.34[a]	0.47[a,b]	0.44[a,b]	0.60[b]
Age	17.05[a]	17.45[b]	16.86[a]	17.33[b]
Socio-economic status	0.19[b]	-0.02[a]	0.05[a,b]	-0.04[a]
Parental monitoring	0.09[b]	-0.08[a]	-0.01[a,b]	-0.01[a,b]
Relationship with parents	0.13[b]	-0.12[a]	0.00[a]	-0.01[a]
Communication with parents	0.13[b]	-0.06[a]	0.03[a,b]	-0.02[a]
Self-esteem	-0.03[a]	-0.07[a]	-0.03[a]	-0.12[a]
Adolescent support	0.16[b]	-0.11[a]	-0.11[a]	-0.30[a]
Depression	-0.05[a]	0.04[b]	0.05[b]	0.13[b]
Grade point average	2.83[c]	2.59[b]	2.50[b]	2.24[a]
Hostile school climate	-0.13[a]	0.14[b]	0.10[b]	0.22[b]
School attachment	-0.06[a]	0.17[b]	0.01[a,b]	0.10[a,b]

Note: Estimates within rows that do not share the same superscript are statistically different from one another based on post-hoc Newman-Kuels tests ($p < .05$).

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adolescents who were victims or offenders only. Members of the victim-offender overlap experienced significantly more victimizations than did adolescents who were victims only, and they committed significantly more offenses than did adolescents who were offenders only.

Peer group characteristics

Adolescents who were part of the victim-offender overlap had the smallest peer groups, although the overall size of their peer groups was not statistically different from adolescents who were victims only. Adolescents with no criminal involvement had the largest peer groups, although the overall size of their peer groups was not statistically different from adolescents who were offenders only. Members of the victim-offender overlap nominated significantly fewer friends than did adolescents in the other three groups, and adolescents who were victims only received significantly fewer friendship nominations than adolescents who were not involved in crime. Adolescents with any type of criminal involvement were not significantly different from one another in terms of in-degree, and there were no significant differences in the out-degree among adolescents who had no criminal involvement, who were victims only, or who were offenders only.

Concerning their positions within their peer groups, adolescents with no criminal involvement and adolescents who were offenders only were the most tightly integrated into relatively dense peer groups. Specifically, adolescents in these two groups enjoyed higher levels of closeness and status prestige in denser peer groups than did adolescents

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who were victims only or who were part of the victim-offender overlap.

Compared with the other three groups, which were not statistically different from one another, members of the victim-offender overlap occupied the least central positions within their peer groups. Adolescents who were victims only were the least popular among their peers, although their level of status prestige was not statistically different from adolescents who were part of the victim-offender overlap. Members of the victim-offender overlap were the second least popular, although their level of status prestige was not statistically different from adolescents who were offenders only. Adolescents with no criminal involvement were the most popular among their peers, although their level of status prestige was not statistically different from adolescents who were offenders only.

Finally, adolescents with no criminal involvement had the lowest levels of victimization in their peer groups, although the mean level of victimization in their peer groups was not statistically different from adolescent who were victims or offenders only. Members of the victim-offender overlap were located in peer groups with the highest levels of victimization, although their mean peer group victimization was not statistically different from adolescents who were victims only or offenders only.

Peers' criminal involvement

The results concerning the prevalence of peers' criminal involvement are not surprising. Adolescents with no criminal involvement were the least likely of the four groups to have friends with any criminal involvement and members of the victim-offender overlap were generally the most likely to have these friends. The pattern of

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findings for the levels of offending and victimization within peer groups is similar.

Individual Characteristics

Despite the fact that adolescents with no criminal involvement had the greatest opportunity to socialize with friends, given that they were the most integrated into the largest peer groups, this group had the lowest level of unstructured socializing with peers and their level of peer interaction was significantly lower than adolescents who were part of the victim-offender overlap. Members of the victim-offender overlap had the highest level of unstructured socializing with peers, although they were not significantly different from victims and offenders on this measure.

Adolescents with no criminal involvement enjoyed the highest socio-economic status, followed by adolescents who were offenders only. Moreover, these two groups enjoyed a significantly higher socio-economic status than did adolescents who were victims only or who were part of the victim-offender overlap. Adolescents with no criminal involvement enjoyed significantly better relationships with their parents than did adolescents with any type of criminal involvement. Additionally, adolescents with no criminal involvement and those who were offenders only had significantly better communication with their parents (e.g., talking about school and friends) than adolescents in the other two groups.

Interestingly, adolescents with no criminal involvement, those who were offenders only, and those who were part of the victim-offender overlap had similar levels of parental monitoring, although adolescents in the first group were the most highly

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monitored. The victims only group received the lowest levels of parental monitoring, although they did not differ significantly in this respect from offenders only or members of the victim-offender overlap.

The four groups did not differ significantly in their levels of self-esteem, but adolescents with no criminal involvement were significantly better off than the other three groups in terms of their levels of social support, how depressed they felt, their grade point averages, and how hostile they perceived their schools to be. Unexpectedly, adolescents with no criminal involvement were the least attached to their schools and were significantly different in this respect from adolescents who were victims only. Adolescents who were victims only reported the highest levels of school attachment.

Summary

There were a number of meaningful differences among adolescents who had no criminal involvement, who were victims only, who were offenders only, and who were part of the victim-offender overlap. Overall, adolescents who were victims only or who were part of the victim-offender overlap were the most socially disadvantaged in terms of both their individual and peer group characteristics. Adolescents in these two groups were located on the periphery of small, loosely connected peer groups and were the least popular among their peers. Additionally, the victims only and victim-offender overlap groups had the lowest levels of socio-economic status and the poorest relationships with their parents.

Overall, adolescents who were part of the victim-offender overlap had the most

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involvement in and exposure to crime. Adolescents who were part of the victim-offender overlap committed significantly more violent crime than those in the offender only group and were victimized significantly more often than those in the victims only group. Moreover, compared to the other three groups, members of the victim-offender overlap tended to have higher proportions of friends who were involved in crime as victims, offenders, or both and to have a lower proportion of friends with no criminal involvement.

Conclusions

Contrary to earlier claims that victims and offenders are probably not part of the same friendship networks (e.g., Fagan et al. 1987), the findings presented here suggest that most peer groups are heterogeneous in terms of members' criminal involvement. Additionally, the current results suggest that offenders belong to peer groups that are structurally similar to those of adolescents who are not involved in crime in terms of their size (whether measured as overall size, in-degree, or out-degree) and density. Offenders and adolescents with no criminal involvement are also similarly located within their peer groups. Adolescents in these two groups do not differ in terms of closeness, centrality, or status prestige.

Together, the findings that most adolescents have friends who are involved in crime as either a victim or an offender and that offenders and adolescents who are not involved in crime are part of structurally similar peer groups suggest that concerns about differences in the nature of friendships among delinquent and non-delinquent peer groups

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are overstated. More specifically, because most peer groups include adolescents with a variety of experiences with crime, including no criminal involvement, it appears unlikely that offenders are typically members of the cold, exploitive, and detached peer groups described by some (e.g., Hirschi 1969). However, adolescents who are victims only or who are part of the victim-offender overlap are part of peer groups with a different structure, and therefore, perhaps, a different nature.

Overall, adolescents who are victims only and those who are part of the victim-offender overlap are peripheral members of relatively small peer groups. Adolescents who are victims only have the smallest in-degree and the lowest status prestige, results that are consistent with earlier findings that victims are often rejected by their peers (e.g., Hodges & Perry 1999) and that victimization is stigmatizing. Despite having the lowest in-degree, adolescents in the victims only group were optimistic about their number of friendships, in the sense that there was no significant difference in the number of friends they nominated and the number of friends adolescents with no criminal involvement and who were offenders only nominated.

In contrast, adolescents who were part of the victim-offender overlap had a significantly lower out-degree than adolescents in the other three crime groups. There are two plausible interpretations of this finding. First, these adolescents may feel rejected by their peers. That is, they may think that others *do not like them* and, therefore, are not their friends. Second, it may be that these adolescents are the least social. That is, they may think of themselves as *not needing or wanting* friendships with others. The general pattern of results in Table 9b lend support to the first interpretation

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Adolescents who were part of the victim-offender overlap were not significantly different from the other three groups in terms of their in-degree, suggesting that they are sufficiently social that others still think of them as friends. However, these adolescents reported the lowest levels of social support and self-esteem and reported the highest levels of depression (although they were not significantly different from other adolescents with criminal involvement). This pattern of findings supports the idea that members of the victim-offender overlap feel a relatively high level of social rejection. Moreover, members of the victim-offender overlap are the most peripheral members of peer groups, in that they have the lowest levels of centrality. Because they are located on the outskirts of their peer groups, they may not believe that more central members of their peer groups are their friends.

Adolescents who are victims only and adolescents who are part of the victim-offender overlap are part of peer groups that are significantly smaller than those of adolescents with no criminal involvement and those who are offenders only. However, there are different underlying factors for this difference. Adolescents who are victims only have fewer friends because they generally have smaller in-degrees than adolescents in the other three crime groups; members of the victim-offender overlap have fewer friends because they generally have smaller out-degrees than adolescents in the other three groups. That is, fewer people think of adolescents who are victims only when they are asked to name their friends, and adolescents who are part of the victim-offender overlap think of fewer people when they are asked to name their friends.

The current results include an unexpected finding: adolescents who were not

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involved in crime had the lowest levels of school attachment and adolescents who were victims only had the highest levels of school attachment. Although school attachment was included in the current study as a control variable, I expected, consistent with social control theory (Hirschi 1969), that this measure would have a negative relationship with all types of criminal involvement. This finding may reflect the fact that adolescent who are victims only have few sources of social engagement outside of the school context. More specifically, adolescents who are victims only have poor parental relationships, are peripheral members of relatively small peer groups, and are considerably less popular among their peers than adolescents in the other three crime groups. Thus, the school context may play a more central role in the lives of these adolescents by providing parental figures in the form of teachers and by providing social interactions through classes and other school sponsored events.

The results in this chapter indicate that there are no clear boundaries in terms of the characteristics of adolescents who have experience with violent crime. Table 10 summarizes the significant differences among the four groups on the 31 characteristics in Tables 9a and 9b that do not reflect adolescents' or their peers' criminal involvement.[13] I excluded the variables related to crime for two reasons. First, I divided the adolescents into the groups based on their criminal involvement and in doing so created some inherent differences between the groups with respect to their personal criminal involvement. Second, my purpose here is to underscore the extent to which these four

[13] The variables excluded from the Table 10 summary are the two individual level of crime variables, two mean network crime variables, and the six peers' criminal involvement variables.

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groups of adolescents differ in aspects of their lives that do not directly reflect their personal involvement in crime.

As shown in Table 10, adolescents with no criminal involvement differ on only five characteristics from the offender only group, but on 14 from the victim only group, and on 15 from adolescents who were part of the victim-offender overlap. In contrast, the offender only group differs from the victim only and victim-offender overlap groups on only a few characteristics, suggesting that distinctions among the three groups with any criminal involvement are less meaningful. Overall, to the extent that grouping adolescents by their criminal experiences is a useful tool for theory and policy development, the substantive distinction would appear to be between adolescents who have experience as a violent crime victim and those who do not.

Table 10. Number of Significant Differences between Crime Groups

	No criminal involvement	Victim only	Offender only	Part of the victim-offender overlap
No criminal involvement	--------	--------	--------	--------
Victim only	14 (45%)	--------	--------	--------
Offender only	5 (16%)	3 (10%)	--------	--------
Part of the victim-offender overlap	15 (48%)	3 (10%)	6 (19%)	--------

Note: Number of differences are based on the 31 non-crime related variables in Tables 9a and 9b (see footnote 12). Numbers in parentheses are the percentage of characteristics the groups differ on.

In light of the findings presented here, researchers' focus on offenders and the negative consequences that frequently accompany offending seems too narrow. Among adolescents involved in crime, 30% were both offenders and victims. These adolescents,

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who make up the victim-offender overlap, are responsible for committing more crime than are adolescents who are only offenders, and they are more frequently the targets of crime than are adolescents who are only victims. Additionally, adolescents who were offenders only fared surprisingly well compared to the victims only and victim-offender overlap groups. In fact, among adolescents with any criminal involvement, this group of adolescents was the most similar to adolescents with no criminal involvement. Thus, the current findings suggest it is not offending that is critical for understanding the negative consequences of criminal involvement, but rather offending in combination with victimization. The current results also reinforce the idea that delinquency cannot be understood independently of adolescent victimization (e.g., Singer 1986; Lauritsen et al. 1991; McCarthy et al. 2002).

The following two chapters present the results of the multivariate analyses of the relationship between victimization and offending. In the next chapter, I present the results from a series of logistic regression models that examine the relationship between victimization and offending and whether peer group characteristics condition these associations.

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Chapter 4

Multivariate Relationships between Victimization and Offending

In this chapter, I assess the multivariate relationships between victimization and offending and address three main questions: 1) Are the positive relationships between victimization and offending the spurious result of adolescent peer group characteristics?; 2) Do adolescent peer group characteristics influence adolescents' risk for violent victimization and/or do they moderate the associations between victimization and offending?; and 3) Does the victim-offender overlap reflect reciprocal relationships between victimization and offending? To address the first two questions, I used logistic regression to examine the likelihood that adolescents will be a victim or an offender. In the analyses examining whether the relationship between victimization and offending is reciprocal, I used non-linear two-stage least squares logistic regression. This chapter contributes to our general understanding of adolescent criminal involvement by explicitly examining how adolescents' peer groups, an often-cited explanation for the relationship between victimization and offending, influence the victim-offender overlap.

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Cross-lag Logistic Regression Models [14]

In the first phase of the multivariate analyses, I assessed the effects of adolescents' status as a victim or an offender on their future status as a victim or an offender. Because it is not possible in the Add Health data to determine the temporal ordering of criminal events within years (i.e., there is no way to know whether a given offense in year 1 took place before or after any other criminal incident during year 1), I estimated cross-lagged (across-year) logistic regression models. These models, which use Year 1 measures of adolescents' criminal involvement to predict their criminal involvement in Year 2, ensure that the temporal ordering of criminal events meet the standards of causality tests.

Additionally, the peer group variables I included in these models were measured at Year 1. Using Year 1, rather than Year 2, measures of peer group characteristics helps to protect against selection effects influencing the results. Including both Year 1 peer group characteristics and Year 1 criminal involvement measures in the models increases our confidence in the validity of the peer group effects, in that they do not reflect the

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[14] In addition to the logistic regression results presented here, I also estimated Negative-Binomial Poisson models that examined whether the variety of offenses (e.g., shooting someone or stabbing someone) committed in year 1 influenced the variety of victimizations (e.g., being shot or being stabbed) adolescents experienced in year 2 and *vice versa*. With the exception of the peer group variables, which could not significantly differentiate among adolescents involved in different types of criminal involvement, the results of these models were consistent with the results reported in the text. The results of the main effect models are presented in Appendix D, along with a brief description of the modeling technique. I do not discuss them further because I do not believe the distinctions among adolescents involved in a greater or lesser variety, or experiencing more or fewer, violent criminal events are meaningful in these data. Twenty percent of adolescents in the Add Health study reported committing a violent offense in year 2 and fifteen percent reported being victims in year 2. In both cases, among adolescents reporting criminal involvement, about 50% reported being involved in only one event and another 25% reported involvement in only two events. Thus, although the logistic models do not take full advantage of the information in these data , the most meaningful distinction to be made, at least with respect to violent criminal involvement in these data, is between adolescents who are involved in crime and those who are not. Future research might consider ordinal probit regression as an alternative method for modeling violence in these data.

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tendency of adolescents to select peers who are similar to themselves with respect to their criminal involvement.

The first set of cross-lagged logistic regression models regress Victim Year 2 on Offender Year 1, controlling for Victim Year 1. Including the lagged (Victim Year 1) measure serves two purposes. First, it controls for the fact that one of the best predictors of future victimization is prior victimization. Second, prior research suggests that the effects of offending on victimization, and *vice versa*, may be stronger in the short-term than in the one-year time frames examined here (e.g., Shaffer 2000; Menard 2002). Thus, for example, failing to include Victim Year 1 in the model predicting Victim Year 2 would result in an inflated estimate of the effect of Offender Year 1. That is, part of the effect would actually represent the effect of being victimized in year 1 on being an offender in year 1. For the same reasons reviewed above, the second set of models regress Offender Year 2 on Victim Year 1, controlling for Offender Year 1.

To reduce the possibility of multicollinearity influencing the results, I inspected the correlation matrix of all of the variables included in the models. This matrix indicates that among variables other than egocentric network characteristics, the correlations are relatively small (never exceeding 0.47) and that multicollinearity is not likely.[15] However, among the egocentric network variables, there was some indication that multicollinearity would be problematic. Using a correlation of 0.75 as the threshold, which the large sample size justifies, the overall size of adolescents' peer groups was collinear with centrality ($r = 0.81$); in-degree was collinear with status prestige ($r = 0.87$);

[15] The exceptions are with the within year criminal involvement measures (e.g., Victim Year 1 and Offender Year 1), which do not exceed 0.62.

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and out-degree was collinear with status prestige ($r = 0.93$) and centrality ($r = 0.91$). Given that centrality and status prestige are relatively dependent on the size of adolescents' peer groups these high correlations make sense. Because of the high probability of introducing multicollinearity into the models, I excluded the three measures of peer group size in the final multivariate models.[16]

Additionally, the correlation matrix of all variables considered in the analyses indicated that the peer group variables (e.g., centrality, density, and status prestige) were more highly correlated with one another than with the outcome variables, which is an indicator that the regressors may be multicollinear. In preliminary analyses, I compared models that included each peer group variable separately, models that included these variables in different combinations, and a model that included all of the peer group variables. These analyses indicated that multicollinearity was not influencing the results. That is, adding the peer group characteristics alone or in combination did not produce substantial changes in the size or direction of their effect sizes or those of the other variables in the model; in fact, the results were virtually identical across models.

Finally, with the exception of the binary variables, for two reasons I standardized all of the variables before entering them into the models. First, some of the variables had ranges that were substantially larger than many of the other variables included in the analyses. For example, the original coding of the measure of adolescents' socializing with peers made it possible for this variable to take on a maximum value of 29 and the

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[16] I ran separate models examining the effects of overall peer group size, in-degree, and out-degree on victimization and offending. The results of these models indicated that, after controlling for the variables included in Table 11 (except the other peer group characteristics), none of the three measures of peer group size were significant predictors of Victim Year 2 or Offender Year 2.

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original coding of adolescents' grade point average could take on a maximum value of only 4.00. Thus, with their original coding, these two measures could not contribute equally to the analyses; the effect of adolescents' socializing with peers would substantially outweigh the effects of their grade point average on their criminal involvement. Second, standardizing the variables makes it possible to directly compare their effect sizes and, thus, to compare their relative contribution to adolescents' risk of victimization and offending.

Results

Victimization

Table 11 presents the results from two main effect models examining the influence on Victim Year 2 of Offender Year 1, peer group characteristics, and individual characteristics. These models address two questions: 1) Are the effects of offending on subsequent victimization in this sample consistent with the results from prior studies? and 2) Do peer group characteristics influence the likelihood of subsequent victimization after controlling for their prior offending?

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Table 11. Base Models: Cross-lag Logistic Regression Models of Victimization Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Offender Year 1	0.43***	1.53	0.45***	1.57
	(0.11)		(0.11)	
Victim Year 1	2.24***	9.39	2.25***	9.48
	(0.13)		(0.13)	
Sell drugs	0.89***	2.43	0.88***	2.41
	(0.19)		(0.20)	
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.08	0.92
			(0.13)	
Density	-----	-----	0.17**	1.19
			(0.05)	
Closeness	-----	-----	0.05	1.05
			(0.15)	
Status Prestige	-----	-----	-0.07	0.93
			(0.08)	
Peers' offending	-----	-----	-0.14	0.87
			(0.08)	
Peers' victimization	-----	-----	0.20**	1.22
			(0.08)	
Individual characteristics				
Interaction with peers	0.25***	1.28	0.27***	1.31
	(0.06)		(0.06)	
Male	1.01***	2.73	1.01***	2.75
	(0.10)		(0.10)	
White	-1.20***	0.30	-1.10***	0.33
	(0.12)		(0.13)	
Age	-0.56	0.57	-0.36	0.70
	(1.06)		(1.13)	
Age squared	0.01	1.01	0.01	1.01
	(0.03)		(0.03)	
Socio-economic status	-0.13	0.88	-0.12	0.89
	(0.10)		(0.11)	
Live with two parents	0.00	1.00	-0.02	0.97
	(0.24)		(0.25)	
Parental supervision	0.18	1.20	0.16	1.17
	(0.19)		(0.17)	
Communication with parents	-0.21	0.81	-0.19	0.83
	(0.17)		(0.19)	
Relationship with parents	-0.20	0.82	-0.21	0.81
	(0.15)		(0.17)	
High physical maturity	0.51**	1.67	0.53**	1.70
	(0.19)		(0.20)	
Grade point average	-0.35**	0.70	-0.34**	0.71
	(0.13)		(0.12)	
Hostile school climate	0.11	1.11	0.11	1.12
	(0.11)		(0.11)	

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Table 11. (Cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
School attachment	0.05	1.06	0.04	1.04
	(0.06)		(0.05)	
Social support	-0.03	0.97	-0.02	0.98
	(0.15)		(0.15)	
Self-esteem	0.13	1.14	0.16	1.16
	(0.13)		(0.13)	
Depression	0.29	1.33	0.32	1.37
	(0.16)		(0.16)	
Consistent drinker	0.34*	1.40	0.35*	1.42
	(0.16)		(0.17)	
Start drinking	0.71***	2.03	0.67***	1.96
	(0.18)		(0.17)	
Stop drinking	0.21	1.23	0.26	1.30
	(0.17)		(0.18)	
Consistent drug use	0.13	1.14	0.15	1.16
	(0.30)		(0.25)	
Start using drugs	0.16	1.18	0.17	1.19
	(0.19)		(0.19)	
Stop using drugs	-0.19	0.83	-0.18	0.84
	(0.21)		(0.18)	
At least 11 months between interviews	-0.07	0.93	-0.07	0.93
	(0.08)		(0.08)	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2
* $p < .05$, ** $p < .01$, *** $p < .001$

The results in Model 1 confirm, consistent with prior studies, that even after controlling for other important predictors of adolescents' risk for victimization, adolescent offenders are at significantly higher risk for future victimization than are non-offenders. Compared to non-offenders, adolescents who committed an offense during year 1 were 53% more likely to be a victim in year 2. Also consistent with prior research, prior victimization was the strongest predictor of subsequent victimization. Being a victim in year 1 increased adolescents' risk of subsequent victimization nine-fold.

As shown in Model 2 in Table 11, two of the peer group variables had significant

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main effects on the likelihood of adolescent victimization: peer group density and peers' victimization.[17] Adolescents who were part of relatively dense peer groups were at significantly higher risk for victimization than were adolescents in less dense peer groups. Specifically, every one standard deviation increase in peer group density increased the odds of being a victim in year 2 by 19%. Similarly, as the relative frequency of peers' victimization increased, so too did adolescents' personal risk of victimization. For every one standard deviation increase in the level of peer group victimization, the odds of being a victim in year 2 increased by 22%.

Although not a significant predictor of adolescents' risk of victimization, adolescents who enjoyed a relatively high level of closeness in their peer groups were at somewhat higher risk for victimization than were adolescents with lower levels of closeness. Additionally, although not statistically significant, adolescents who occupied relatively central positions within their peer groups or who enjoyed a relatively high level of status prestige (i.e., popularity) were less likely to be victims in year 2 than were adolescents who were less central or less popular members of their peer group.

Notably, the relative frequency of peers' offending did not significantly influence adolescents' risk of being victimized in year 2. Moreover, the relationship was negative. That is, if anything, peers' offending appears to *decrease* adolescents' own risk of victimization. Because other researchers using the Add Health data have found that

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[17] In addition to examining the effect of the relative frequency of peers' victimization and offending, I also tested all models including measures of the proportion of victims and offenders in adolescents' peer groups. These preliminary analyses indicated that the relative frequency of peers' criminal involvement was more consistently and strongly related to adolescents' own criminal involvement than was the proportion of victims or offenders in their peer group.

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peers' delinquency has a significant, positive effect on adolescent victimization (Schreck et al. 2003), I estimated additional models to test the robustness of this finding.

Beyond the results reported here, I estimated models that excluded Peers' victimization, Offender Year 1, and whether adolescents reported selling drugs in year 2, analyses that more closely resembled the Fisher et al. models.[18] The results of these additional analyses indicated that peers' violent offending had a positive, but non-significant, effect on adolescents' risk of victimization when their prior involvement in crime as an offender and their current involvement in selling drugs were excluded from the model; the odds ratio was 2.51. When peers' victimization was excluded from the model, the odds ratio increased to 2.88, although the relationship was not significant. This pattern of results further demonstrates the importance of considering adolescent offending for understanding adolescent victimization. The failure to include controls for adolescents' involvement in crime as offenders in models predicting adolescent victimization seriously distorts the observed effects of other regressors in the model.

To examine whether peer group characteristics moderate the effects of offending on victimization, models 3 through 5 in Table 12 present the results from analyses that included interactions between peer group characteristics, adolescents' own involvement in crime, and peers' criminal involvement.[19]

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[18] Even after excluding these measures, the current study and the Schreck et al. study still differ on the nature of peers' offending being examined. Specifically, the current study examines how peers' violent offending influences victimization, whereas the Schreck et al. study examines how more trivial peer offending (e.g., smoking, drinking, and skipping school) influences adolescent victimization.

[19] In addition to the results presented, I also examined models that included all possible interactions between peer group characteristics, between peer group characteristics and adolescents' own offending, and between peer group characteristics, peer group offending, and adolescents' own offending. However, multicollinearity became problematic when higher order interactions (i.e., 3-way or greater) were entered

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Table 12. Peer Group Interaction Models: Cross-lag Logistic Regression Models of Victimization Year 2

	Model 3^^		Model 4		Model 5	
	Coeff.	Odds Ratio	Coeff.	Odds Ratio	Coeff.	Odds Ratio
Criminal involvement						
Offender Year 1	0.51***	1.66	0.44***	1.55	0.45***	1.57
	(0.09)		(0.10)		(0.10)	
Victim Year 1	2.29***	9.87	2.26***	9.58	2.26***	9.58
	(0.13)		(0.13)		(0.13)	
Sell drugs	0.89***	2.44	0.89***	2.44	0.87***	2.39
	(0.21)		(0.20)		(0.20)	
Year 1 Peer group characteristics						
Centrality	-0.35**	0.70	-0.08	0.92	-0.06	0.94
	(0.12)		(0.13)		(0.12)	
Density	0.23***	1.26	0.16	1.17	0.30***	1.35
	(0.06)		(0.05)		(0.09)	
Closeness	0.06	1.06	0.06	1.06	0.03	1.03
	(0.15)		(0.14)		(0.14)	
Status Prestige	-0.07	0.93	-0.08	0.92	-0.09	0.91
	(0.07)		(0.08)		(0.08)	
Peers' offending	-0.16*	0.85	-0.33***	0.72	-0.12	0.89
	(0.08)		(0.09)		(0.08)	
Peers' victimization	0.21**	1.23	0.22***	1.25	0.21**	1.23
	(0.07)		(0.08)		(0.07)	
Individual characteristics						
Interaction with peers	0.28***	1.32	0.27***	1.31	0.26***	1.30
	(0.06)		(0.06)		(0.06)	
Male	1.02***	2.77	1.02***	2.77	1.01***	2.75
	(0.11)		(0.10)		(0.10)	
White	-1.10***	0.33	-1.10***	0.33	-1.06***	0.35
	(0.13)		(0.13)		(0.13)	
Age	-0.45	0.64	-0.35	0.70	-0.34	0.71
	(1.17)		(1.16)		(1.12)	
Age squared	0.01	1.01	0.01	1.01	0.01	1.01
	(0.03)		(0.03)		(0.03)	
Socio-economic status	-0.12	0.87	-0.13	0.88	-0.13	0.88
	(0.10)		(0.10)		(0.11)	
Live with two parents	-0.03	0.97	-0.03	0.97	-0.02	0.98
	(0.25)		(0.25)		(0.26)	
Parental supervision	0.15	1.16	0.16	1.17	0.16	1.17
	(0.17)		(0.18)		(0.18)	
Communication with parents	-0.21	0.81	-0.20	0.82	-0.18	0.84
	(0.19)		(0.19)		(0.19)	
Relationship with parents	-0.19	1.21	-0.20	0.82	-0.21	0.81
	(0.15)		(0.17)		(0.18)	
High physical maturity	0.53**	1.70	0.52**	1.68	0.53**	1.70
	(0.19)		(0.19)		(0.19)	
Grade point average	-0.33**	0.72	-0.34**	0.71	-0.34**	0.71
	(0.12)		(0.12)		(0.11)	

into the models. The results of these analyses also consistently indicated that adolescents' status prestige and closeness did not significantly condition the effects of the measures of criminal involvement or other peer group characteristics.

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Table 12. (cont'd)

	Model 3^^		Model 4		Model 5	
	Coeff.	Odds Ratio	Coeff.	Odds Ratio	Coeff.	Odds Ratio
Hostile school climate	0.12 (0.11)	1.13	0.12 (0.11)	1.13	0.11 (0.11)	1.12
School attachment	0.03 (0.05)	1.03	0.04 (0.05)	1.04	0.04 (0.05)	1.04
Social support	-0.03 (0.15)	0.97	-0.04 (0.15)	0.96	-0.02 (0.16)	0.98
Self-esteem	0.16 (0.13)	1.17	0.16 (0.13)	1.17	0.16 (0.14)	1.17
Depression	0.32** (0.15)	1.38	0.32* (0.16)	1.38	0.31* (0.15)	1.36
Consistent drinker	0.40* (0.18)	1.49	0.37* (0.17)	1.45	0.36* (0.18)	1.43
Start drinking	0.70*** (0.17)	2.01	0.68*** (0.17)	1.97	0.68*** (0.17)	1.97
Stop drinking	0.29 (0.18)	1.34	0.26 (0.17)	1.30	0.27 (0.18)	1.31
Consistent drug use	0.15 (0.26)	1.16	0.15 (0.26)	1.16	0.15 (0.26)	1.16
Start using drugs	0.16 (0.18)	1.17	0.18 (0.19)	1.20	0.17 (0.19)	1.19
Stop using drugs	-0.15 (0.23)	0.86	-0.16 (0.23)	0.85	-0.19 (0.22)	0.83
At least 11 months between interviews	-0.07 (0.08)	0.93	-0.07 (0.08)	0.93	-0.07 (0.08)	0.93
Interactions						
Offender Year 1 by Centrality	0.49** (0.15)	1.63	-----	-----	-----	-----
Offender Year 1 by Density	-0.16*** (0.06)	0.85	-----	-----	-----	-----
Offender Year 1 by Peer group offending	-----	-----	0.27** (0.08)	1.31	-----	-----
Density by Centrality	-----	-----	-----	-----	0.20** (0.08)	1.22

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2.
^^Only significant interactions are presented here. Models with non-significant interactions are presented in Appendix C.
* p < .05 , ** p < .01, *** p < .001

Model 3 in Table 12 presents the significant interactions between Offender Year 1 and the peer group variables.[20] As shown there, both Centrality and Density condition the effects of adolescent offending on their subsequent risk of victimization. Figure 3a

[20] Results from models that include non-significant interaction terms are presented in Appendix C.

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presents a graph depicting the interaction of Offender Year 1 and Centrality and Figure 3b presents a graph of the interaction of Offender Year 1 and Density. Among non-offenders, occupying a highly central position within their peer groups *reduced* the risk of victimization. However, among adolescent offenders, occupying a highly central position within their peer groups *increased* the odds of subsequent victimization. As illustrated in Figure 3b, the interaction between Offender Year 1 and Density was such that, although higher levels of peer group density increased the odds of subsequent victimization in Year 2 for adolescents, this effect was especially strong for non-offenders.

Figure 3a. Offender Year 1 by Centrality

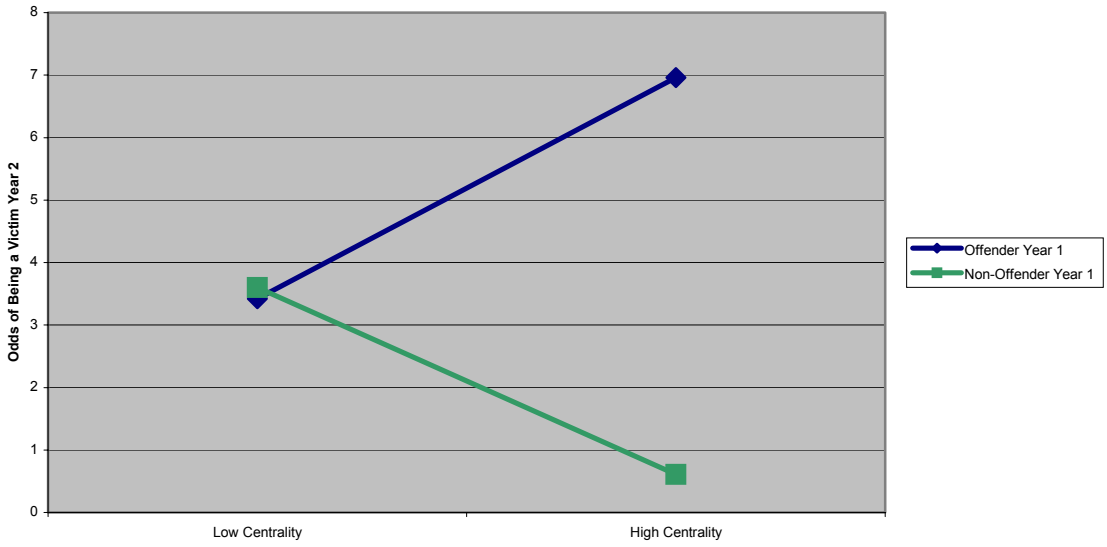

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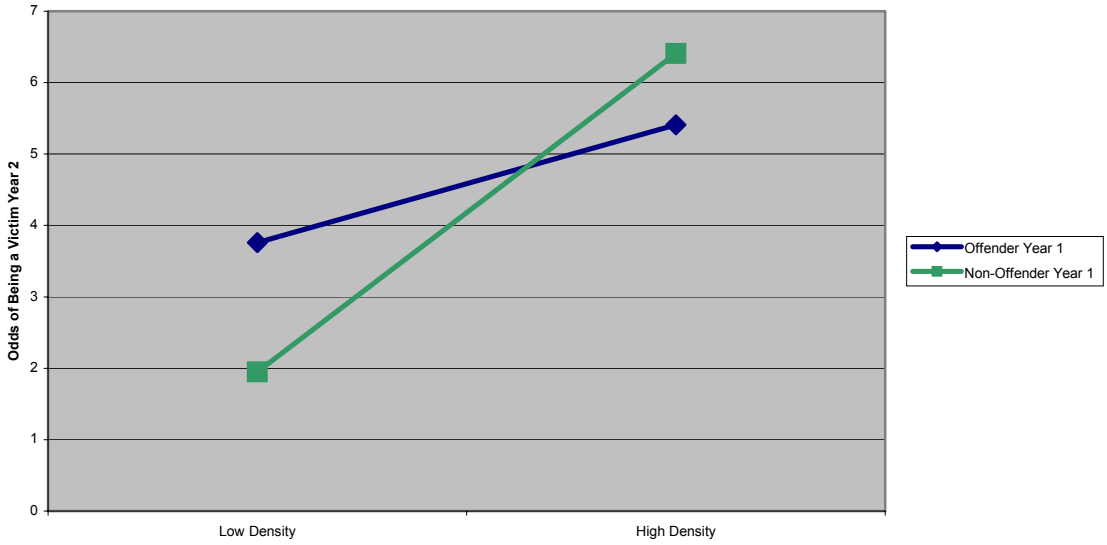
Figure 3b. Offender Year 1 by Density



Model 4 in Table 12 examines whether Peers' offending moderates the effect of Offender Year 1 on Victim Year 2. Including this interaction reveals a significant, negative main effect for Peers' offending. As depicted in Figure 4, although Peers' offending decreased the odds of subsequent victimization among non-offenders, among offenders Peers' offending increased the odds of subsequent victimization. This result, which further underscores the necessity of considering adolescents' involvement in crime as an offender in examinations of their victimization risk, is discussed in detail below.

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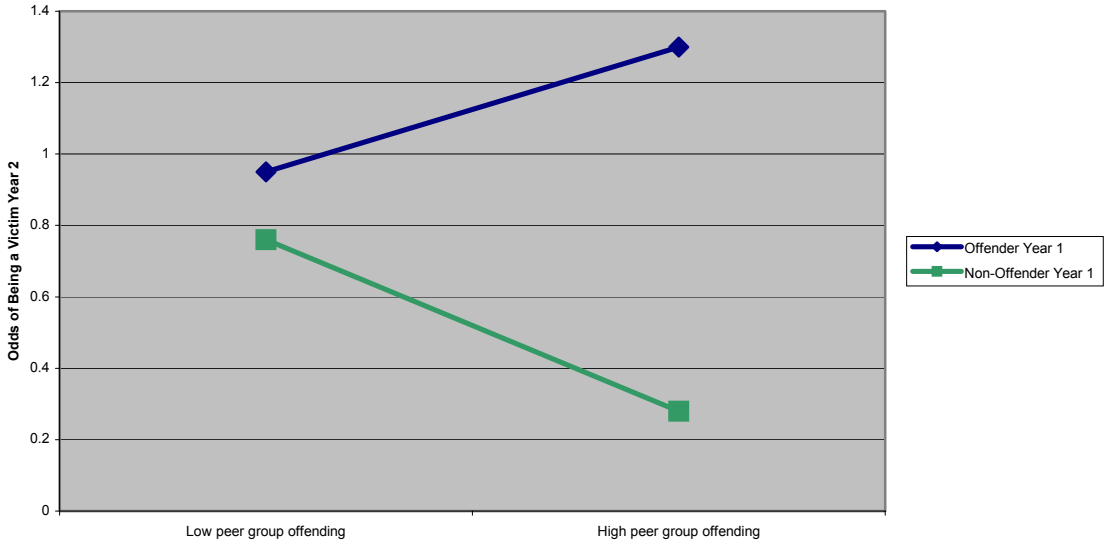
Figure 4. Offender Year 1 by Peer Group Offending



Finally, Model 5 in Table 12 examines whether peer group characteristics condition the effects of one another on adolescents' risk of victimization. Although I examined all possible two-way interactions among peer group characteristics (these models are presented in Appendix C), only one interaction was significant: peer group density by adolescents' centrality within the peer group. Figure 5 presents a graph of this relationship. As shown there, among adolescents who occupied a relatively peripheral position within their peer group (i.e., had low centrality), the odds of being a victim in year 2 increased as peer group density increased. However, among adolescents who occupied a highly central position within their peer groups, the odds of being a victim in year 2 decreased as peer group density increased.

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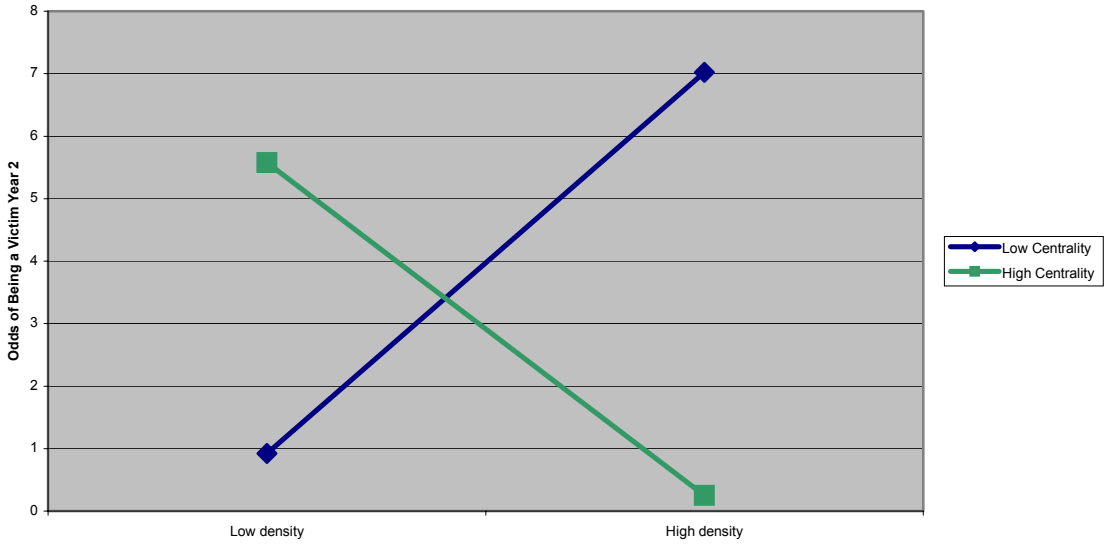
Figure 5. Centrality by Density



Offending

Table 13 presents the results from two main effects models examining the influence of Victim Year 1, peer group characteristics, and individual characteristics on Offender Year 2. The models address two questions: 1) Are the effects of victimization on the odds of subsequent offending consistent with the results from prior studies? and 2) Do peer group characteristics influence the odds of offending after controlling for adolescents' involvement in crime as victims?

The results in Model 1 in Table 13 indicate, consistent with prior research, that prior offending is the best predictor of subsequent offending. Prior offending increased the odds of subsequent offending three-fold. The results are also consistent with prior findings that, even after controlling for other important predictors of the likelihood of

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adolescent offending, adolescent victims are at significantly higher risk for offending than are non-victims. Specifically, the odds of subsequent offending was 110% higher for victims than for non-victims. This sizeable effect suggests that adolescent victimization is more important for understanding adolescents' involvement in crime as offenders than some previous studies have suggested (Fagan et al. 1987; Lauritsen et al. 1991; but see Shaffer & Ruback 2002).

Model 2 in Table 13 examines whether peer group characteristics influence the likelihood of adolescent offending after controlling for their prior status as victims. Consistent with the findings regarding victimization, two of the peer group variables had significant main effects: Density and Peers' offending. As peer group density increased, so too did the odds of subsequent offending. Every one standard deviation increase in peer group density increased the odds of subsequent offending by 14%. Similarly, the odds of committing a subsequent offense increased as the relative frequency of peers' offending increased. Specifically, for every one standard deviation increase in Peers' offending, the odds of committing an offense in year 2 increased by 19%.

The effects of Centrality, Closeness, and Status prestige on the odds of being an offender in year 2 were consistent with the results from the model predicting the odds of being a victim in year 2. Although not significant, Closeness was associated with a somewhat higher risk for offending, and Centrality and Status prestige were associated with a somewhat lower risk for offending. Peers' victimization had a weak, non-significant effect on the likelihood of adolescent offending.

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Table 13. Base Models: Cross-lag Logistic Regression Models of Offending Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Victim Year 1	0.74***	2.10	0.73***	2.08
	(0.13)		(0.12)	
Offender Year 1	1.24***	3.44	1.20***	3.32
	(0.20)		(0.20)	
Sell drugs	0.96*	2.60	0.94*	2.56
	(0.39)		(0.40)	
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.09	0.91
			(0.06)	
Density	-----	-----	0.13**	1.14
			(0.04)	
Closeness	-----	-----	0.07	1.07
			(0.08)	
Status Prestige	-----	-----	-0.08	0.92
			(0.08)	
Peers' offending	-----	-----	0.17***	1.19
			(0.03)	
Peers' victimization	-----	-----	0.02	1.02
			(0.03)	
Individual characteristics				
Interaction with peers	0.24***	1.27	0.24	1.27
	(0.05)		(0.05)	
Male	0.63***	1.88	0.65***	1.92
	(0.16)		(0.16)	
White	-0.39***	0.67	-0.33**	0.72
	(0.10)		(0.11)	
Age	-1.64	0.20	-1.20	0.30
	(1.20)		(1.09)	
Age squared	0.04	1.04	0.03	1.03
	(0.04)		(0.03)	
Socio-economic status	-0.13*	0.88	-0.12*	0.89
	(0.06)		(0.06)	
Live with two parents	0.10	1.09	0.08	1.08
	(0.20)		(0.20)	
Parental supervision	-0.11	0.89	-0.14	0.87
	(0.14)		(0.14)	
Communication with parents	-0.06	0.94	-0.04	0.96
	(0.12)		(0.12)	
Relationship with parents	0.10	1.10	0.11	1.12
	(0.10)		(0.11)	
High physical maturity	0.18	1.20	0.19	1.21
	(0.10)		(0.11)	
Grade point average	-0.27*	0.77	-0.25*	0.78
	(0.12)		(0.13)*	
Hostile school climate	0.24*	1.28	0.24	1.27
	(0.12)		(0.11)	

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Table 13. (Cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
School attachment	-0.14	0.87	-0.14	0.87
	(0.09)		(0.09)	
Social support	-0.10	0.90	-0.11	0.90
	(0.26)		(0.25)	
Self-esteem	0.23*	1.26	0.24*	1.27
	(0.11)		(0.10)	
Depression	0.50***	1.65	0.52***	1.68
	(0.07)		(0.08)	
Consistent drinker	0.31*	1.36	0.32*	1.38
	(0.16)		(0.16)	
Start drinking	0.38*	1.46	0.36*	1.43
	(0.17)		(0.17)	
Stop drinking	-0.23	0.80	-0.18	0.84
	(0.13)		(0.14)	
Consistent drug use	0.47***	1.60	0.44**	1.55
	(0.12)		(0.13)	
Start using drugs	0.70***	2.02	0.72***	2.05
	(0.10)		(0.10)	
Stop using drugs	0.13	1.13	0.11	1.12
	(0.24)		(0.27)	
At least 11 months between interviews	-0.06	0.94	-0.06	0.94
	(0.12)		(0.12)	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2
* $p < .05$, ** $p < .01$, *** $p < .001$

To examine whether peer group characteristics moderate the effect of victimization on offending, Models 3 through 5 in Table 14 present the results from analyses that include interactions between peer group characteristics, adolescents' own victimization, and peers' criminal involvement.[21] In contrast to the models predicting the

[21] In addition to the results presented, I also estimated models that included all possible interactions between peer group characteristics, between peer group characteristics and adolescents' status as a victim, and between peer group characteristics, peer group victimization, and adolescents' own victimization. However, as in the models predicting victimization, multicollinearity became problematic when higher order interactions (i.e., 3-way or greater) were entered into the models. The results presented in Table 14 were virtually identical whether the interaction terms were included separately or all at once, although the robust standard errors for the main and interaction effects were somewhat higher when all the interaction terms were entered simultaneously.

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odds of adolescent victimization, peer group characteristics generally did not condition the effects of Victim Year 1 on the odds of adolescent offending.

Table 14. Peer Group Interaction Models: Cross-lag Logistic Regression Models of Offending Year 2

	Model 3		Model 4		Model 5^^	
	Coeff.	Odds Ratio	Coeff.	Odds Ratio	Coeff.	Odds Ratio
Criminal involvement						
Offender Year 1	1.20***	3.32	1.20***	3.32	1.21***	3.35
	(0.19)		(0.19)		(0.19)	
Victim Year 1	0.70***	2.01	0.75***	2.12	0.73***	2.08
	(0.08)		(0.12)		(0.12)	
Sell drugs	0.93*	2.53	0.94*	2.56	0.94*	2.56
	(0.42)		(0.40)		(0.40)	
Year 1 Peer group characteristics						
Centrality	-0.05	0.95	-0.09	0.91	-0.12*	0.89
	(0.09)		(0.06)		(0.06)	
Density	0.13**	1.14	0.13***	1.14	0.12***	1.13
	(0.05)		(0.04)		(0.04)	
Closeness	0.08	1.08	0.07	1.07	0.07	1.07
	(0.08)		(0.08)		(0.08)	
Status Prestige	-0.10	0.90	-0.08	0.92	-0.13	0.88
	(0.06)		(0.08)		(0.08)	
Peers' offending	0.17	1.19	0.17	1.19	0.17***	1.19
	(0.03)		(0.03)		(0.03)	
Peers' victimization	0.02	1.02	0.05	1.05	0.03	1.03
	(0.03)		(0.03)		(0.03)	
Individual characteristics						
Interaction with peers	0.23***	1.26	0.23***	1.26	0.24***	1.27
	(0.05)		(0.05)		(0.05)	
Male	0.65***	1.92	0.65***	1.92	0.66***	1.93
	(0.15)		(-0.16)		(0.15)	
White	-0.32**	0.73	-0.33**	0.72	-0.31**	0.73
	(0.11)		(0.11)		(0.10)	
Age	-1.15	0.32	-1.19	0.30	-1.32	0.27
	(1.10)		(1.09)		(1.09)	
Age squared	0.03	1.03	0.03	1.03	0.04	1.04
	(0.03)		(0.03)		(0.03)	
Socio-economic status	-0.13*	0.88	-0.12*	0.89	-0.13*	0.88
	(0.06)		(0.06)		(0.06)	
Live with two parents	0.07	1.07	0.09	1.09	0.11	1.12
	(0.21)		(0.21)		(0.22)	
Parental supervision	-0.14	0.87	-0.14	0.87	-0.15	0.86
	(0.15)		(0.14)		(0.14)	
Communication with parents	-0.04	0.96	-0.04	0.96	-0.04	0.96
	(0.12)		(0.12)		(0.12)	
Relationship with parents	0.10	1.11	0.11	1.12	0.13	1.14
	(0.12)		(0.11)		(0.11)	
High physical maturity	0.19*	1.21	0.20	1.22	0.20	1.22
	(0.10)		(0.10)		(0.11)	

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Table 14 Cont'd

	Model 3		Model 4		Model 5^^	
	Coeff.	Odds Ratio	Coeff.	Odds Ratio	Coeff.	Odds Ratio
Grade point average	-0.25*	0.78	-0.25*	0.78	-0.25*	0.78
	(0.12)		(0.12)		(0.12)	
Hostile school climate	0.25*	1.28	0.24*	1.27	0.24*	1.27
	(0.11)		(0.11)		(0.11)	
School attachment	-0.14	0.87	-0.14	0.87	-0.15	0.86
	(0.10)		(0.09)		(0.09)	
Social support	-0.11	0.90	-0.11	0.90	-0.10	0.90
	(0.24)		(0.25)		(0.24)	
Self-esteem	0.23*	1.26	0.24*	1.27	0.24*	1.27
	(0.10)		(0.10)		(0.10)	
Depression	0.51***	1.67	0.51***	1.67	0.52***	1.68
	(0.08)		(0.08)		(0.08)	
Consistent drinker	0.33*	1.39	0.33*	1.39	0.33*	1.39
	(0.15)		(0.16)		(0.16)	
Start drinking	0.36*	1.48	0.36*	1.48	0.36*	1.43
	(0.18)		(0.17)		(0.18)	
Stop drinking	-0.17	0.84	-0.18	0.83	-0.18	0.84
	(0.14)		(0.14)		(0.14)	
Consistent drug use	0.43**	1.54	0.44**	1.55	0.44**	1.55
	(0.13)		(0.13)		(0.13)	
Start using drugs	0.72***	2.05	0.72***	2.05	0.73***	2.08
	(0.10)		(0.10)		(0.09)	
Stop using drugs	0.10	1.11	0.12	1.13	0.11	1.12
	(0.27)		(0.27)		(0.27)	
At least 11 months between interviews	-0.06	0.94	-0.05	0.95	-0.06	0.94
	(0.12)		(0.12)		(0.12)	
Interactions						
Victim Year 1by Centrality	-0.13	0.88	-----	-----	-----	-----
	(0.18)					
Victim Year 1 by Density	-0.01	0.99	-----	-----	-----	-----
	(0.23)					
Victim Year 1 by Closeness	-0.11	0.90	-----	-----	-----	-----
	(0.10)					
Victim Year 1 by Status Prestige	0.05	1.05	-----	-----	-----	-----
	(0.14)					
Victim by Peer Group Victimization	-----	-----	-0.09	0.91	-----	-----
			(0.05)			
Centrality by Status Prestige	-----	-----	-----	-----	0.08**	1.08
					(0.03)	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2.

^^Only significant interactions are presented here. Models with non-significant interactions are presented in Appendix C.

* p < .05 , ** p < .01, *** p < .001

Although not significant, the general pattern of results presented in Model 3 in Table 14 indicates that adolescent victims who are more tightly integrated into their peer

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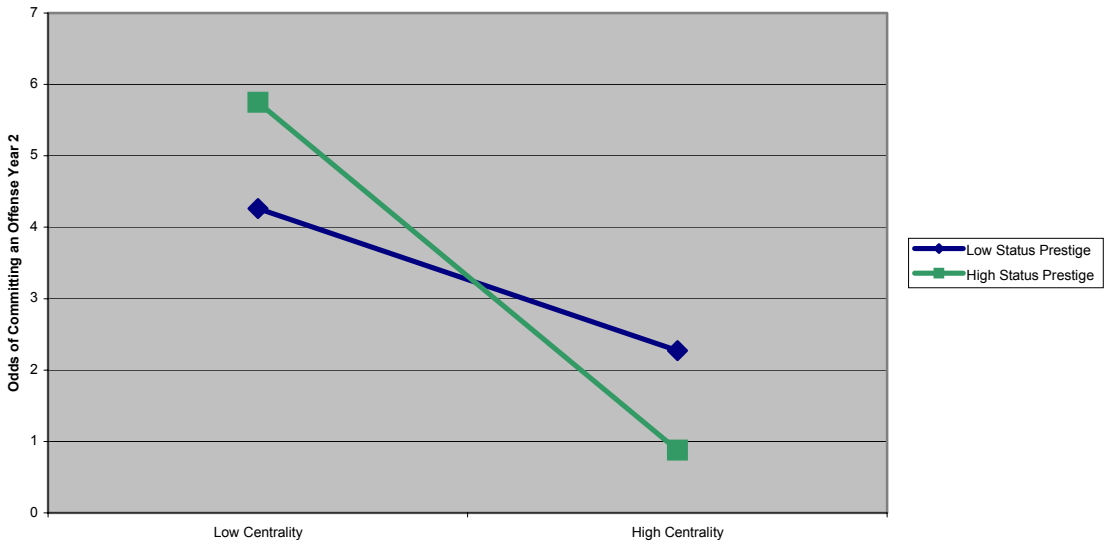
groups are less likely to offend than are victims who are less tightly integrated. As shown in Model 4 of Table 14, the effect of Peers' victimization on the odds of committing a subsequent offense was not dependent on adolescents' status as a victim.

Examinations of all possible two-way interactions between Centrality, Density, Closeness, and Status prestige revealed only one significant interaction: Status prestige by Centrality. Figure 6 presents a graph of this relationship. Although Centrality reduced the odds of offending among all adolescents, this effect increased multiplicatively as adolescents' Status prestige increased.

Figure 6. Centrality by Status Prestige



Summary

The results of the models predicting victimization and offending were generally consistent. Victim Year 1, Offender Year 1, and Density were all significant predictors

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of both Victim Year 2 and Offender Year 2 across years. Compared to non-victims, adolescent victims were at substantially higher risk of subsequent offending; and compared to non-offenders, adolescent offenders were at substantially higher risk of subsequent victimization. Moreover, these results held even after controlling for peers' involvement in crime and the dynamics of adolescents' peer groups.

Indicators of peers' criminal involvement were significant predictors of both outcomes, although the nature of the effect was different. Based on the odds of victimization, the relative frequency of peers' victimization was a significant predictor but the relative frequency of peers' offending was not. However, based on the odds of offending, the relative frequency of peers' offending was a significant predictor but the relative frequency of peers' victimization was not.

As noted above, other researchers using the Add Health data have found, contrary to my results, that peers' delinquency has a significant, positive effect on adolescent victimization (Schreck et al. 2003). It appears that this discrepancy results from the fact that Schreck et al. (2003) were examining the relationship between peers' offending and adolescents' victimization within years and the results presented here examined the relationship across years. Specifically, it may be the case that the influence of peers' offending on adolescents' victimization are not long lasting. To explore this possibility, I estimated within year logistic regression models of the odds of being a victim in year 1. The results of this analysis indicated that, when adolescents' year 1 involvement in crime was not included in the model, peers' offending was a significant, positive predictor of adolescents' risk of victimization during year 1. The fact that adolescents' own offending

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accounts for the within year effect of peers' offending on their risk of victimization further underscores the fundamental importance of including offending in models of victimization risk.

Instrumental Variable General Methods of Moments Models

If the relationship between victimization and offending is simultaneous, and a number of studies have produced evidence indicating that it is (Lauritsen et al. 1991; Shaffer 2000; Zhang et al. 2001), then the estimated effects of victimization and offending on one another reported above are inconsistent and biased. Specifically, when the error terms of the independent and dependent variables are correlated, the logistic regression coefficients overestimate the strength of the relationship between them (Foster & McLanahan 1996). When the outcome variable is continuous and normally distributed, the most straightforward method of handling this problem is instrumental variable regression using a two-stage least squares (2SLS) method (Foster & McLanahan 1996). Figure 7 displays the general, simplified non-recursive model (including only the victim and offender measures) implied by a simultaneous relationship between victimization and offending.

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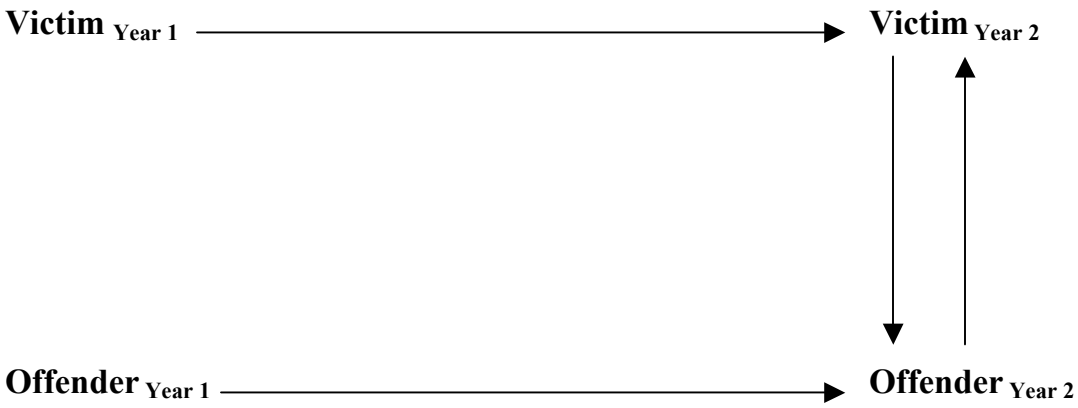
Figure 7. Non-Recursive Model of the Relationship between Victimization and Offending



Unfortunately, when the outcome variable is binary, 2SLS is inappropriate because this technique makes the same assumption of a normally distributed dependent variable as the ordinary least squares model. Foster (1997), however, has extended instrumental variable estimation (IVE) to logistic regression models using Generalized Methods of Moments (GMM). GMM makes few assumptions about the underlying data generating process and still provides robust estimation of the parameters (Greene 2003).[22] The parameter estimates the GMM-IVE technique generates can be thought of as non-linear two-stage least squares estimates (Amemiya 1974, as cited in Foster 1997).

Considering Offender Year 2 as the outcome (see Figure 7), in the first stage of the GMM-IVE analysis Victim Year 2 is regressed on Victim Year 1 and the other

[22] Despite this general robustness, it is not clear how the complex sampling scheme the Add Health study employs influences these parameter estimates.

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controls included in the model using a pseudo-2SLS procedure (see Foster 1997 pp. 474-475 for details). Victim Year 1 acts as an instrumental variable in this first stage; it is assumed to have a direct effect on Victim Year 2, but no direct effect on Offender Year 2. The predicted value for Victim Year 2 from the first stage of the analysis is then substituted for the value of Victim Year 2 in the second stage of the analysis that predicts Offender Year 2.

To estimate the effects of Offender Year 2 on Victim Year 2, I followed the same procedures, using Offender Year 1 as an instrument for Offender Year 2. To test the underlying assumption for selecting instruments to use in the analyses (e.g., that Offender Year 1 has a direct effect on Offender Year 2 but no direct effect on Victim Year 2), I re-estimated Model 1 from Table 11 including Offender Year 2 as a predictor; and Model 1 from Table 13 including Victim Year 2 as a predictor. The results of these analyses confirmed that the lagged measures, Offender Year 1 and Victim Year 1, influence the Year 2 measures only through their effects on the simultaneous measures, Offender Year 2 and Victim Year 2. That is, after including the simultaneous measures (Year 2), the lagged measures (Year 1) no longer significantly influenced adolescents' involvement in crime.

Although the GMM-IVE analyses presented below properly handle models where the independent variable is simultaneously determined with one or more of the dependent variables, it does not correct for the within-school clustering of adolescents. That is, these models do not adjust for the fact that adolescents who attend the same school are probably more similar to one another than they are to adolescents who attend a different

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school. The higher the ratio of between-school variation to within-school variation, and thus the within-school error correlation, the less efficient the GMM-IVE analyses presented below are for modeling these data and the greater the imprecision of the standard errors.

Results

Victimization

Table 15 presents the results of the GMM-IVE analysis of Victim Year 2. Model 1 presents the results of an analysis that excluded the peer group variables, and Model 2 presents the results of an analysis that included these variables. Despite the fact that these analyses of the within-year relationship between victimization and offending did not include corrections for within-school error correlations, the results of these models are generally consistent with those of the across-year analyses described above.[23]

[23] However, the standard errors in the GMM-IVE models are somewhat higher in the within-year models than in the across-year models.

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Table 15. GMM-IVE Logistic Regression Models of Victimization Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Offender Year 2	1.80*	6.05	1.85***	6.36
	(0.80)		(0.14)	
Victim Year 1	2.25***	9.48	2.36***	10.59
	(0.18)		(0.15)	
Sell drugs	0.57	1.77	0.71***	2.03
	(0.34)		(0.20)	
Year 1 Peer group characteristics				
Centrality	-----	-----	0.04	1.04
			(0.08)	
Density	-----	-----	0.15*	1.16
			(0.07)	
Closeness	-----	-----	0.16	1.17
			(0.09)	
Status Prestige	-----	-----	-0.05	0.95
			(0.08)	
Peers' offending	-----	-----	-0.25*	0.78
			(0.09)	
Peers' victimization	-----	-----	0.19*	1.21
			(0.08)	
Individual characteristics				
Interaction with peers	0.18*	1.20	0.20	1.22
	(0.09)		(0.07)	
Male	0.97***	2.63	0.99***	2.69
	(0.24)		(0.16)	
White	-1.13***	0.32	-1.14***	0.31
	(0.18)		(0.16)	
Age	-0.68	0.51	-0.70	0.50
	(1.09)		(0.88)	
Age squared	0.02	1.02	0.02	1.02
	(0.03)		(0.03)	
Socio-economic status	-0.05	0.95	-0.09	0.91
	(0.13)		(-0.10)	
Live with two parents	0.13	1.14	0.05	1.05
	(0.33)		(0.22)	
Parental supervision	0.13	1.14	0.05	1.05
	(0.24)		(0.17)	
Communication with parents	-0.43	0.65	-0.40	0.67
	(0.25)		(0.18)	
Relationship with parents	-0.07	0.93	-0.02	0.98
	(0.27)		(0.18)	
High physical maturity	0.59**	1.80	0.61***	1.84
	(0.19)		(0.14)	
Grade point average	-0.26*	0.77	-0.29**	0.75
	(0.12)		(-0.09)	
Hostile school climate	0.07	1.07	0.09	1.09
	(0.13)		(0.10)	

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Table 15. (Cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
School attachment	0.03	1.03	0.02	1.02
	(0.12)		(0.08)	
Social support	-0.01	0.99	-0.01	0.99
	(0.13)		(0.09)	
Self-esteem	0.03	1.03	0.08	1.08
	(0.14)		(0.09)	
Depression	0.09	1.09	0.15	1.16
	(0.22)		(0.14)	
Consistent drinker	0.11	1.12	0.12	1.13
	(0.26)		(0.18)	
Start drinking	0.41	1.51	0.38*	1.46
	(0.30)		(0.19)	
Stop drinking	0.28	1.32	0.32	1.38
	(0.25)		(0.18)	
Consistent drug use	0.01	1.01	0.07	1.07
	(0.28)		(0.18)	
Start using drugs	-0.06	0.94	-0.04	0.96
	(0.34)		(0.21)	
Stop using drugs	-0.49	0.61	-0.49*	0.61
	(0.30)		(0.19)	
At least 11 months between interviews	0.00	0.00	-0.03	0.97
	(0.19)		(0.12)	

Note: Numbers in parentheses are standard errors. Unless otherwise indicated, variables are measured at Year 2

* $p < .05$, ** $p < .01$, *** $p < .001$

As shown in Model 1 of Table 15, prior victimization was the strongest predictor of subsequent victimization, increasing the odds nine-fold. Notably, Offender Year 2 had the next strongest effect on Victim Year 2, and its effect was considerably stronger than the effect of Offender Year 1 (see Model 1, Table 11). Specifically, committing an offense in year 2 was associated with a six-fold increase in adolescents' odds of being victimized that same year. However, it is important to keep in mind that the temporal ordering of victimization and offending in these models is uncertain. That is, adolescents may have committed the offense before or after they were victimized.

As shown in Model 2 of Table 15, consistent with the findings from the across-

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year models, both Density and Peers' victimization significantly influenced adolescents' risk of subsequent victimization. Adolescents located in relatively dense peer groups were at significantly higher risk for victimization than were adolescents located in less dense peer groups. For every one standard deviation increase in peer group density, adolescents' risk of victimization in year 2 increased by 16%. For every one standard deviation increase in peers' victimization, adolescents' odds of being a victim increased by 21%.

However, in addition to the significant effects of Density and Peers' victimization, Peers' offending also significantly influenced being a victim in year 2. Adolescents located in peer groups with a relatively high level of violent offending were significantly less likely to be a victim in year 2 than were adolescents in peer groups with lower levels of offending. Specifically, for every one standard deviation increase in their peers' offending, adolescents' odds of subsequent victimization decreased by 22%. Although Peers' offending did not significantly influence the likelihood of adolescent victimization in the across-year models, the direction of its effect was negative in both the across- and within-year analyses. The fact that the relationship between peers' offending and adolescents' risk of victimization is consistently negative increases the probability that the true relationship between the two is negative and not a simply a product of the statistical model.[24]

In contrast to the models examining the across-year relationship between victimization and offending, none of the peer group variables (e.g., centrality, density,

[24] The results of the Negative-Binomial Poisson models, presented in Appendix C, also indicate that any true effect of peers' offending on adolescent victimization is negative.

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and peers' victimization) significantly moderated the effects of Offender Year 2 on Victim Year 2. However, given that the peer group variables were measured at year 1 and the Offender variable was measured at year 2, this finding is not surprising. Although peer group characteristics moderated the effect of Offender Year 1 on Victim Year 2, their effects were not sufficiently strong or long lasting to condition the effect of Offender Year 2 on Victim Year 2.

Offending

As with the within-year analyses of Victim Year 2, the results of the within-year analyses of Offender Year 2 are generally consistent with the results of the across-year analyses presented in the previous section. As shown in Model 1 of Table 16, which does not include the peer group variables, prior offending was among the best predictors of subsequent offending, increasing the odds three-fold. Only Victim Year 2 had a stronger effect. Being a victim in year 2 was associated with a five-fold increase in the odds of being an offender in year 2.

Again, however, the results presented here do not imply a statistical causal effect of Victim Year 2 on Offender Year 2 because it is not possible to establish the temporal ordering of criminal events. Nevertheless, because the results are consistent with the analyses that predicted Offender Year 2 using Victim Year 1, it is reasonable to argue that adolescents' involvement in crime as victims is a significant risk factor for subsequent offending.

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Table 16. GMM-IVE Logistic Regression Models of Offending Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Offender Year 1	1.22***	3.39	1.18***	3.25
	(0.14)		(0.14)	
Victim Year 2	1.72***	5.58	1.73***	5.64
	(0.38)		(0.39)	
Sell drugs	0.66*	1.93	0.64*	1.90
	(0.26)		(0.27)	
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.14	0.87
			(0.08)	
Density	-----	-----	0.09	1.09
			(0.07)	
Closeness	-----	-----	0.04	1.04
			(0.09)	
Status Prestige	-----	-----	-0.07	0.93
			(0.07)	
Peers' offending	-----	-----	0.20*	1.22
			(0.10)	
Peers' victimization	-----	-----	-0.02	0.98
			(0.09)	
Individual characteristics				
Interaction with peers	0.17*	1.19	0.19*	1.21
	(0.07)		(0.07)	
Male	0.41**	1.51	0.42**	1.52
	(0.16)		(0.16)	
White	-0.03	0.97	-0.03	0.97
	(0.16)		(0.16)	
Age	-2.27**	0.10	-2.03*	0.13
	(0.83)		(0.90)	
Age squared	0.06*	1.06	0.06*	1.06
	(0.03)		(0.03)	
Socio-economic status	-0.13	0.88	-0.11	0.90
	(0.10)		(0.09)	
Live with two parents	0.19	1.21	0.19	1.21
	(0.26)		(0.26)	
Parental supervision	-0.07	0.93	-0.11	0.90
	(0.18)		(0.18)	
Communication with parents	-0.14	0.87	-0.13	0.88
	(0.19)		(0.19)	
Relationship with parents	0.16	1.17	0.19	1.21
	(0.20)		(0.20)	
High physical maturity	-0.05	0.95	-0.04	0.96
	(0.14)		(0.14)	
Grade point average	-0.18	0.84	-0.18	0.84
	(0.10)		(0.10)	
Hostile school climate	0.21*	1.23	0.21*	1.23
	(0.10)		(0.10)	
School attachment	-0.13	0.88	-0.13	0.88
	(0.09)		(0.09)	

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Table 16. (Cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Social support	-0.08	0.92	-0.09	0.91
	(0.11)		(0.11)	
Self-esteem	0.18	1.20	0.18	1.20
	(0.10)		(0.10)	
Depression	0.46**	1.58	0.45**	1.57
	(0.15)		(0.16)	
Consistent drinker	0.27	1.31	0.27	1.31
	(0.18)		(0.19)	
Start drinking	0.28	1.32	0.26	1.30
	(0.22)		(0.22)	
Stop drinking	-0.22	0.80	-0.20	0.82
	(0.21)		(0.22)	
Consistent drug use	0.48*	1.62	0.46*	1.58
	(0.20)		(0.20)	
Start using drugs	0.62*	1.86	0.63	1.88
	(0.24)		(0.25)	
Stop using drugs	0.28	1.32	0.26	1.30
	(0.21)		(0.22)	
At least 11 months between interviews	-0.04	0.96	-0.03	0.97
	(0.14)		(0.14)	

^ Note: Numbers in parentheses are standard errors. Unless otherwise indicated, variables are measured at Year 2

* $p < .05$, ** $p < .01$, *** $p < .001$

Model 2 in Table 16 presents the results from a GMM-IVE analysis of Offender Year 2 that includes the peer group variables. As shown there, only one peer group variable, Peers' offending, was a significant predictor of adolescents' subsequent offending. For every one standard deviation increase in Peers' offending, the odds that an adolescent would commit a subsequent offense increased 22%. Consistent with prior research (Haynie 2001) using peers' self-reports of offending, even after controlling for adolescents' own prior offending, peers' offending continues to influence adolescents' own criminal behavior up to one year later.

Similar to the within-year analyses of Victim Year 2, and in contrast to the models examining the across-year relationship between victimization and offending, none

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of the peer group variables significantly moderated the effect of Victim Year 2 on Offender Year 2. Again, given that the peer group variables were measured at year 1 and the Victim variable was measured at year 2, this finding is not surprising.

Summary

The results of the GMM-IVE analyses contribute to the increasing evidence that there is a simultaneous relationship between victimization and offending. The results of the models presented in Tables 15 and 16 indicate that victimization and offending both significantly increase the likelihood of one another within-years, as well as across-years. Moreover, the results of the within-year models were generally consistent with those of the across-year models. Victim Year 2, Offender Year 2, and Peers' offending were all significant predictors of Offender Year 2 and Victim Year 2. Notably, although Peers' offending increased the likelihood of adolescents' own offending, it *decreased* their odds of subsequent victimization. Moreover, the effect of Peers' offending on the likelihood of subsequent victimization was comparable in size to the effect of Peers' Victimization, although the effect of the latter was to increase the likelihood of subsequent victimization.

The results of the within-year models suggest that the effect of Density on adolescent victimization is more robust than its effect on adolescent offending. Whereas Density significantly increased the likelihood of subsequent victimization, after controlling for adolescents' status as an Offender in year 2, it no longer significantly influenced the likelihood of subsequent offending.

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In contrast to the across-year models, none of the peer group characteristics moderated the effects of Offender Year 2 on Victim Year 2 or the effects of Victim Year 2 on Offender Year 2. Although the peer group characteristics significantly moderated the effects of Offender Year 1 and, to a lesser extent, Victim Year 1 on the likelihood of subsequent victimization and offending, their effects were not robust enough to moderate the same relationships when they occurred one year later.

Conclusions

Even after controlling for important characteristics of adolescent peer groups, offenders are at substantially higher risk for victimization than are non-offenders, and victims are at substantially higher risk for subsequent offending than are non-victims. The substantial increase in the risk of offending associated with victimization suggests that adolescent victimization is more important for understanding adolescent violent crime than previous research has suggested. Moreover, the current results further underscore the fundamental importance of adolescents' involvement in crime as offenders for understanding their risk of victimization. Specifically, not controlling for adolescents' offending produces misleading results in models predicting adolescents' risk of victimization. The within-year models (see Tables 15 and 16) also support claims that the victim-offender overlap reflects a reciprocal, simultaneous relationship between victimization and offending.

However, the current findings contradict the idea that the relationship between victimization and offending is primarily the result of peer processes. More specifically,

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one of the most common explanations for the victim-offender overlap is that adolescents who associate with offenders are likely to be offenders because of peer group processes that pull their behavior in line with the group's and to be victims because their criminal associates victimize them. According to this argument, adolescents located in peer groups with a high proportion of offenders or with a high level of peer group offending should be at relatively high risk for victimization. The results presented here provide only partial support for this position.

In particular, peers' offending significantly increased adolescents' risk of victimization only among adolescents who were involved in crime as offenders; among non-offenders, being part of a peer group with a high level of offending *decreased* their risk of victimization (see Model 4 in Table 12). There are two explanations for this pattern. First, it may be that peer group members use violence against one another in retaliation. That is, within-group retaliation may account for their increased victimization risk: adolescents who reported being offenders might have victimized other members of their peer group, who then retaliated with violence.

The second, more plausible, explanation is that offenders' increased risk of victimization comes from outside the peer group. Because most adolescent offending occurs in groups, it is likely that peer group members offend together. When their victims retaliate, they target only those peer group members who were involved in the initial event. Otherwise, having friends who are 'tough' provides protection from outside threats. Support for this position comes from the findings that peers' victimization was generally not associated with adolescents' own offending. If the peer group members are

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especially likely to victimize one another, then there should have been a positive association between peers' victimization and the likelihood of adolescent offending.

Taken together, the findings regarding peers' criminal involvement and adolescents' own criminal involvement suggest that the influence of peers' criminal behavior on adolescents' own criminal behavior is more specific than general. Whereas their peers' victimization continues to influence adolescents' own victimization up to one year later, it does not influence their offending behavior. Similarly, peers' offending influences adolescents' own offending across years, but not their risk of victimization.

Importantly, the current findings indicate that peer group characteristics similarly influence adolescents' risk of both victimization and offending, and that they moderate the effects of offending on adolescents' risk of victimization. Thus, the peer group appears to be equally as important for understanding adolescents' involvement in crime as victims as it is for understanding their involvement in crime as offenders. The current findings also confirm that the peer group processes that influence adolescents' own involvement in crime are more complex than the typically studied measures of the number of delinquent peers and how frequently adolescents interact with these peers.

Although the size of peer groups generally did not influence adolescents' victimization and offending, another important peer group characteristic, density, influenced adolescents' risk of both. Adolescents who were part of peer groups in which most adolescents are friends were at increased risk for both victimization and offending. Thus, in peer groups where information about opportunities to offend, about members' vulnerability to crime, or about members' offensive behavior flows more freely, and

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therefore is more likely to reach those outside of the peer group, risk of criminal involvement is higher.

However, being part of a dense peer group was especially likely to increase the likelihood of victimization for non-offenders. One possible explanation of this finding is that information about offensive behavior does not flow as freely through the network as does information about vulnerability to crime. That is, adolescents may be more likely to know, for example, that a friend has money than they are to know that a friend has threatened someone with a weapon.

Moreover, despite their high visibility (i.e., centrality), in fact, in part because of their high visibility- or some factor closely related to visibility, peer groups did not provide the same protection against victimization to centrally located offenders as they did to centrally located non-offenders. One interpretation of this effect is that as offenders' visibility increases, the benefits of victimizing him or her (e.g., increased status prestige because others are more likely to learn of the event) begin to outweigh the costs (e.g., that the target will fight back).

The effects of the control variables on adolescents' involvement in crime were generally consistent across models. Being male, white, and doing well in school were all significantly and negatively related to both victimization and offending in year 2. Notably, time spent socializing with peers was a significant predictor of both victimization and offending. For every one standard deviation increase in unstructured socializing with peers, adolescents' odds of offending increased by 27% and their odds of victimization increased by 31%. What is important about this finding is that even after

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controlling for other peer related factors, particularly peers' involvement in crime both as victims and as offenders, simply spending time with peers increased the likelihood of criminal involvement.

In addition to providing further support for an individual-level routine activity perspective, this finding also supports the hypothesis that calls to abandon value-neutral activities as predictors of adolescent victimization were premature. Specifically, even after controlling for adolescents' pattern of drug and alcohol use and their unstructured socializing, important components of the most common conceptualization of delinquent lifestyles, offending continues to significantly increase their risk of victimization, and *vice versa*. Moreover, this pattern of results suggests, in contrast to common practices, that distinctions between deviant and routine activities are warranted. That is, deviant activities (e.g., alcohol and drug use) and routine activities (e.g., hanging out with friends after school) each make independent contributions to the likelihood of adolescents' involvement in crime as victims and as offenders.

The results presented in this chapter were generally consistent across models. In particular, many of the same factors were similarly associated both with victimization and with offending. The next chapter presents the results from bi-variate probit models that explicitly examine whether victimization and offending are different outcomes of the same underlying social process as some prior studies have suggested (Singer 1986; Fagan et al. 1987; Schreck 1999; Shaffer & Ruback 2002). Additionally, the chapter examines how individual and peer group characteristics influence the likelihood of being part of the victim-offender overlap (i.e., being both a victim and an offender) during Year 2 and

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during both years of the study.

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Chapter 5

Membership in the Victim-Offender overlap and the Role of School Context

The basic premise of research on the victim-offender overlap is that there is a population of individuals who are both victims and offenders. Although previous studies have produced overwhelming evidence supporting this premis, two fundamental questions remain: 1) Are victimization and offending both outcomes of the same underlying social process? and 2) What factors influence whether adolescents will be part of the victim-offender overlap? This chapter examines each of these issues using bi-variate probit models. Moreover, although the results presented in the previous chapter indicate that the victim-offender overlap is not the spurious result of peer group processes, the analyses presented there did not examine how school context influences the relationship between victimization and offending. Here I use hierarchical linear models (HLM) to explore how school context influences the relationships among victimization, offending, and peer groups.

Bi-variate Probit Models

Bi-variate probit models are useful for determining whether victimization and offending both reflect the same underlying social process. If they do, then bi-variate probit models are also appropriate for identifying the factors that predict whether adolescents will be part of the victim-offender overlap (i.e., will be both a victim and an offender). If the same social process jointly determines both outcomes, then the victim-

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offender overlap implies the following two equations:

$$Pr(\text{Victim}_i = 1) = \beta_1 X + \varepsilon_{i1} \quad (1)$$

$$Pr(\text{Offender}_i = 1) = \beta_2 X + \varepsilon_{i2} \quad (2)$$

$$E[\varepsilon_{i1}, \varepsilon_{i2}] = \Phi(0,0,1,1,\rho) \quad \text{(Greene 2003; Britt 2000)}$$

Where:

Φ = the bivariate normal central distribution function

and

ρ = the tetrachoric correlation coefficient

The bi-variate probit results presented below have two advantages compared to the GMM-IVE results presented in the previous chapter. First, although GMM-IVE models correctly handle the error correlation between victimization and offending, these models do not jointly estimate the outcomes. Each outcome must still be estimated independently. The second advantage is that the bi-variate probit models make it easy to assess the strength of the error correlation between victimization and offending. More specifically, to the extent that the model is properly specified, the tetrachoric correlation coefficient (ρ, or rho, which is the correlation parameter for the error correlation) indicates the extent to which victimization and offending reflect the same underlying process, net of any covariates (see Greene 2003, pp. 710-719 for more details).

When $\rho = 0$, then the two outcomes are independent and can be modeled separately (An et al. 1993; Greene 2003). When $\rho = -1$, the two outcomes are exactly negatively correlated and when $\rho = 1$ then the two outcomes are perfectly correlated and

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basically represent the same phenomenon.

Test for a Common Underlying Social Process

Table 17 presents the results from two bi-variate probit models. Model 1 presents the results of an analysis of the joint probability of victimization and offending (i.e., being both a victim and an offender) that excludes the peer group variables; and Model 2 the results from the same analysis that includes the peer group variables. The model Log likelihood, ρ, and the results of the –2Log likelihood chi-square test that the models are independent are presented in the last row of Table 17. To the extent that Models 1 and 2 omit important factors related to both victimization and offending, the reported ρ's (see last row of Table 17) simply reflect specification error (Greene 2003). However, it is reasonable to argue that the observed ρ's do not primarily reflect model misspecification for two reasons. First, the model includes an extensive list of control variables, reflecting important factors across a variety of domains known to influence adolescent criminal involvement (e.g., substance use, stratification factors, and peers). Second, the effect size is large enough, 0.51, that it is unlikely that including additional controls, or otherwise respecifying the model, would sufficiently reduce this correlation to make it non-significant.

As shown in the last row of Table 17, $\rho = .51$ for each of the models and is highly significant ($p < .001$), as is the likelihood ratio test for the hypothesis that the two equations are independent ($x^2 = 426.10$, $p < .001$). This moderate correlation suggests

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Table 17. Bi-variate Probit Regression of Victimization and Offending

	Model 1		Model 2	
	Victim Year 2	**Offender Year 2**	**Victim Year 2**	**Offender Year 2**
Criminal involvement				
Offender Year 1	0.27***	0.71***	0.29***	0.69***
	(0.04)	(0.11)	(0.05)	(0.11)
Victim Year 1	1.26***	0.44***	1.27***	0.44***
	(0.06)	(0.08)	(0.06)	(0.07)
Sell drugs	0.52***	0.58*	0.52***	0.57*
	(0.11)	(0.23)	(0.12)	(0.24)
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.02	-0.04
			(0.07)	(0.03)
Density	-----	-----	0.08**	0.07***
			(0.03)	(0.02)
Closeness	-----	-----	0.01	0.04
			(0.07)	(0.05)
Status Prestige	-----	-----	-0.03	-0.04
			(0.03)	(0.04)
Peers' offending	-----	-----	-0.09*	0.10***
			(0.04)	(0.02)
Peers' victimization	-----	-----	0.12**	0.00
			(0.04)	(0.02)
Individual characteristics				
Male	0.52***	0.36***	0.52***	0.37***
	(0.08)	(0.09)	(0.08)	(0.09)
White	-0.64***	-0.23***	-0.60***	-0.20***
	(0.05)	(0.05)	(0.07)	(0.06)
Age	-0.07	-0.80	-0.03	-0.56
	(0.61)	(0.67)	(0.63)	(0.62)
Age squared	0.00	0.02	0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Socio-economic status	-0.07	-0.08*	-0.06	-0.07*
	(0.05)	(0.03)	(0.05)	(0.03)
Live with two parents	0.00	0.05	-0.02	0.05
	(0.11)	(0.11)	(0.11)	(0.11)
High physical maturity	0.26*	0.12*	0.27*	0.13*
	(0.12)	(0.06)	(0.12)	(0.06)
Parental supervision	0.06	-0.08	0.05	-0.09
	(0.08)	(0.08)	(0.08)	(0.08)
Communication with parents	-0.06	-0.01	-0.05	0.00
	(0.11)	(0.07)	(0.12)	(0.07)
Relationship with parents	-0.13	0.03	-0.13	0.04
	(0.07)	(0.06)	(0.08)	(0.06)
Grade point average	-0.19**	-0.15*	-0.18**	-0.15*
	(0.07)	(0.07)	(0.06)	(0.07)
Hostile school climate	0.06	0.14*	0.06	0.14*
	(0.06)	(0.06)	(0.05)	(0.06)
School attachment	0.03	-0.08	0.03	-0.08
	(0.04)	(0.05)	(0.03)	(0.05)

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Table 17. (Cont'd)

	Model 1		Model 2	
	Victim Year 2	**Offender Year 2**	**Victim Year 2**	**Offender Year 2**
Social support	-0.01	-0.05	-0.00	-0.06
	(0.07)	(0.14)	(0.07)	(0.14)
Self-esteem	0.07	0.13*	0.08	0.13*
	(0.07)	(0.06)	(0.07)	(0.05)
Depression	0.18*	0.29***	0.19*	0.29***
	(0.08)	(0.04)	(0.08)	(0.04)
Consistent drinker	0.20*	0.17*	0.19*	0.18*
	(0.08)	(0.08)	(0.09)	(0.08)
Start drinking	0.41***	0.22**	0.38***	0.21*
	(0.09)	(0.09)	(0.09)	(0.09)
Stop drinking	0.10	-0.15*	0.12	-0.12
	(0.09)	(0.07)	(0.09)	(0.08)
Consistent drug use	0.04	0.26***	0.05	0.23***
	(0.16)	(0.06)	(0.13)	(0.07)
Start using drugs	0.06	0.39***	0.06	0.41***
	(0.11)	(0.06)	(0.11)	(0.06)
Stop using drugs	-0.09	0.06	-0.09	0.05
	(0.10)	(0.13)	(0.11)	(0.15)
Interaction with peers	0.13**	0.14***	0.14***	0.13***
	(0.04)	(0.03)	(0.04)	(0.02)
At least 11 months	-0.02	-0.04	-0.02	-0.04
between interviews	(0.04	(0.06)	(0.04)	(0.06)
Log likelihood	-1273.19		-1264.75	
rho	0.51***		0.51***	
	(0.02)		(0.02)	
rho x^2	426.19		423.26	
p-chi2	0.001		0.001	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2
* p < .05, ** p < .01, *** p < .001

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that victimization and offending, although distinct, are common outcomes of an underlying social process. The parameter is not so large that it leads to the conclusion that victimization and offending are essentially the same thing. Nevertheless, it is large enough to speculate that victimization and offending are common outcomes of the same social process. The fact that entering the peer group variables into the model did not affect ρ provides further evidence that the victim-offender overlap is not the spurious result of peer group characteristics or peers' criminal involvement.

Common Predictors

Given that victimization and offending likely reflect a common underlying social process, the next step is to identify factors that similarly influence both outcomes. To do this, I compared the coefficients from the joint probability models predicting Victim Year 2 and Offender Year 2 presented in Table 17. Victimization and offending share 11 of the 17 variables that significantly influence the joint probability of victimization and offending in Model 1 (which includes 27 predictors) and 13 of the 18 significant predictors in Model 2 (which includes 33 predictors).

Consistent with the results of the independent logistic models that predicted the probability of Victim Year 2 and Offender Year 2, Victim Year 1 and Offender Year 1 significantly increased the likelihood of both outcomes across Models.[25] As shown in Model 2 of Table 17, Density significantly increased the likelihood of victimization and offending and Peers' victimization increased the likelihood of victimization but not

[25] The pattern of results from the independent probability GMM-IVE models presented in the previous chapters and from the joint probability models presented here is essentially the same.

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offending. Peers' offending decreased the likelihood of Victim Year 2 and increased the likelihood of Offender Year 2. Thus, considered together, the GMM-IVE and bi-variate probit models, both of which correct for the simultaneous relationship between victimization and offending, suggest that having peers with tough, aggressive social identities is a deterrent to being targeted for violence.

The importance of this finding is two-fold. First, it further contradicts the idea that adolescent offenders are more likely to be victims primarily because they associate with other offenders who subsequently victimize them. Second, it corroborates the claims of some youth that gangs and other peer groups are a way to protect themselves from hardships and dangers on the street (Miller 1998; McCarthy et al. 2002). Specifically, all else being equal, being part of a "tough crowd" reduces adolescents' risk of subsequent victimization.

In terms of the control variables, across the two models, selling drugs, being male, having a high level of physical development, being depressed, being a consistent drinker, and socializing with peers relatively frequently were all associated with an increased risk of involvement in crime as both a victim and an offender. Being white and having a relatively high grade point average were both associated with a decreased likelihood of being part of the victim-offender overlap.

The two outcomes differed in terms of the influence of five significant regressors. Whereas Socio-economic status, Hostile school climate, Self-esteem, Consistent drug use, and Start using drugs are all significant predictors of Offender Year 2, they did not significantly influence the likelihood of Victim Year 2. Adolescents' substance use

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appears to be more important for understanding their involvement in crime as offenders than as victims. This finding is not particularly surprising because, although I included the substance use measures as controls for involvement in a "deviant lifestyle," they are actually indicators of illegal behaviors. Thus, they should be expected to have a stronger association with other illegal outcomes than with victimization.

Hierarchical Linear Models

Examining whether school context influences the victim-offender overlap requires multi-leveling modeling techniques. Hierarchical linear models (HLM) are appropriate when there are two levels of data, such as the students in the Add Health study who are nested within schools. As noted earlier, adolescents attending the same schools are likely to be more similar to one another than to students attending different schools, and thus the data likely violate the assumption of independent errors. Because I am interested in examining individual and contextual effects on victimization and offending, multi-level models are especially appropriate. The general form for the level-1 (individual) model is:

$$\text{Log}_n[\text{odds}(\text{outcome}_{ij} = 1)] = \beta_{0j} + \beta_{1j}X_{\bullet j} + \beta_{2j}X_{\bullet j} + \ldots \ \beta_{kj}X_{\bullet j} \qquad (1),$$

where the log odds of Victim Year 2 or Offender Year 2 for adolescent *i* in school *j* is a function of the *k* individual-level predictors centered on their grand mean.

The general form for the level-2 (school) model is:

$$\beta_{01} = \gamma_{00} + \gamma_{01}X_{1\bullet} + \gamma_{02}X_{2\bullet} + \gamma_{0k}X_{k\bullet} + \mu_{0j} \qquad (2)$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j} \qquad (3)$$

.

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.

$$\beta_{kj} = \gamma_{k0} \quad (4),$$

where, β_{01} is a function of the *k* individual-level variables centered on their grand mean. The μ terms in equation lines 2 and 3, are school-level error terms that represent the unique effect of school *j* on variable *k*, net of the covariates.

Table 18 presents the results of the logistic HLM analyses of Victim Year 1 and Victim Year 2. Model 1 in Table 18 presents the results of the logistic HLM analysis of Victim Year 2, and Model 2 the results of the examination of Offender Year 2. As shown there, none of the school-context measures were significant predictors of Victim Year 2 or of Offender Year 2, although the effect of mean school-level offending was marginally significant in Model 2 ($p = 0.06$). The lack of significant results may reflect the lack of variation across the 15 schools included in the current research. Moreover, because the models include seven school-level predictors, but only 15 schools, the models probably lack the power to detect small or moderate effect sizes.

The effects of the level-1 predictors were generally consistent with the results presented in the previous analyses. Thus, I do not discuss them here, except to note that at least with respect violence in these data, the victim-offender overlap does not appear to be the spurious result of school-context.

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Table 18. Logistic HLM Models of Criminal Involvement Year 2 (n=2000)

	Model 1 **Victim Year 2** γ (Std. Error)	Model 2 **Offender Year 2** γ (Std. Error)
Criminal involvement		
Offender Year 1	0.43*	1.25***
	(0.17)	(0.14)
Victim Year 1	2.69***	0.74***
	(0.17)	(0.16)
Sell drugs	0.91**	1.01***
	(0.27)	(0.24)
Year 1 Peer group characteristics		
Centrality	-0.06	-0.08
	(0.10)	(0.08)
Density	0.16*	0.12
	(0.09)	(0.07)
Peers' offending	-0.18	0.01
	(0.11)	(0.09)
Peers' victimization	0.20*	0.16
	(0.10)	(0.09)
Individual characteristics		
Interaction with peers	0.28**	0.22**
	(0.09)	(0.07)
Male	1.03***	0.62***
	(0.18)	(0.15)
White	-0.61*	-0.33
	(0.31)	(0.27)
Socio-economic status	-0.10	-0.08
	(0.11)	(0.10)
Live with two parents	0.02	-0.04
	(0.28)	(0.24)
Relationship with parents	-0.25	0.00
	(0.16)	(0.14)
High physical maturity	0.52**	0.17
	(0.17)	(0.14)
Grade point average	-0.32**	-0.32**
	(0.10)	(0.09)
Hostile school climate	0.14	0.22*
	(0.11)	(0.09)
Self-esteem	0.11	0.29**
	(0.11)	(0.10)
Depression	0.29	0.52**
	(0.17)	(0.15)
Consistent drinker	0.31	0.26
	(0.22)	(0.19)
Start drinking	0.62*	0.32
	(0.25)	(0.22)
Stop drinking	0.20	-0.23
	(0.24)	(0.21)
Consistent drug use	0.17	0.42***
	(0.24)	(0.21)

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Table 18. (cont'd)

Start using drugs	0.13	0.78***
	(0.28)	(0.23)
Stop using drugs	-0.20	0.10
	(0.25)	(0.22)
At least 11 months between interviews	-0.05	-0.11
	(0.16)	(0.14)
School-level factors		
Mean Violent offending	1.64	----
	(0.73)	
Mean Victimization	----	0.53
		(0.84)
Urban	0.05	-0.14
	(0.37)	(0.32)
Mean Hostile School Climate	0.02	-0.06
	(0.16)	(0.91)
School network density	-0.60	0.03
	(0.73)	(0.52)
Teacher-Student Ratio	-0.08	-0.21
	(0.20)	(0.16)
Mean Peer Interaction	0.77	0.29
	(0.49)	(0.42)
Intercept	-3.92	-2.56
	(0.45)	(0.36)

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2.
* p < .05, ** p < .01, *** p < .001

Summary

Overall, the group of common significant predictors for the joint probability of victimization and offending and the additional five predictors that predict offending but not victimization do not provide a clear illustration of the social process or trait underlying the victim-offender overlap. However, consistent with prior theses about the social process underlying the victim-offender overlap , the similar effects of peer group density and socializing with peers suggests that opportunity may be an important

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underlying factor.

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Chapter 6

Conclusions

Nearly every prior study of the victim-offender overlap has argued that the victim-offender overlap is, at least in part, a product of peer group dynamics. This dissertation explicitly examined how peer group characteristics influence the relationship between victimization and offending and, in doing so, extended prior research on the peers-delinquency relationship to victimization. The current research also examined how school context influences the victim-offender overlap, addressing concerns in prior studies that at least some part of the observed relationship between victimization and offending is actually due to the larger social context.

The current results clearly confirm prior findings that the relationship between victimization and offending is substantial, robust, and simultaneous. Even after controlling for characteristics of adolescent peer groups and school-context, offenders' odds of victimization were 57% higher than victims' and being victimized increased the odds of offending two-fold. The results also illustrate that peer groups do influence adolescents' involvement in crime as victims and the relationship between victimization and offending, but they do so in unexpected ways.

The current results indicate that victimization and offending are likely the result of the same or similar social processes, although they do not clearly characterize these processes. Nevertheless, the overall pattern of results do highlight the importance of adolescents' routine activities and other lifestyle factors.

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Summary of Major Findings

The current research contributes four major findings to research and theory on the victim-offender overlap. First, in addition to influencing their involvement in crime as offenders, peer groups influence adolescents' likelihood of victimization. Consistent with expectations, higher levels of victimization among their peers increased adolescents' own risk of subsequent victimization. It is likely that association with victimized peers signals to potential offenders that they are appropriate targets for victimization (e.g., they are not able to adequately defend themselves). The finding that adolescents with any experience as victims were unpopular, peripheral members of relatively small peer groups suggests that adolescents may be mindful of the risk attendant to forming friendships with victims.

Concerning peers' offending, one of the most common explanations for the victim-offender overlap is that adolescents who associate with offenders are likely to be offenders 1) because of peer group processes that pull their behavior in line with the group's and 2) to be victims because their criminal associates victimize them. The current results support only the first part of this thesis.

As the level of peer group offending increased, so too did the likelihood of adolescents' own offending, even after controlling for adolescents' prior criminal involvement as an offender. Consistent with prior research, the current results indicate that peer group processes do pull members' behavior in line with the group, and victimization does not moderate this relationship. Thus, adolescents located in peer

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groups with a high proportion of offenders or with a high level of peer group offending should be at relatively high risk for victimization. In contrast, the general pattern of the current results suggests that having violent peers actually *lowers* the likelihood of subsequent victimization.

Only one model found a significant, positive association between peers' offending and adolescents risk of victimization. Peers' offending significantly increased adolescents' risk of victimization only among adolescents who were involved in crime as offenders; among non-offenders, being part of a peer group with a high level of offending *decreased* their risk of victimization (see Model 4 in Table 12). One plausible explanation for this finding is that offenders' increased risk of victimization comes from outside the peer group. Because most adolescent offending occurs in groups, it is likely that peer group members offend together. When their victims retaliate, they target only those peer group members who were involved in the initial event. Otherwise, having friends who are 'tough' provides protection from outside threats.

The remaining models all indicated that peers' offending had either no or a negative effect on the likelihood of subsequent victimization. Although other studies have reported a positive association between peer delinquency and victimization (Lauritsen et al. 1991; Schreck et al. 2004), the negative association reported here makes sense for three reasons. First, the measure used in the current research is based on peers' own self-reports of offending, rather than adolescents' reports about their friends' offending (e.g., Lauritsen et al. 1991). Because adolescents' reports about their friends more accurately reflect their own, rather than their friends', behaviors and attitudes

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(Davies & Kandel 1981; Billy et al. 1984; Bauman & Fisher 1986; Jussim & Osgood 1989; Zhang & Messner 2000; Conway & McCord 2002), and because adolescents' own offending increases their risk of victimization, the positive association between peers' delinquency and victimization was built into the Lauritsen et al. (1991) measure. Importantly, this was a weakness of the data available at the time, it was not a factor the researchers could control.

Second, in this research peers' offending was based on serious violent offending. In the Schreck et al. (2004) study, the measure of peers' offending was based on relatively trivial offenses, such as, smoking, doing risky things on a dare, and skipping school. To the extent that having aggressive peers deters would-be offenders, the negative association between peers' offending and victimization makes sense. Although a potential offender might think twice before victimizing an adolescent whose friend has a reputation as a "scrapper," knowing that this friend "does risky things" probably does not have the same deterrent effect.

Finally, the current study controls for adolescents' own prior offending and victimization. In within year analyses, which more closely resembled the Schreck et al. models, which did not control for adolescents' prior criminal involvement, peers' violent offending was positively associated with victimization, although the effect was non-significant. The fact that adolescents' own offending accounts for the within-year effect of peers' offending on their risk of victimization highlights the fundamental importance of including offending in models of victimization risk. Not including it appears to seriously distort the effects of other variables and could lead to inaccurate conclusions

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about the nature of victimization.

The second major finding of this dissertation is the important and substantial influence on victimization on adolescents' risk for subsequent offending. Across models, the effect of victimization on offending was generally about equal to or larger than the effect of offending on victimization. Moreover, among adolescents involved in crime, 30% were both offenders and victims. These adolescents, who make up the victim-offender overlap, are responsible for committing more crime than are adolescents who are only offenders, and they are more frequently the targets of crime than are adolescents who are only victims. The current findings suggest it is not offending that is critical for understanding the negative consequences of criminal involvement, but rather offending in combination with victimization. Thus, researchers' focus on offenders and the negative consequences that frequently accompany offending seems too narrow. Research explicating the role of victimization for understanding offending appears to be as equally important as research attempting to understand how offending influences victimization.

The third major finding of the current study is that victimization and offending are likely the result of a similar underlying social process. In addition to sharing 13 of about 26 common predictors across all of the analyses, the results of the bi-variate probit analyses in chapter 5 suggest that, although distinct, victimization and offending are jointly determined by a common underlying process. The overall pattern of results does not sharply characterize this process, but it does suggest that adolescents' peer group dynamics are a meaningful component of this process.

Contrary to expectations, dense peer groups were associated with an increased

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risk of both victimization and offending. One interpretation of this finding is that cohesive peer groups (i.e., groups that are highly interconnected) efficiently disseminate information about opportunities that simultaneously increase the likelihood of victimization and offending. In addition to peers' criminal involvement and density, a third peer group factor, centrality, moderated the relationship between victimization and offending. It appears both that adolescents' position within their peer group is an important determinant of their access to information about opportunities for crime, and also that position within the peer group influences their target attractiveness to potential offenders.

The general trend across models indicated that, compared to adolescents located on the periphery of peer groups, centrally located adolescents were at lower risk for both victimization and offending. However, among offenders, being centrally located within the peer group increased the likelihood of victimization. This finding is consistent with the idea that as an offender becomes more prominent in the peer group, the benefits of victimizing him or her (e.g., increased status prestige because others are more likely to learn of the event) begin to outweigh the costs (e.g., that the target will fight back) (Singer 1981; Anderson 1999).

Fourth, the current findings that victimization and offending share a number of common predictors and probably both result from a similar underlying social process suggest that it may be possible to develop a unified theory of criminal involvement. In particular, consistent with early speculations about the social process underlying the victim-offender overlap, both peer group dynamics and adolescent routine activities

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influence the likelihood of victimization and of offending.

It is highly probable that the victim-offender overlap is embedded within peer group processes. Still, most adolescents are part of peer groups that include friendships with adolescents that have a variety of criminal experiences (i.e., are neither victims nor offenders, are victims only, are offenders only, and who are part of the victim-offender overlap). Thus, it seems that concerns about the differences between delinquent and non-delinquent peer groups are overstated. Because most peer groups include adolescents with a variety of experiences with crime, including no criminal involvement, it appears unlikely that offenders are typically members of the cold, exploitive, and detached peer groups described by some (e.g., Hirschi 1969).

It is necessary to acknowledge that, in addition to the five data limitations reviewed in chapter 2, the current research has one additional limitation, its cross-sectional illustration of adolescents' social networks. Adolescents' peer networks are often highly elastic and transient (Cairns et al. 1995), characterized by the voluntary or involuntary dissolution of friendship ties with one group and the formation of new ties, or not, with another. Thus, the results observed here may mask important peer group dynamics that influence the victim-offender overlap, and future studies using these data should identify the weaknesses and inconsistencies in the social network data collected during the second year of the study in order to use the longitudinal portion of these data.

Future Research

An important task for subsequent studies of the dynamics between peer group

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characteristics and the victim-offender overlap is to identify the patterns of intra- and inter-group crimes. Although the general expectation of research on the victim-offender overlap is that adolescents are likely to victimize other members of their peer group, especially in delinquent peer groups, the current research suggests that, at least with respect to violence, this is not case. Explicit comparisons of intra- and inter-peer group crime are needed to definitively address this discrepancy. Moreover, information about "why and when" adolescents target their friends as victims would provide considerable insight into the nature of any retaliatory processes that generate the victim-offender overlap.

Relatedly, future research should examine the situational dynamics of peer groups. The current results suggest, consistent with prior research on the victim-offender overlap, that the relationships between victimization and offending are stronger in the short-term, rather than in the long-term. Consequently, information about what happened before, during, and after the event may have the most potential for identifying the specific mechanisms through which victimization and offending influence one another.

Policy Implications

Two factors that policy makers and school administrators can influence are consistently related to both victimization and offending, adolescent peer groups and unstructured socializing. Although the victim-offender overlap appears to be rooted in the routine interactions between adolescents and their peers, peer group characteristics do not influence adolescents' risk for victimization and offending in straightforward ways.

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Policy makers should be careful in their interpretations of findings about the peers-delinquency and the peers-victimization associations. The social network perspective suggests that adolescents' involvement in crime as both victims and offenders is the result of differences in the opportunities and constraints that result from how they are embedded in their peer groups (McCarthy & Hagan 1995; Hanneman 2002) and my findings confirm that this is true. In particular, the structural characteristics of peer groups, adolescents' positions within those groups, peers' involvement in crime, and adolescents' own prior involvement in crime interact with one another to facilitate or hinder adolescents' access to information about opportunities

It would be unfortunate if policy initiatives, in an attempt to manipulate peer groups in ways that would appear to decrease the likelihood of criminal involvement as a victim or an offender, disrupted underlying peer group dynamics that are more generally beneficial for adolescents. For example, the positive effect of peer group density on adolescents' involvement in crime may reflect more complex underlying social network dynamics (e.g., the formation of cliques and reciprocated friendships) that determine members' general social standing and their ability to extract information and resources from the group.

As another example, it appears that certain combinations of peer group characteristics are especially likely to influence the likelihood of adolescent criminal involvement. Consistent with research indicating that victims are likely to be rejected by their peers, increased risk of victimization and being a part of the victim-offender overlap appears to be generally associated with being in relatively small peer groups, with being a

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peripheral member of the group, and with being in peer groups characterized by many unpopular and/or victimized members. Among offenders, however, other characteristics of the peer group condition the influence of these variables on victimization, sometimes producing the opposite effect.

All of the explicit examinations of how adolescents' network of peers influences their risk of criminal involvement have used the Add Health data (e.g., Haynie 2001; Haynie 2002; Schreck et al. 2003, and the current study). Thus, without convergent findings from analyses of other datasets, it is premature to recommend ways policy makers might attempt to influence the risk of criminal involvement for *groups*, rather than targeting one juvenile at a time.

Nevertheless, targeting interventions toward victims may well be an efficient way to simultaneously reduce both victimization and offending. That is, one potentially profitable avenue for interrupting "the cycle of violence," would be to begin by addressing victimization. Because adolescents are probably more amenable to strategies that target things they believe happen *to* them, rather than strategies that target things they *do*, adolescents are likely more open to, for example, after-school programs that structure their time during the peak hours for criminal involvement following a victimization than they are following an offense. The finding that the effect of victimization on offending appears to be stronger within years than across years suggests that interventions will be the most effective for preventing subsequent offending when they are introduced relatively soon after the victimization.

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Appendix A

Complete List of Studies Concerning the Victim-Offender Overlap

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Appendix B

Additional Interaction Models

Logit estimates — Number of obs = 2000
Log likelihood = -549.58926 — Pseudo R2 = 0.3534

Standard errors adjusted for clustering on school id

viol_d2	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	.5121254	.0872277	5.87	0.000	.3411623	.6830886
viol_d1	2.296345	.12758	18.00	0.000	2.046292	2.546397
drug_d2	.8904995	.2080485	4.28	0.000	.4827318	1.298267
lag_11	-.0766939	.0801252	-0.96	0.338	-.2337363	.0803486
male	1.017302	.1085274	9.37	0.000	.8045923	1.230012
white	-1.104591	.1257359	-8.79	0.000	-1.351028	-.8581528
age_2	-.4019134	1.186927	-0.34	0.735	-2.728247	1.924421
age_sq2	.0104085	.034484	0.30	0.763	-.0571789	.077996
ses	-.1214032	.1034997	-1.17	0.241	-.324259	.0814525
two_par	-.0269361	.2491195	-0.11	0.914	-.5152013	.4613291
hi_pd_2	.5338937	.1920919	2.78	0.005	.1574005	.9103868
p_mon2	.1464409	.1766619	0.83	0.407	-.19981	.4926918
com_par2	-.2084589	.1876909	-1.11	0.267	-.5763262	.1594085
par_cls2	-.1942189	.1559198	-1.25	0.213	-.4998161	.1113783
grade_2	-.3342119	.1193847	-2.80	0.005	-.5682016	-.1002222
hostil_2	.1134093	.1089208	1.04	0.298	-.1000716	.3268902
schatt_2	.03363	.0548058	0.61	0.539	-.0737875	.1410475
adsupp2	-.0260311	.1500788	-0.17	0.862	-.3201801	.268118
sfest_2	.1596497	.1296901	1.23	0.218	-.0945382	.4138375
depper_2	.3217664	.1529436	2.10	0.035	.0220024	.6215304
con_drnk	.3954564	.1820873	2.17	0.030	.0385719	.7523409
nw_drnkr	.6973314	.1743118	4.00	0.000	.3556865	1.038976
stp_drnk	.2836941	.1785226	1.59	0.112	-.0662037	.6335919
con_user	.1671894	.2710442	0.62	0.537	-.3640474	.6984261
new_user	.1612354	.178007	0.91	0.365	-.1876518	.5101226
stp_usng	-.1416066	.2381667	-0.59	0.552	-.6084048	.3251916
zperint2	.2793313	.0591082	4.73	0.000	.1634815	.3951812
zsr_viol1	.2065895	.0689388	3.00	0.003	.0714719	.3417071
zsr_voff1	-.1597244	.08126	-1.97	0.049	-.3189911	-.0004578
zpower	-.3352463	.1238409	-2.71	0.007	-.57797	-.0925225
z_density	.2378448	.0542942	4.38	0.000	.1314301	.3442596
zoutclos	-.0241183	.1551589	-0.16	0.876	-.328224	.2799875
zcol_sum	-.0423008	.1202372	-0.35	0.725	-.2779614	.1933599
zvoff_den1[1]	-.1822364	.0589107	-3.09	0.002	-.2976992	-.0667735
zvoff_cen1[2]	.4610282	.1404757	3.28	0.001	.1857009	.7363555
zvoff_cls1[3]	.1536587	.1979654	0.78	0.438	-.2343463	.5416638
zvoff_sta1[4]	-.0453937	.1642766	-0.28	0.782	-.36737	.2765826

1. Ego an offender by density
2. Ego an offender by centrality
3. Ego an offender by closeness
4. Ego an offender by status prestige

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Logit estimates Number of obs = 2000
Log likelihood = -554.2924 Pseudo R2 = 0.3479

Standard errors adjusted for clustering on school id

viol_d2	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	1.559707	.1670234	4.15	0.000	1.264418	1.923956
viol_d1	9.50666	1.216832	17.59	0.000	7.397346	12.21743
drug_d2	2.418092	.4944837	4.32	0.000	1.6196	3.610255
lag_11	.9308149	.0703666	-0.95	0.343	.8026297	1.079472
male	2.758807	.2736318	10.23	0.000	2.271407	3.350793
white	.3301784	.0400969	-9.12	0.000	.2602428	.418908
age_2	.7134609	.8008364	-0.30	0.764	.0790541	6.438964
age_sq2	1.008758	.0328055	0.27	0.789	.9464665	1.075149
ses	.8846183	.09448	-1.15	0.251	.7175381	1.090603
two_par	.9703434	.2423672	-0.12	0.904	.5947259	1.583194
hi_pd_2	1.695104	.3297823	2.71	0.007	1.157698	2.481976
p_mon2	1.173727	.2041976	0.92	0.357	.834604	1.650645
com_par2	.829331	.1528346	-1.02	0.310	.5779135	1.190126
par_cls2	.8144589	.1419381	-1.18	0.239	.578799	1.146068
grade_2	.7105618	.0816271	-2.97	0.003	.5673074	.8899902
hostil_2	1.116858	.1189408	1.04	0.299	.9064596	1.376092
schatt_2	1.041346	.054389	0.78	0.438	.9400204	1.153594
adsupp2	.9769902	.1505474	-0.15	0.880	.722314	1.321461
sfest_2	1.16895	.1562607	1.17	0.243	.8995195	1.519082
depper_2	1.372317	.2136265	2.03	0.042	1.011461	1.861914
con_drnk	1.419841	.248508	2.00	0.045	1.00753	2.000882
nw_drnkr	1.964429	.3398357	3.90	0.000	1.399532	2.757336
stp_drnk	1.299963	.2324022	1.47	0.142	.9157071	1.845463
con_user	1.16531	.298124	0.60	0.550	.7057919	1.924006
new_user	1.194703	.2439171	0.87	0.384	.8007076	1.782567
stp_usng	.8336262	.1834547	-0.83	0.408	.5415629	1.283198
zperint2	1.307316	.0720114	4.86	0.000	1.173528	1.456356
zsr_viol1	1.219507	.0949673	2.55	0.011	1.046883	1.420595
zsr_voff1	.8682436	.0713913	-1.72	0.086	.7390121	1.020074
zpower	.9194846	.115419	-0.67	0.504	.7189467	1.175959
z_density	1.185729	.0595923	3.39	0.001	1.074498	1.308474
zoutclos	1.075556	.148945	0.53	0.599	.8198932	1.410942
zcol_sum	.9355315	.0701719	-0.89	0.374	.807629	1.08369
znet_ccl[1]	.9715754	.0849557	-0.33	0.742	.8185524	1.153205

1. Centrality by closeness

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Logit estimates Number of obs = 2000
Log likelihood = -554.15408 Pseudo R2 = 0.3480

Standard errors adjusted for clustering on school id

viol_d2	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	1.566321	.1685439	4.17	0.000	1.26849	1.934079
viol_d1	9.536816	1.204269	17.86	0.000	7.445901	12.21489
drug_d2	2.404547	.4692809	4.50	0.000	1.640248	3.524984
lag_11	.9340892	.075439	-0.84	0.399	.7973399	1.094292
male	2.742523	.2625418	10.54	0.000	2.273342	3.308536
white	.3285577	.0420034	-8.71	0.000	.2557363	.422115
age_2	.7369979	.8220731	-0.27	0.784	.0827954	6.560336
age_sq2	1.007745	.0325166	0.24	0.811	.9459874	1.073535
ses	.8853588	.0950858	-1.13	0.257	.7173019	1.09279
two_par	.9623613	.2396453	-0.15	0.878	.590709	1.567843
hi_pd_2	1.692886	.3242662	2.75	0.006	1.16301	2.46418
p_mon2	1.180968	.2064504	0.95	0.341	.8383697	1.663568
com_par2	.834223	.1523276	-0.99	0.321	.5832495	1.193191
par_cls2	.8087391	.1391007	-1.23	0.217	.5773037	1.132955
grade_2	.7101201	.0812498	-2.99	0.003	.5674661	.8886355
hostil_2	1.119063	.1192964	1.06	0.291	.9080569	1.3791
schatt_2	1.045211	.0543898	0.85	0.395	.9438651	1.157439
adsupp2	.9748107	.1485993	-0.17	0.867	.7230425	1.314246
sfest_2	1.169972	.1560536	1.18	0.239	.900825	1.519536
depper_2	1.369152	.2150363	2.00	0.045	1.006384	1.862687
con_drnk	1.416671	.2440299	2.02	0.043	1.010752	1.985608
nw_drnkr	1.965154	.3387981	3.92	0.000	1.401674	2.755156
stp_drnk	1.294962	.2290823	1.46	0.144	.9155393	1.831626
con_user	1.162465	.2982013	0.59	0.557	.7031132	1.921915
new_user	1.184951	.2240693	0.90	0.369	.817978	1.71656
stp_usng	.8308483	.1819091	-0.85	0.397	.5409491	1.276107
zperint2	1.306453	.0716368	4.88	0.000	1.173329	1.454681
zsr_viol1	1.216537	.0966831	2.47	0.014	1.041062	1.421588
zsr_voff1	.8649257	.0710506	-1.77	0.077	.7363014	1.016019
zpower	.9376737	.1260723	-0.48	0.632	.7204532	1.220387
z_density	1.185671	.0588123	3.43	0.001	1.075827	1.30673
zoutclos	1.048497	.1535756	0.32	0.746	.7868461	1.397154
zcol_sum	.9496192	.0650483	-0.75	0.450	.8303146	1.086066
znet_cs[1]	.9531278	.054841	-0.83	0.404	.8514806	1.066909

1. Centrality by status prestige

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Logit estimates Number of obs = 2000
Log likelihood = -554.2388 Pseudo R2 = 0.3479

Standard errors adjusted for clustering on school id

viol_d2	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	1.56029	.1659202	4.18	0.000	1.266744	1.921859
viol_d1	9.519482	1.207682	17.76	0.000	7.423801	12.20676
drug_d2	2.417982	.4880516	4.37	0.000	1.627962	3.591383
lag_11	.93108	.0731547	-0.91	0.363	.7981938	1.08609
male	2.765107	.269539	10.43	0.000	2.284221	3.347233
white	.3301537	.0416242	-8.79	0.000	.2578699	.4226995
age_2	.6971964	.7901124	-0.32	0.750	.0756333	6.426834
age_sq2	1.009403	.0331166	0.29	0.775	.9465389	1.076443
ses	.885069	.0942492	-1.15	0.252	.7183471	1.090485
two_par	.9777919	.2382029	-0.09	0.927	.6065724	1.576196
hi_pd_2	1.699789	.333095	2.71	0.007	1.157687	2.495736
p_mon2	1.172497	.2020986	0.92	0.356	.836361	1.643728
com_par2	.8280564	.1545661	-1.01	0.312	.5743459	1.19384
par_cls2	.8127635	.1396787	-1.21	0.228	.5803363	1.138279
grade_2	.7105888	.0826025	-2.94	0.003	.5658096	.8924141
hostil_2	1.118677	.1190274	1.05	0.292	.9081062	1.378074
schatt_2	1.040652	.0552286	0.75	0.453	.9378452	1.154728
adsupp2	.9776821	.1503263	-0.15	0.883	.7233005	1.321528
sfest_2	1.170134	.1549642	1.19	0.235	.9026279	1.51692
depper_2	1.371967	.2157755	2.01	0.044	1.008025	1.867308
con_drnk	1.414576	.2461624	1.99	0.046	1.005776	1.989533
nw_drnkr	1.961024	.3376431	3.91	0.000	1.399348	2.748148
stp_drnk	1.294892	.2327897	1.44	0.151	.9103501	1.841868
con_user	1.168083	.2953407	0.61	0.539	.7116294	1.917315
new_user	1.189917	.2295639	0.90	0.367	.8152655	1.736737
stp_usng	.8352269	.1830715	-0.82	0.411	.54354	1.283445
zperint2	1.308149	.071727	4.90	0.000	1.174857	1.456563
zsr_viol1	1.221679	.0919005	2.66	0.008	1.054206	1.415756
sr_voff1	.8664745	.0699363	-1.78	0.076	.7396942	1.014984
zpower	.9244171	.1209507	-0.60	0.548	.7153141	1.194646
z_density	1.176542	.0659516	2.90	0.004	1.054127	1.313172
zoutclos	1.082825	.1557661	0.55	0.580	.8167922	1.435506
zcol_sum	.93459	.0731152	-0.86	0.387	.8017328	1.089463
znet_dcl[1]	.958253	.0828741	-0.49	0.622	.8088433	1.135262

1. Density by closeness

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Logit estimates Number of obs = 2000
Log likelihood = -553.57993 Pseudo R2 = 0.3487

Standard errors adjusted for clustering on school id

viol_d2	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	1.560056	.1699275	4.08	0.000	1.260154	1.93133
viol_d1	9.597595	1.206062	18.00	0.000	7.50236	12.27798
drug_d2	2.413676	.4909291	4.33	0.000	1.620127	3.595911
lag_11	.9367889	.072594	-0.84	0.399	.8047855	1.090444
male	2.728448	.2687034	10.19	0.000	2.249508	3.309359
white	.327978	.0408778	-8.94	0.000	.2568945	.4187307
age_2	.696132	.8024232	-0.31	0.753	.0726978	6.665944
age_sq2	1.009341	.0336959	0.28	0.781	.9454129	1.077593
ses	.891682	.0905038	-1.13	0.259	.7308275	1.08794
two_par	.9707879	.2365558	-0.12	0.903	.6021555	1.565093
hi_pd_2	1.703281	.3376627	2.69	0.007	1.154893	2.512063
p_mon2	1.170793	.1964197	0.94	0.347	.8427076	1.626609
com_par2	.8155393	.1529889	-1.09	0.277	.5646327	1.177942
par_cls2	.8213982	.1369392	-1.18	0.238	.5924421	1.138837
grade_2	.7095841	.0855308	-2.85	0.004	.5602773	.8986793
hostil_2	1.105315	.1171359	0.94	0.345	.8980072	1.36048
schatt_2	1.053458	.0558666	0.98	0.326	.9494602	1.168848
adsupp2	.9796683	.1510138	-0.13	0.894	.7242161	1.325226
sfest_2	1.159082	.1512653	1.13	0.258	.8974875	1.496923
depper_2	1.359457	.2164995	1.93	0.054	.9949657	1.857476
con_drnk	1.413398	.2442112	2.00	0.045	1.007375	1.983069
nw_drnkr	1.942645	.3294056	3.92	0.000	1.393346	2.708494
stp_drnk	1.290261	.2240538	1.47	0.142	.9180506	1.81338
con_user	1.16634	.2896908	0.62	0.536	.7168149	1.897768
new_user	1.195156	.2354078	0.91	0.365	.812391	1.758265
stp_usng	.8350499	.1817067	-0.83	0.407	.5451187	1.279186
zperint2	1.305026	.071744	4.84	0.000	1.171721	1.453496
zsr_viol1	1.223995	.0915974	2.70	0.007	1.057013	1.417357
sr_voff1	.8575451	.0716321	-1.84	0.066	.7280391	1.010088
zpower	.9251008	.1213859	-0.59	0.553	.715319	1.196405
z_density	1.091217	.06436	1.48	0.139	.9720912	1.22494
zoutclos	1.080411	.155676	0.54	0.591	.8145907	1.432974
zcol_sum	.9365497	.0623982	-0.98	0.325	.8219001	1.067192
znet_ds[1]	.8415187	.0895905	-1.62	0.105	.683034	1.036777

1. Density by status prestige

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Logit estimates Number of obs = 2000
Log likelihood = -553.59801 Pseudo R2 = 0.3487

Standard errors adjusted for clustering on school id

viol_d2	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
voff_d1	1.544962	.1676187	4.01	0.000	1.249015	1.911031
viol_d1	9.613862	1.194994	18.21	0.000	7.535192	12.26596
drug_d2	2.443676	.4793306	4.56	0.000	1.663716	3.589286
lag_11	.9283502	.0726308	-0.95	0.342	.7963737	1.082198
male	2.761994	.2639827	10.63	0.000	2.29017	3.331025
white	.3227932	.0416203	-8.77	0.000	.2507104	.4156009
age_2	.7558159	.8626755	-0.25	0.806	.0806991	7.078857
age_sq2	1.00696	.0333154	0.21	0.834	.9437354	1.074421
ses	.8874387	.0936552	-1.13	0.258	.721618	1.091363
two_par	.9643151	.2343402	-0.15	0.881	.5989171	1.552641
hi_pd_2	1.701346	.3327086	2.72	0.007	1.159672	2.496033
p_mon2	1.167299	.2020533	0.89	0.371	.8314644	1.63878
com_par2	.826159	.1545261	-1.02	0.307	.5726028	1.191993
par_cls2	.8174574	.1407184	-1.17	0.242	.5833618	1.145493
grade_2	.7102543	.0818155	-2.97	0.003	.566712	.8901545
hostil_2	1.109578	.1202893	0.96	0.337	.8971793	1.372261
schatt_2	1.046355	.0556592	0.85	0.394	.9427588	1.161335
adsupp2	.9725107	.1465072	-0.19	0.853	.7238728	1.306551
sfest_2	1.174162	.1588383	1.19	0.235	.9006982	1.530654
depper_2	1.388645	.2182706	2.09	0.037	1.020463	1.889666
con_drnk	1.416119	.2489665	1.98	0.048	1.003346	1.998705
nw_drnkr	1.976495	.3357125	4.01	0.000	1.416828	2.757239
stp_drnk	1.302237	.2329902	1.48	0.140	.9170586	1.849196
con_user	1.172904	.2996561	0.62	0.532	.7108786	1.935215
new_user	1.193451	.2311622	0.91	0.361	.816457	1.744519
stp_usng	.8343431	.1825139	-0.83	0.408	.5434292	1.280992
zperint2	1.303689	.0723435	4.78	0.000	1.169337	1.453478
zsr_viol1	1.221837	.0904639	2.71	0.007	1.056795	1.412653
zsr_voff1	.8664874	.0712265	-1.74	0.081	.7375514	1.017964
zpower	.9213546	.1175744	-0.64	0.521	.7174715	1.183175
z_density	1.184262	.0577153	3.47	0.001	1.076376	1.30296
zoutclos	1.065822	.1464902	0.46	0.643	.8141279	1.395329
zcol_sum	.9415273	.0595452	-0.95	0.341	.8317642	1.065775
znet_cls[1]	.8907967	.1037916	-0.99	0.321	.7089252	1.119327

1. Closeness by status prestige

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Appendix C

Negative Binomial Regression Results

To examine whether peer group characteristics influenced the extent of adolescents' victimization and offending, I estimated a series of cross-lag Poisson regression models predicting the number of different types of victimizations (e.g., being shot and being stabbed) and offenses (e.g., using a weapon, injuring someone seriously) adolescents reported being involved in. Because the distributions of these outcomes are far from normal (i.e., each has many zero values and a large positive skew) they violate the ordinary least squares (OLS) assumptions of a normal distribution and homoskedastic error variance. Moreover, using OLS to model these data could result in absurd, negative predicted values of the outcome, which is a count (Gardner et al. 1995).

Power transformations of victimization and offending are undesirable for this data. After transformation, the modal values for the counts of types of victimizations and offenses adolescents were involved in would remain at the bottom of the range (i.e., 0), and round integers are a meaningful scale for these outcomes (Gardner et al. 1995). Therefore, I analyzed the data using the Negative Binomial Poisson model. The Negative Binomial (or over-dispersed Poisson) probability distribution differs from the general Poisson distribution in that it does not assume that the variance of the dependent variable will be equal to its mean, and the model includes a random component that allows for error generated by omitted variables.

The results of these analyses are presented in Tables 15 (Types of Victimization) and 16 (Types of Offending). Model 1 in Table 15 presents the results from an analysis

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that excluded measures of peer group characteristics; and Model 2 presents the results from an analysis that includes those measures. As can be seen in Table 15, there were few differences between the logistic models predicting the odds of being a victim in year 2 and the negative binomial model predicting the odds of the variety of victimizations adolescents experienced.

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Table D-1. Cross-lag Negative Binomial Regression of Victimization Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Offending Year 1	0.19***	1.21	0.18***	1.20
	(0.05)		(0.06)	
Victimization Year 1	0.66***	1.93	0.66***	1.93
	(0.07)		(0.07)	
Sell drugs	0.35***	1.42	0.34***	1.41
	(0.09)		(0.08)	
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.09	0.91
			(0.08)	
Density	-----	-----	0.10	1.11
			(0.05)	
Closeness	-----	-----	0.09	1.09
			(0.07)	
Status Prestige	-----	-----	-0.09	0.91
			(0.06)	
Peers' offending	-----	-----	-0.02	0.98
			(0.08)	
Peers' victimization	-----	-----	0.10	1.11
			(0.08)	
Individual Characteristics				
Interaction with peers	0.15**	1.16	0.16**	1.17
	(0.05)		(0.06)	
Male	0.80***	2.23	0.80***	2.23
	(0.06)		(0.06)	
White	-0.75***	0.47	-0.67***	0.51
	(0.19)		(0.16)	
Age	0.00	0.00	0.38	1.46
	(0.53)		(0.65)	
Age squared	0.00	0.00	-0.01	0.99
	(0.02)		(0.02)	
Socio-economic status	-0.08	0.92	-0.08	0.92
	(0.09)		(0.08)	
Live with two parents	-0.16	0.85	-0.14	1.15
	(0.20)		(0.20)	
Parental supervision	0.18*	1.20	0.16	1.17
	(0.09)		(0.09)	
Communication with parents	-0.13	0.88	-0.12	0.89
	(0.09)		(0.09)	
Relationship with parents	-0.11	0.90	-0.11	0.90
	(0.11)		(0.11)	
High physical maturity	0.24**	1.27	0.25**	1.28
	(0.08)		(0.08)	
Grade point average	-0.32*	0.73	-0.31*	0.73
	(0.14)		(0.14)	
Hostile school climate	0.18	1.20	0.20	1.22
	(0.13)		(0.13)	
School attachment	0.01	1.01	-0.01	0.99
	(0.06)		(0.06)	

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Table D-1. (cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Social support	-0.11	0.89	-0.09	0.91
	(0.07)		(0.07)	
Self-esteem	0.14	1.15	0.15	1.16
	(0.08)		(0.09)	
Depression	0.32*	1.38	0.34*	1.40
	(0.14)		(0.13)	
Consistent drinker	0.21	1.23	0.21	1.23
	(0.15)		(0.15)	
Start drinking	0.51**	1.67	0.48**	1.62
	(0.17)		(0.16)	
Stop drinking	-0.01	0.99	0.02	1.02
	(0.11)		(0.13)	
Consistent drug use	0.19	1.21	0.20	1.22
	(0.23)		(0.20)	
Start using drugs	0.39*	1.48	0.39*	1.48
	(0.19)		(0.19)	
Stop using drugs	0.15	1.17	0.16	1.17
	(0.17)		(0.17)	
At least 11 months between interviews	0.02	1.02	0.02	1.02
	(0.08)		(0.08)	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2
* $p < .05$, ** $p < .01$, *** $p < .001$

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Table D-2. Cross-lag Negative Binomial Regression of Offending Year 2

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Criminal involvement				
Offending Year 1	0.49***	1.63	0.18***	1.20
	(0.04)		(0.06)	
Victimization Year 1	0.15***	1.16	0.66***	1.93
	(0.03)		(0.07)	
Sell drugs	0.36***	1.43	0.34***	1.41
	(0.10)		(0.08)	
Year 1 Peer group characteristics				
Centrality	-----	-----	-0.09	0.91
			(0.08)	
Density	-----	-----	0.10	1.11
			(0.05)	
Closeness	-----	-----	0.09	1.09
			(0.07)	
Status Prestige	-----	-----	-0.09	0.91
			(0.06)	
Peers' offending	-----	-----	-0.02	0.98
			(0.08)	
Peers' victimization	-----	-----	0.10	1.11
			(0.08)	
Individual characteristics				
Interaction with peers	0.18***	1.20	0.16**	1.17
	(0.03)		(0.06)	
Male	0.60***	1.82	0.80***	2.23
	(0.09)		(0.06)	
White	-0.42***	0.66	-0.67***	0.51
	(0.07)		(0.16)	
Age	-1.34*	0.26	0.38	1.46
	(0.61)		(0.65)	
Age squared	0.03	1.03	-0.01	0.99
	(0.02)		(0.02)	
Socio-economic status	-0.12*	0.89	-0.08	0.92
	(0.05)		(0.08)	
Live with two parents	0.17	1.19	-0.14	1.15
	(0.17)		(0.20)	
Parental supervision	-0.17	0.84	0.16	1.17
	(0.10)		(0.09)	
Communication with parents	0.06	1.06	-0.12	0.89
	(0.09)		(0.09)	
Relationship with parents	0.01	1.01	-0.11	0.90
	(0.06)		(0.11)	
High physical maturity	0.20	1.22	0.25**	1.28
	(0.11)		(0.08)	
Grade point average	-0.29**	0.75	-0.31*	0.73
	(0.09)		(0.14)	
Hostile school climate	0.19	1.21	0.20	1.22
	(0.11)		(0.13)	

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Table D-2. (cont'd)

	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
School attachment	-0.11	0.90	-0.01	0.99
	(0.08)		(0.06)	
Social support	-0.14	0.87	-0.09	0.91
	(0.14)		(0.07)	
Self-esteem	0.12*	1.13	0.15	1.16
	(0.05)		(0.09)	
Depression	0.34***	1.41	0.34*	1.40
	(0.05)		(0.13)	
Consistent drinker	0.26	1.30	0.21	1.23
	(0.16)		(0.15)	
Start drinking	0.28*	1.32	0.48**	1.62
	(0.12)		(0.16)	
Stop drinking	-0.18	0.84	0.02	1.02
	(0.11)		(0.13)	
Consistent drug use	0.32	1.38	0.20	1.22
	(0.19)		(0.20)	
Start using drugs	0.80***	2.23	0.39*	1.48
	(0.10)		(0.19)	
Stop using drugs	0.09	1.09	0.16	1.17
	(0.25)		(0.17)	
At least 11 months between interviews	-0.09	0.91	0.02	1.02
	(0.11)		(0.08)	

Note: All models control for school-level clustering of adolescents. Numbers in parentheses are robust standard errors. Unless otherwise indicated, variables are measured at Year 2
* $p < .05$, ** $p < .01$, *** $p < .001$)

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May 2001 to June 2002 — Co-PI. Weapons Use and Victimization Among Juveniles. Subgrant from the National Center for Juvenile Justice. Grant to NCJJ is from the Office of Juvenile Justice and Delinquency Prevention ($21,437 total costs).

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Publications:

Peer Reviewed Articles

Ruback, R. Barry, Jennifer N. Shaffer, and Melissa Logue. 2004. "The Imposition and Effects of Restitution Orders in Four Pennsylvania Counties." *Crime & Delinquency*, 50(2): (*In press*).

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Government Publications

Shaffer, Jennifer N. and R. Barry Ruback. 2003. The Relationship Between Victimization and Offending among Juveniles. Office of Juvenile Justice and Delinquency Prevention Bulletin

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