"DON'T FORGET THE WOMEN":
A MULTI-LEVEL ANALYSIS OF INDIVIDUAL AND CONTEXTUAL EFFECTS ON GIRLS' AND BOYS' DELINQUENCY

by

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Dana Peterson, Ph.D.

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Social disorganization theorists have long maintained that societal context is important in understanding crime and delinquency. Research has supported this assertion and offered evidence that neighborhood-level influences have not only direct, but indirect effects on individual delinquency, through more proximal spheres such as the family, school, and peer group. Little research has been conducted, however, to determine whether these factors have differential effects on girls and boys' delinquency. Some feminist scholars argue that "traditional" criminological theories cannot adequately explain females' delinquency, while other scholars assert a gender-neutral framework.

I examined these issues by testing a cross-level integrated theoretical model, combining ecological and feminist perspectives with concepts drawn from social control and social learning theories. Of particular interest was whether the integrated model was useful in predicting serious delinquency and whether it operated in similar or different fashion for girls and boys. Individual-level data from 1,536 middle-school students in six U.S. cities were combined with census tract data from students' home addresses, and HLM techniques were used to analyze these multi-level relationships.

Of five census-derived variables (mobility, unit density, overcrowding, education/occupation, and concentrated disadvantage), only overcrowding had main and direct effects on individuals' delinquency. The individual-level theoretical factors (parental attachment and monitoring, school commitment, guilt, and delinquent peer association) were not found to mediate the effects of neighborhood-level factors, but several of these variables directly influenced delinquency. None of the interaction terms between sex and the individual-level variables was significant, lending support for a gender-neutral explanation of serious offending for this age group. Residential mobility and unit density, however, did interact significantly with sex, suggesting that the relationship between these variables and serious delinquency is moderated by sex.

Limitations of this research and recommendations for future research are included. In addition, the relevance of the findings for policy-making, particularly as they pertain to gender-specific youth programming, is discussed.

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FOREWORD

Several years ago, during a meeting of European and American academics, researchers, and practitioners gathered to develop methods of studying and responding to problematic youth groups and gangs in European cities, it became clear that many group members meant their comments to apply only to males. Females were nearly absent in the discussions, as there was a belief held by part of the group that females were not part of the problem and certainly could not be gang members. Hearkening back Abigail Adams' "remember the ladies," one member finally uttered in frustration, "Don't forget the women!" This phrase became a rally cry for the group that arose each time we lost sight of the roles and experiences of girls and women in our discussions.

It is disheartening that even this group on the cutting edge of research and policy on youth issues had to be reminded not to overlook the experiences and needs of females in our research efforts and policy recommendations. I do not mean to imply that females were neglected by every member of the research network; indeed, some members' life

[1] There is some confusion about the terms "sex" and "gender" and their correct usage. In this dissertation, I use the term "sex," not to imply that delinquency differences between girls and boys are due solely to biology, but rather because I am focusing in this research more on biological categorizations of girls and boys than on gender roles. In addition, I use the terms "girls" and "boys" to refer to youths in this sample. The youths who comprise the sample used in this research are young (ages 10-14, with a mean age of 12), so I am indeed talking about "girls" and "boys" and not about young men and women.

work is focused on girls and women, and these were the colleagues who refused to let us forget. This dissertation brings girls to the forefront.

CHAPTER ONE:

INTRODUCTION

> "It is unlikely that we shall ever completely understand human behavior and social life—let alone predict it—but we must be *sensitive* to context. Doing so requires that our inquiries be guided by theoretically informed questions that are contextualized in terms of time and social location" (Short, 1998:28, emphasis in original).

Each of us exists within multiple contexts, and our behavioral choices are structured in part by these contexts (Bronfenbrenner, 1979). James F. Short, along with others who recognize the complexity of human behavior and its relation to social organization, urges criminologists to consider both the individual and the environment in our enduring study of the phenomenon of us. This dual focus has not always been central to criminology. Prior to the advent of the ecological perspective in criminology, investigations of misbehavior focused on free will or individualistic explanations. The ecological perspective promoted the idea that individuals function in their environments and that factors external to individuals help shape, even if they do not fully account for, human behavior. Although this relationship has been difficult to study, the recent development of more sophisticated analytical techniques has allowed for improved examination of ecological explanations and a more complex understanding of how contextual factors affect individual behavior. Contexts differ across locations, and different types of people can experience contexts differently. These complexities make contextual examinations a challenging and stimulating endeavor.

This dissertation engages in this very endeavor, examining neighborhood- and individual-level influences on girls' and boys' serious delinquency, and makes a unique

contribution to criminology through its joining of several related and promising strains of research. First, the past decade or so has seen the continued increase in the development and testing of integrated theoretical models, including the cross-level integrations necessary to study individual behavior within larger contexts. These integrated models have provided a more comprehensive understanding and explanation of crime and delinquency, while at the same time sparking animated discussion within the field.

Second, there is ongoing debate over whether "traditional" criminological theories are general and can explain female delinquency and male-female differences in delinquency. Although some argue for their generality, others argue these male-centered theories cannot be applied to females' behaviors, while still others believe they can be applied, but only if we also take into account the larger context that helps to structure behavior and experiences. In addition, the applicability of traditional theories to explanations of serious offending, in general, and sex differences in serious offending, in particular, are not common.

Third, there have been an increasing number of recommendations for multi-level analyses that can take into account contextual as well as individual influences on behavior. Finally, there has been growing recognition that multi-site research endeavors can greatly expand our knowledge and the applicability of that knowledge to diverse populations, situations, and contexts.

This study of serious delinquency presents a rare opportunity to combine these various research efforts, examining measures drawn from several theoretical perspectives at both individual and contextual levels and in multiple sites, collectively and separately

for females and males. Thus, this dissertation represents a combination of approaches that have been strongly suggested by many scholars, but, to date, undertaken by few due to data and/or analytical limitations.

INTEGRATED THEORIES

While some theorists, most notably Hirschi (see, e.g., 1979), contend that certain criminological theories (e.g., strain, social control, and social learning theories) cannot be integrated because their basic assumptions of human nature are at odds, others disagree. Elliott (1985:132) counters that "there is nothing inherent in this form or approach to integration that precludes the reconciliation of different assumptions." Clearly, this debate has not yet been, and may never be, resolved. Despite critics' arguments, however, there are a number of advantages of and benefits from theory integration.

For example, the common practice of testing theories against each other (the "alternative or competing hypothesis" approach) does not allow for the possibility that the hypotheses of all of the theories involved "are correct and are accounting for different portions of the variance in delinquency" (Elliott, Ageton, and Canter, 1979:20). Because different theories can complement rather than compete with each other, integrated theories hold the potential of being able to explain a greater proportion of the variance in delinquency than do single theories. Integrated theories also offer the possibility of explaining a greater variety of criminal or delinquent behavior and of offering explanations for diversity in criminal involvement across race, class, and, importantly for the present study, sex (see, e.g., Elliott et al., 1979; 1985). This dissertation seeks to add to this theoretical dialogue by analyzing a variant of an integrated model described by

Winfree, Esbensen, and Osgood (1996) and examining its ability to inform explanations of female delinquency and sex differences in delinquency.

FEMALES AND TRADITIONAL DELINQUENCY THEORIES

Most classical criminological theories have ignored females, or commented upon them as an "afterthought" (Chesney-Lind and Hagedorn, 1999). Research linking the various theoretical factors to crime and delinquency has traditionally focused on males, either white males or lower-class minority males. There is, however, growing concern with and attention to females' involvement in crime and delinquency (Chesney-Lind and Shelden, 1998). This attention has led to debate and the development of at least three general beliefs about females' crime and its study.

One group argues that male-centered theories cannot explain the experiences and behavior of females; these scholars believe that the specific context in which girls live and negotiate should be examined and female-specific theories developed. Chesney-Lind and Hagedorn argue that "girls' and women's violence needs to be explicitly studied within its social context of patriarchy" (1999:89). These authors call for greater recognition of the different experiences of girls and a development of explanations sensitive to those experiences (see also Messerschmidt, 1986). "Girls grow up in a different world than boys...[and] while both boys and girls have similar problems, girls 'have it heaps worse' (Adler, 1986)" (Chesney-Lind and Hagedorn, 1999:89). Thus, as Messerschmidt argues, "criminological theory must not universalize female crime" (1999:119). This argument poses an empirical question: Are there universal theories? Or, do girls' and boys' misbehaviors stem from different causal mechanisms? Some

scholars argue that they do not, believing instead that a gender-neutral framework can suit analyses of both male and female behavior because the same etiological factors underlie both (see, e.g., Gottfredson and Hirschi, 1990; Rowe, Vazsonyi, and Flannery, 1995). Still others argue for what might be called a "middle ground": the potential utility of traditional male-stream theories should not be dismissed outright, but should also incorporate investigation into contexts that structure gender organization and that may serve to produce sex differences even in the face of similar etiology. The latter is the approach taken in this dissertation, endorsing Miller's argument that "while gender is and should remain central to our analyses, research that overemphasizes gender differences essentializes behavior rather than understanding its complexities...we need to recognize and explore both between-gender similarities and within-gender differences, as well as differences across gender" (2001:11).

Feminist research on sex, gender, and crime must address two key issues: the "generalizability problem" and the "gender ratio problem" (Daly and Chesney-Lind, 1988:508). It is important to determine first, whether male-centered theories can explain female crime, and second, why males' rates are so high compared to females' rates, particularly for more serious offenses. This dissertation, while shedding some light on the second question, is focused on the first question and addresses Sampson's assertion: "...as Elliott et al. (1985) demonstrate, the main interest lies in the comparison of structural parameters derived from theoretically specified causal models. Whether such parameters vary by sex is the crucial question" (1985:347; see too Steffensmeier and Allan, 1996:483).

EXAMINATION OF INDIVIDUAL AND CONTEXTUAL EFFECTS: MULTI-LEVEL, MULTI-SITE ANALYSES

Although the ecological perspective on crime is no newcomer to criminology, analytical techniques to adequately assess ecological effects in conjunction with individual-level factors have been developed only recently. Lindley and Smith (1972) introduced the term "hierarchical linear models" in the 1970s, but because no approach was available for estimating covariance components in the face of unbalanced data, their contribution was not immediately realized (Bryk and Raudenbush, 1992:4). Several breakthroughs in the early 1980s allowed for the application of covariance component estimation to hierarchical data structures, such as those found in cross-level research of contextual effects on individual behavior.

The ecological perspective grew out of the Chicago School and, particularly, the work of Shaw and McKay (1942). Their social disorganization theory suggested that such neighborhood-level factors as poverty, heterogeneity, and high residential mobility influenced rates of delinquency, albeit indirectly. The work of Cattarello (2000) and others (see, e.g., Elliott et al., 1996; Gottfredson, McNeil, and Gottfredson, 1991; Simcha-Fagan and Schwartz, 1986) supports Shaw and McKay's belief that neighborhood factors influence delinquency through their effects on such mediating factors as an individual's social bonds and peer associations.

Clearly, "analysis of contextual effects requires simultaneous use of indices of social aggregates and individual behavior" (Simcha-Fagan and Schwartz, 1986:694). These authors argue that considering only direct effects of community characteristics on

delinquency oversimplifies the relationship since their research indicates that such effects are in large part mediated by youths' socialization experiences (see too Larzelere and Patterson, 1990; Sampson and Laub, 1994; Stern and Smith, 1995).

Adequately measuring these multi-level relationships requires the use of statistical techniques, such as hierarchical linear modeling (HLM), that are suited to the analysis of nested data. Hierarchical or nested data structures violate the assumptions of ordinary least squares regression because observations are not independent of each other; for example, students within classrooms or individuals within neighborhoods are likely to be more similar to each other than students or individuals in other contexts and to share values on contextual variables. Because not all variables will be observed, these shared values will be captured in the error term, producing correlation between disturbances, a violation of OLS assumptions. HLM is a class of models that takes into account multiple levels in a variety of research problems (Bryk and Raudenbush, 1992).

Use of hierarchical linear modeling techniques has recently appeared in group- or individual-level change studies (e.g., Bursik and Grasmick, 1992; Jang, 1999), and also in multi-level studies of such phenomena as victimization (Rountree et al., 1994); drug use (Jang and Johnson, 2001); and victimization and misbehavior in schools (Anderman and Kimweli, 1997; Welsh, Greene, and Jenkins, 1999). Few delinquency studies to date have been located that have an advantage over other studies of contextual effects on individual behavior in their use of hierarchical linear modeling to test relationships (see e.g., Cattarello, 2000; Elliott et al., 1996). By employing HLM, this dissertation adds to this sparse literature.

Analysis of contextual effects in multiple sites has an advantage over single-site analyses in robustness and generalizability of findings. Responding to their critics, Gottfredson and her colleagues argue that "(b)ecause previous multilevel studies have been limited to studies of a single city, we thought that a study of many different types of areas would add more to the literature than another study of a single city" (1991:218). I agree. In previous work, Esbensen and Lynskey (2001) recognized the importance of community variation in the comparison of youth gang members in eleven different sites. In addition to inter-community differences, intra-community variation should also be expected. Cities are not homogenous entities. There are variations not only in demographic characteristics of citizens, but also in such conditions as housing, employment, poverty, education, mobility, and public services—all of which should provide variation in the nature of contextual factors experienced by adult residents and, particularly, youths who reside in different locations within a city. Because intra-community variation is expected, examination of city-level characteristics can mask important differences in factors that influence youths' behaviors and will tell little about the types of relationships that can be expected between various contextual effects and individual behaviors. To provide greater contribution to existing theory and research, data from six cities are analyzed in the dissertation, which increases the diversity of contexts and variability on the neighborhood-level variables.

This dissertation uses both individual-level and census data. Two waves of data from the longitudinal portion of the National Evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program provide the individual-level measures.

The sample consisted of 2,045 youths in six sites across the U.S. These data were linked with contextual measures from the 1990 Census of Population and Housing (U.S. Census Bureau, 1992) for the census tracts in which the individual respondents resided. The nested nature of the data, i.e., individuals are nested within census tracts, can cause correlation among error terms. Thus, hierarchical linear modeling will be used to decompose effects both within and between neighborhoods.

PROJECT SIGNIFICANCE AND CONTRIBUTION

This research project provides a test of the ability of traditional delinquency theories in an integrated theoretical model to explain females' as well as males' delinquency. In contrast to other studies that use small or single-sex samples, this study has the advantage of a large sample that is evenly split by sex. Whether similar or disparate factors relate to girls' and boys' delinquency is an important question, given the recent push for gender-specific juvenile justice programming. This push has been tied in part to the 1992 reauthorization of the Juvenile Justice and Delinquency Prevention Act that included a mandate and challenge grants for states to assess their prevention and treatment services for females and to develop plans for their provision and/or improvement (42 U.S.C. 5631 Section 223 [8] [B] [i-ii]; Section 285 [B] [2] [E]).

There has been increased media, public, and political attention to serious, violent, and chronic offenders in the past decade or so (Chesney-Lind and Shelden, 1998). Unfortunately, this has led to legislative and programmatic shift in emphasis from the needs of female offenders to the "problem" of serious, violent, and chronic offenders (Kempf-Leonard and Sample, 2000; Shelden, 1998). Contemporary females are seen as

more violent and more serious offenders than their predecessors, and there is a call for harsher treatment (although this is not limited to females). Thus, at the same time that many feminist scholars are arguing for less restrictive and gender-specific outcomes for females (e.g, Acoca, 1999; Chesney-Lind and Shelden, 1998), juvenile justice system officials and the public alike are caught up in the movement toward harshness of punishment.

To determine whether gender-specific or gender-neutral programs are necessary, we must first explore whether the reasons for girls' delinquency differ from boys'. As Kempf-Leonard and Sample observe, "Most recommendations fail to explain why the program elements for girls are any different from elements appropriate for boys...life at the social and economic margins is problematic for all who live there, but the ways in which it is gender-specific—or how juvenile justice could help youths with those troubles—are still unclear...(thus) it is difficult to understand how good *female-specific* services differ from good *youth* services" (2000:118, emphasis in original). Explicating the factors associated with delinquent behavior can inform this debate over whether gender-specific or gender-neutral services and programs are appropriate. Because few studies have been done on serious offending by both girls and boys, this study can inform research and policy as to the factors related to serious delinquency that are similar and different for girls and boys.

The data for this study are drawn from six sites, resulting in a geographically, contextually, and racially/ethnically diverse sample. This is important in that much current research is based on single site samples, thus limiting the robustness and

generalizability of findings. The diverse sample allows for examination of delinquency and its predictors across multiple social contexts. Linking individual-level data with census data allows for examination of contextual effects. Accordingly, this study adds to the small but growing body of knowledge about how ecological factors influence individuals and may account for some of what appear to be individual differences in behavior. There are few other studies with adequate samples in multiple cities with which census data may be linked. In addition, the analytical technique is one whose use, although appropriate to research endeavors examining contextual and individual effects, has been relatively rare in criminology; use of hierarchical linear modeling techniques avoids the problems associated with the violation of OLS regression assumptions and permits more confidence in this study's findings.

The following chapter provides an overview of integrated theory development and the surrounding debates that have occurred, argues the need for integrated theory, and describes the integrated model on which this study's model is built. Chapter Three describes the relevance of the feminist and ecological perspectives, social control, and social learning theories for the proposed integrated model. The study's research design and analytical plan, including the appropriateness of multi-level analyses, are described in Chapter Four. Results and conclusions from the analyses are discussed in Chapters Five and Six.

CHAPTER TWO:

INTEGRATED THEORIES

This chapter outlines the development of and need for integrated theoretical models, as well as the debates surrounding this theoretical work. Limitations of research on integrated models are discussed in the context of what the proposed dissertation will add to the field. At the end of the chapter, the integrated theoretical model upon which this dissertation will build is presented and the proposed variations on this model described.

Liska, Krohn, and Messner define theoretical integration as "an activity that involves the formulation of linkages between different theoretical arguments" (1989:2). They go on to state, "Theoretical integration is best viewed as *one means* of theorizing—i.e., as one strategy for developing more cogent explanations and for promoting theoretical growth" (1989:2, emphasis added). Thus, integration is but one avenue for theoretical development. Of course, not all scholars agree on the utility of such an approach, and a spirited debate, discussed later, has ensued.

Theory evaluation has been described as "the process of determining the philosophical, logical, conceptual, and empirical utility of a theory" (Winfree and Abadinsky, 1996:347). In addition to theory integration, theories may be evaluated by testing the individual theory ("crucial tests"), or by testing theories against each other to determine which holds the most predictive and explanatory value ("theory competition" or "alternative tests or hypotheses"). Travis Hirschi is one scholar who believes that the alternative hypotheses approach, not integration, is the appropriate strategy for advancing

theory. Hirschi and others (e.g., Kornhauser, 1978) contend that certain criminological theories (e.g., social control, social learning, and strain theories) cannot and should not be integrated because their basic assumptions of human nature are at odds: Social control theories begin with the premise that humans are hedonistic and prone toward deviance in the absence of controls, while social learning theories propose that humans are a "blank slate" and that all behavior, normative or deviant, is learned. Strain theories presume humans to be innately good, requiring a push toward deviance by structural factors and obstacles.

Other scholars argue that our ability to explain human behavior is only enhanced by the integration of concepts and propositions. For example, Elliott, one of the most noted and vocal proponents of integrated models, counters that "there is nothing inherent in this form or approach to integration that precludes the reconciliation of different assumptions" (1985:132). Elliott (1985) makes several arguments against the common practice of testing theories against each other and in favor of integration. First, he says, individual criminological theories have rarely provided precise and testable hypotheses, and research on alternative hypotheses rarely finds definitive results touting the value of one theory over another (Elliott, 1985:125). Second, individual theories are generally weak in terms of explained variance. As Elliott and his associates (1985) note, even the most robust criminological theories have generally accounted for less than ten to twenty percent of explained variance in individual criminal behavior. Further, the alternative hypothesis approach fails to consider the possibility that the hypotheses of both, or all, of the theories involved "are correct and are accounting for different portions of the variance

in delinquency" (Elliott, Ageton, and Canter, 1979:20). Because different theories can complement rather than contradict each other, integrated theories hold the potential of being able to explain a greater proportion of the variance in delinquency than do single theories. Integrated theories also offer the possibility of explaining a greater variety of criminal or delinquent behavior and of offering explanations for diversity in criminal involvement across race, class, and sex (see, e.g., Elliott et al., 1979).

Not everyone agrees that the alternative hypothesis approach is the problem, or that theory integration is the solution. Meier, for example, believes that typologizing and theory integration is what occurs "when there is little else to do theoretically" (1989:201). He argues that, instead, we should further develop and conceptualize existing theories. Similarly, Liska, Krohn, and Messner address Elliott's argument that existing theories lack clear-cut hypotheses; they contend that this deficiency points to the "need for greater precision in the statement of these theories" (1989:4).

Bernard and Snipes (1996:321) argue that there are too many criminological theories and that the practice of testing theories against each other has resulted in lack of progress in the field. These authors argue that theoretical integration is not impossible and that rather than being an alternative to the competing hypotheses approach, integration is a supplement. They are careful to note, however, that any integrated theory "must accurately represent the essential arguments of their component theories" (1996:321). They also assert that incompatible theoretical propositions cannot be integrated. Although this latter argument supports Hirschi's claims, Bernard and Snipes (1996:321-22) further argue that Hirschi himself as well as Kornhauser (1978) have

misrepresented the basic assumptions of strain and cultural deviance theories, and thus, Hirschi's claims of their incompatibility with control theory are unfounded. "Once those distortions are corrected, the theoretical incompatibilities largely disappear" (Bernard and Snipes, 1996:322).

TYPES OF INTEGRATION

Liska, Krohn, and Messner identify three strategies for integration: conceptual integration, theoretical elaboration, and "small" or "middle-range" integration (1989:15-17). In conceptual integration, similar concepts from different theories are equated, with the thought that even if the terms applied to them are different, their meanings are similar (Liska et al., 1989:15). This argument is that the process of equating concepts across theories may make propositional integration less difficult. Theoretical elaboration, advocated by Thornberry and others, involves fully developing what are believed to be under-developed existing theories; thus, rather than engage in integration, we would do well to fully explicate extant theories (see also Meier, 1989). In small or middle-range integration, propositions and concepts from different theories are linked together, but it is not necessary that complete theories be integrated (Liska et al., 1989:17). Bernard and Snipes too maintain that "an integrated theory of crime does not necessarily need to maintain intact *all* of the propositions of the component theories" (1996:322). This strategy is relevant for the integrated model proposed in this dissertation, which combines propositions and concepts of several theories, but does not include all of the theories' propositions or concepts. Liska and his colleagues (1989) suggest that the middle-range

approach of combining concepts from various theories, but not the complete original theories, is an appropriate method of integration.

Propositional integration can be achieved in one of three ways described by Hirschi (1979). First, partial theories can be laid end to end so that their propositions describe a causal order or developmental sequence. Second, theories can be laid side by side and cases divided according to which types of deviants or which types of deviance each theory best explains. Finally, in up-and-down integration, the level of abstraction of one partial theory is raised so that its propositions become part of a larger general theory. The theoretical model that frames this dissertation can be considered an end-to-end integrated model; as will be described in Chapter Three, however, the developmental sequences are not the focus of the dissertation and will be examined in later research.

CROSS-LEVEL INTEGRATION

Bernard and Snipes argue that "Hirschi's social control theory may attribute independent variation to individual characteristics, to social structure, or to both" (1996:336). They maintain that individual-level variation and structural variation theories do not inherently exclude the explanatory propositions of the other. In regard to structural variation theories, Bernard and Snipes (1996) argue that because most individuals in criminogenic environments do not engage in criminal behavior, these theories must allow for individual-level variation. Similarly, individual difference theories do allow for structural variation, such as "structurally generated changes in criminal opportunities" (Bernard and Snipes, 1996:337).

Not all scholars agree that macro- and micro-level theories can and should be integrated. Kornhauser (1978), for example, believes that macro- and micro-theories "cannot be reconciled and that such efforts are always and everywhere condemned to fail" (Meier, 1989:200). Bursik, however, argues that group- and individual-level factors can be seen as "complementary components of a comprehensive theory of crime" (Bursik, 1988:523). Those who engage in cross-level integration believe that "within-person variation, variation in social structure, and variation in person-structure interaction, all affect individual behavior" (Bernard and Snipes, 1996:319). Because the model assessed in this research includes both neighborhood- and individual-level theoretical predictors, cross-level integration is the appropriate term to apply.

CONTRIBUTIONS OF INTEGRATED MODELS

Over the last century of criminological theorizing, integrated models have become more and more common. In fact, even early theories such as social disorganization could be described as integrated. A few decades later, Cloward and Ohlin (1960) combined strain and social learning theories in their theory of differential opportunity. By the 1970s, integrated models had become fairly common, and a variety of models, integrating a variety of theories, have been proposed. For example, some have combined social control and social learning (Thornberry, 1987), others class variables and control variables (Colvin and Pauly, 1983; Hagan, Simpson, and Gillis, 1985; 1987), and still others social control, social learning, and strain concepts (Elliott, Ageton, and Canter, 1979; Elliott, Huizinga, and Ageton, 1985). Additionally, scholars have integrated concepts and propositions of more than three theories (e.g., Braithwaite, 1989; Johnson,

1979). These integrations have furthered the study of crime and delinquency in a number of ways, including identifying different pathways to crime (e.g., Moffitt, 1993; Thornberry, 1987), suggesting differential effects of theoretical factors for different types of people or different types of crime (e.g., Elliott, Ageton, and Canter, 1979; Elliott, Huizinga, and Ageton, 1985; Johnson, 1979), and proposing that different variables are important at different times during one's life (e.g., Moffitt, 1993; Sampson and Laub, 1993; Thornberry, 1987).

Thornberry's (1987) interactional theory combines control and social learning theories to explain delinquency. His central premise is that such factors as social bonds and associations with peers have reciprocal relationships with delinquency; for example, attachment to parents may influence involvement in delinquency, but a youth's involvement in delinquency will also influence affective ties with parents. Thornberry also incorporates class as an influencing factor: lower-class youths are thought to have weaker bonds and to be more likely than other youths to adopt delinquent values and associate with delinquent peers, compared to middle-class youths who are thought to be more strongly bonded due to a stronger family structure. Longitudinal tests of the theory indicate that nonrecursive models are more appropriate for the study of delinquency than unidirectional models (e.g., Thornberry, Lizotte, Krohn, Farnworth, and Jang, 1994). These tests also show how propositions of social control and social learning theories can be integrated to complement each other.

Developmental models, such as Sampson and Laub's stability and change model and Moffitt's life-course perspective, also combine key aspects of several theories.

Social structural, social control, and social learning factors are integrated in Sampson and Laub's (1993) developmental model to explain within-individual change over time. Their re-analysis of the Gluecks' (1950) data confirmed the Gluecks' results regarding the significance of family process, which was the most important factor distinguishing delinquents from non-delinquents. Their research, however, also highlighted the importance of school and peers in influencing stability of or change in behavior over time, suggesting an integrated developmental model. Moffitt (1994) asserts that different etiologies underlie the trajectories of "adolescent-limited" and "life-course-persistent" offenders. Her research indicates that factors such as neuropsychological deficits precede antisocial behavior in life-course-persistent offenders, while social mimicry (see social learning theory's concepts of imitation and differential reinforcement) is a key explanatory factor for adolescent-limited offenders. Developmental theories such as these support the utility of integrated models, highlighting the differential importance of various influencing factors throughout the life-course.

The power-control theory developed by Hagan, Simpson, and Gillis (1985, 1987) can be considered a cross-level integration (Bernard and Snipes, 1996). These authors combine class structure with family control variables to explain male-female differences in delinquency. As will be discussed in Chapter Three, empirical support for this theory has been mixed. Similarly, Colvin and Pauly (1983) combine social class and workplace coercive control with social control, opportunity, and social learning to explain how parents' position and experiences in the workplace influence socialization of children and children's relationships with family, peers, and in school. Type of socialization

determines how strongly bonded youths are to their families, which in turn influences the youths' school experiences, delinquent peer associations, and delinquency. One test of this structural-Marxist theory provided limited support: although the link between parents' work position and socialization practices was found to be weak, parenting practices that produced weak bonds did increase delinquent behaviors (Messner and Krohn, 1990).

Elliott and his colleagues (1979, 1985) suggest that strain, social control, and social learning variables can be integrated in an end-to-end model to explain delinquency and drug use. In general, they found that strain and social control variables had no direct effects on delinquency and that the most important predictor was association with delinquent peers. As Bernard and Snipes argue, however, since Elliott, Huizinga, and Ageton (1985) altered one of social control theory's arguments, their theory "cannot be considered an 'integration' that includes control theory" (1996:321). Elliott and his associates found it necessary to take into account the *type of group* to which an individual bonds (1985:38), while Hirschi maintains that the type of group is less important that the bond itself. Overall, the variables in their integrated model appeared to operate in a similar fashion for both females and males; however, each of the models explained a lesser proportion of the variance in delinquency outcomes for females (Elliott et al., 1985:111-16). The largest differences in explained variance were for index offenses (R^2 = .11 for females and .37 for males) and hard drug use (R^2 = .14 for females and .50 for males). For general delinquency (.43 versus .54), minor offenses (.33 versus .41), and marijuana use (.55 versus .62), the model explained variances were more similar for girls

and boys. In addition, the proportion of explained variance for these integrated models is much higher than the ten to twenty percent generally accounted for by single theories.

In his study of delinquency, Johnson (1979) integrated social class, strain, attachment to parents and school (social bonding), association with delinquent peers and adoption of delinquent values (social learning), and perceived risk of apprehension. Consistent with other research on integrated models that include social learning theory, delinquent peers and delinquent values were among the strongest predictors, along with school experiences. The proportion of explained variance was similar for both white females (.28) and white males (.30), although some differential effects were found. School attachment and delinquent values were more influential for girls' than boys' delinquency; and school performance, perceived parental love, attachment to parents, susceptibility to peer influence, delinquent peers, and perceived risk of apprehension were more important for boys' than girls' delinquency (Johnson, 1979:124). As with studies conducted by Elliott and his associates, Johnson's integrated theory reveals some differential effects by sex, as well has a higher proportion of variance explained than found in research of single theories.

Importantly, these integrated models and related research support the idea that focusing on a single theory of causation limits our study of delinquency. Rather than being alternatives, theories can complement each other and provide a more comprehensive understanding of criminal behavior. Each theory adds an important piece of the puzzle, allowing us to better identify important causal factors in childhood,

adolescence, and adulthood, and for different types of crime and different types of people.

LIMITATIONS OF RESEARCH ON INTEGRATED MODELS

Many integrated models have been shown to provide greater explained variance than single theories, enhancing our understanding of delinquency. Tests of these integrated models, however, have been limited in a number of ways. First, with few exceptions, they have not been tested using a multi-level approach. Tests, even of macro-micro integrations, have generally been at the micro-level, with few attempts to merge macro-level variables. This is unfortunate, given that Liska and his colleagues maintain that "cross-level integration...is sometimes thought to be both the most difficult and perhaps the *most necessary* type of theoretical integration" (1989:13, emphasis added). Also important for the current study is their contention that "end-to-end integration of micro and macro-level theories is both possible and desirable" (1989:14); Liska and his colleagues lament the lack of studies that examine causal links between contextual and individual factors in such an end-to-end integrated model.

A significant factor in the lack of macro-micro tests has been the inadequacy of analytical techniques. With the advent of hierarchical linear modeling techniques, such analyses are now possible and gaining in popularity. This dissertation uses Bryk, Raudenbush, and Congdon's (2000) Hierarchical Linear Modeling (HLM) 5 statistical package to assess an end-to-end macro-micro integrated model, testing in part "the degree to which the HLM models live up to their high degree of promise" (Bursik and Grasmick, 1996:250).

A second limitation of previous research on integrated theories that this dissertation will address is that there have been few tests of the power of integrated theoretical models to explain females' as well as males' delinquency. Tests of integrated models have revealed that "the ability of a given model to explain behavior varies with the type of behavior in question" (Brown, Esbensen, and Geis, 1996:369). It is reasonable to believe that results may also differ across demographic characteristics such as sex, particularly by crime type (see, e.g., Elliott et al., 1985). The study described in this dissertation overcomes these two limitations by including macro-level variables in a test of an integrated model's applicability to both male and female delinquency.

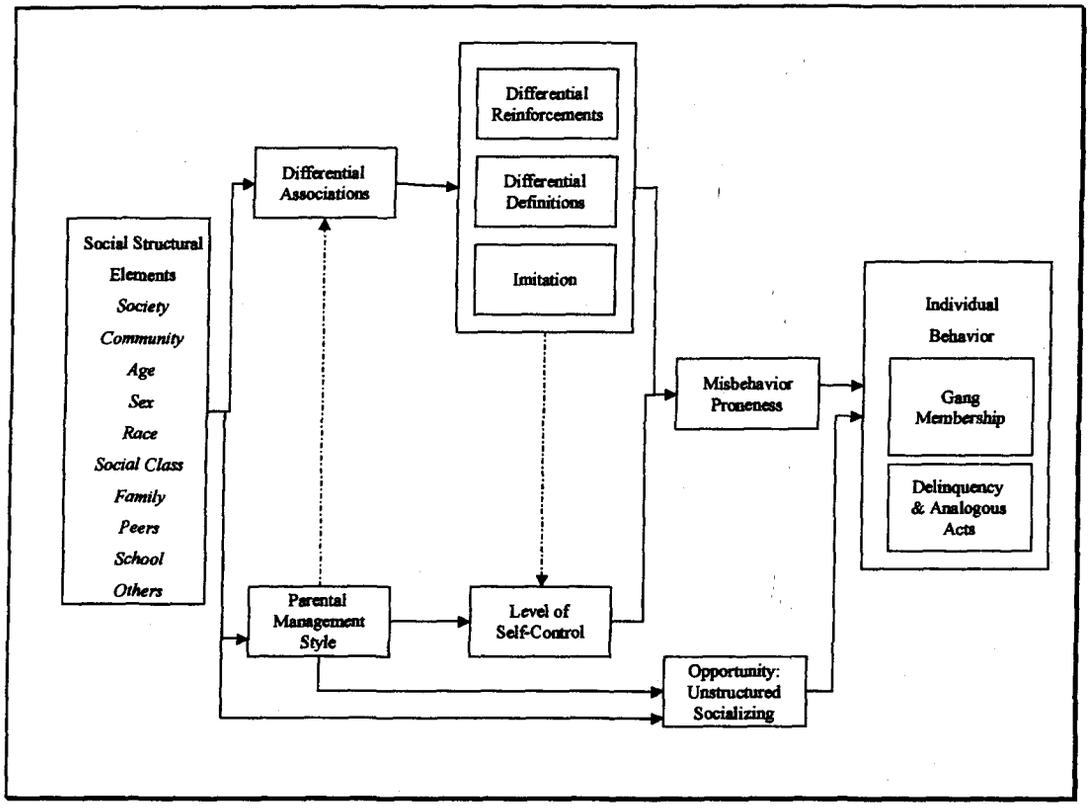
PROPOSED THEORETICAL MODEL

The present study will add to this theoretical dialogue by analyzing a variant of an integrated model developed to frame the National Evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program and described by Winfree, Esbensen, and Osgood (1996). This model integrates social structural factors with concepts and propositions drawn from self-control, social learning, and routine activities/opportunity theories (see Figure 2.1).

The model depicted in Figure 2.1 contains no direct links between social structural factors and individual behavior. Rather, these factors are thought to influence the types of peers available for associations and the ability of parents to effectively manage and socialize their children (Winfree et al., 1996). Social learning theory's contribution in the top half of the model hypothesizes that social structural elements influence the types of groups that are available to youths for association. In contact with

these peers, a youth will experience reinforcers and punishments, definitions of behaviors as good or bad, and behavior that may be imitated.

Figure 2.1. Winfree, Esbensen, and Osgood's (1996) Integrated Theoretical Model



Depending on the direction of these influences and learning processes, the youth will exhibit either delinquency- or conformity-proneness which, when coupled with an opportunity for misbehavior, will determine whether the youth engages in that misbehavior. In the bottom half of the model (representing self-control theory's contributions), social structural elements are also thought to inhibit parents' ability to exercise effective parental management, which in turn may result in low levels of self-control in children. Youths with low self-control, when presented with an opportunity for

deviance, are more likely to engage in misbehavior than youths who have been properly socialized and exhibit high levels of self-control.

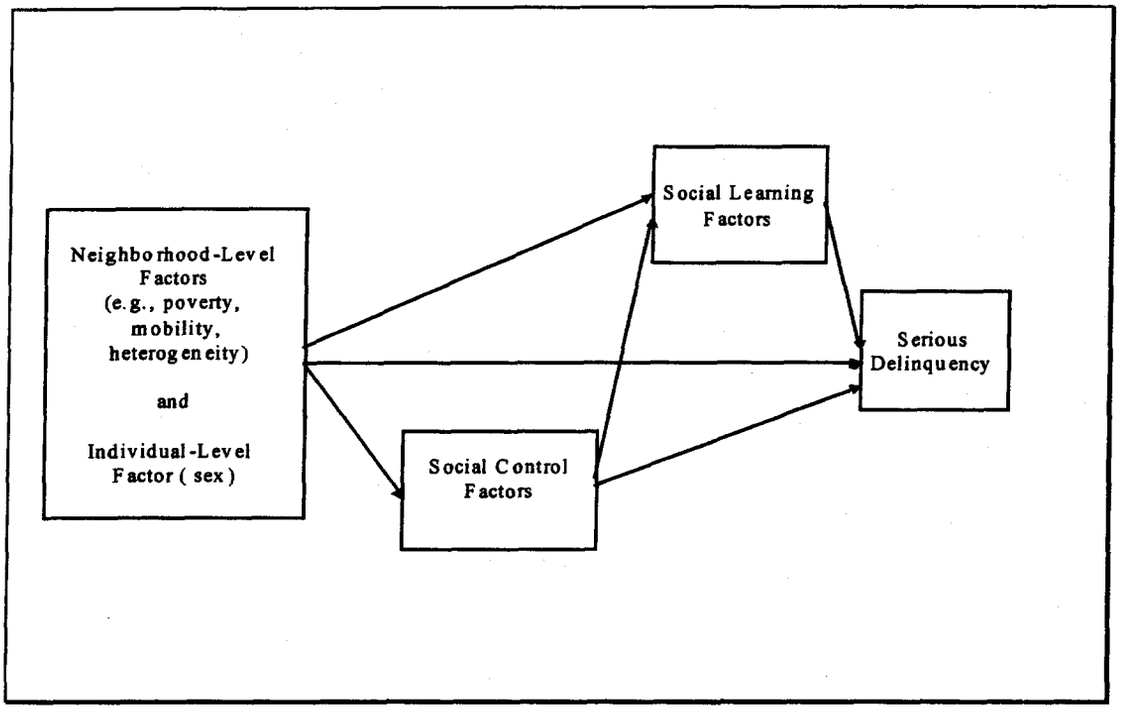
In addition, Winfree and his colleagues added two deduced links (see dashed arrows). First, poor parental management in the home may lead youths to seek out alternative sources of definitions, reinforcements, and associations and may also expose them more often to unsupervised, unstructured socializing with peers. A second link is added between learning theory processes and level of self-control, suggesting that certain types of reinforcements, definitions, and imitation will affect a youth's level of self-control (Winfree et al., 1996:197).

Winfree and his colleagues acknowledge both Hirschi's belief that social control and social learning theories cannot be integrated and Akers' belief that social learning subsumes other theories. These authors explicitly state that they were not offering "a new theoretical model for the study of youthful misconduct," but rather "only an evaluation model for (the G.R.E.A.T.) program" (Winfree et al., 1996:198, note 1). By contrast, it is my intention to adapt this model into a testable explanation for girls' and boys' delinquency.

With some modifications, the above integrated model provides the framework for the dissertation (see Figure 2). As mentioned previously, combining group- and individual-level dynamics can provide a more comprehensive theoretical approach (Bursik, 1988). In the model to be tested in the dissertation, the social structural community elements are more fully developed and sex is highlighted as a key influencing

factor; as will be discussed later, the routine activities or opportunity element that is present in Winfree et al. (1996) is not independently assessed in the proposed model.

Figure 2.2. Proposed Integrated Model



In this integrated model, it is argued that neighborhood-level factors will have some total and/or direct effects, however small, on girls' and boys' delinquency. Much of the influence of these factors, however, will be mediated through more proximal influencing factors from the domains of the family, school, and peer group by processes described in social control and social learning theories. Further, sex is considered a moderator of these factors; that is, these theoretical factors will operate differently for females and males. As Winfree and his colleagues (1996) have demonstrated in their integrated model, the argument can be made that factors drawn from the routine activities or opportunity perspective will also play a role in mediating neighborhood effects and in

directly affecting individual delinquency. Because the routine activities/opportunity measure may be confounded in the current research with the effects of parental monitoring and delinquent peer associations (see Chapter Four for descriptions of these variables), this measure is omitted from the dissertation, but will be explored in later research.

Thus, this proposed model, and the full model proposed in Chapter Three, adds two dimensions to the model in Figure 2.1: a macro-level and a gendered perspective. It is important to point out that Figure 2.2 describes a conceptual theoretical model, and that the model depicted will not be fully tested in this dissertation in terms of the pathways to delinquency. The focus of the dissertation, rather, is on the effect of the neighborhood-level factors on individual delinquency and on whether variables drawn from social control and learning theories intervene in this relationship. The theories from which this study's constructs and propositions are drawn are discussed in the following chapter in the context of their contribution to the proposed integrated model.

CHAPTER THREE:

REVIEW OF THEORETICAL COMPONENTS AND RELATED LITERATURE

The present study examines contextual and individual effects on serious delinquency, with an eye toward providing insight into both girls' and boys' behaviors. The proposed theoretical model described in Chapter Two (see Figure 2.2) is an integration of constructs and propositions drawn from several theoretical perspectives: the feminist perspective; the ecological perspective, in particular, social disorganization theory; social control theory; and social learning theory. This chapter describes these theories through the lens of the feminist perspective, provides an overview of the current state of empirical knowledge about girls' and boys' delinquency gained from tests of these theories, and integrates their theoretical concepts and propositions into a testable model that is described and depicted at the end of the chapter.

TOWARD A FEMINIST APPROACH

As introduced in Chapter One, ideas about girls' and boys' delinquency have fluctuated over the years. When females were considered at all in historical treatments, their behaviors were thought to have separate causes than boys' behaviors. The idea of separate causes was reflected also in the later development of feminist theories. By contrast, research in the 1970s, '80s, and '90s touted the utility of a gender-neutral framework for delinquent behavior. Other current research suggests examining the efficacy of traditional delinquency theories, but also recognizing their deficits in the face of the constraints and influences of societal gender structures on girls' and women's opportunities and behavior.

Historical Theoretical Treatment of Females

As many scholars have noted, female crime and delinquency for the most part has historically been ignored; and those early scholars who did focus their attention on females generally emphasized the role of biology and sexuality in females' behaviors that overstepped their societal roles (Chesney-Lind and Shelden 1998; Shoemaker 1990; Smart, 1979). For example, Lombroso and Ferrero (1895) characterized females who engaged in crime as having masculine traits coupled with the worst of females' traits, and suggested that their crime was often the result of a preoccupation with sexual matters. These ideas set the tone for later theoretical work that posited males' crime to be the result of numerous external factors, while females' crime was tied to their sexuality and traditional stereotypes (Chesney-Lind and Shelden, 1998:75; Smart, 1979).

Much of the later theoretical work has either failed to recognize and include females or has viewed females' delinquency as simply an extension of males' delinquency (Shoemaker, 1990). The ecological approach that emerged out of the Chicago School, as well as strain and class-based theories, differential association and learning theories, and control theories, focused almost exclusively on male delinquents. When females were mentioned by theorists and researchers of these perspectives, it was often to dismiss their delinquency involvement as minor, unimportant, and not worthy of study (see, e.g., Cloward and Ohlin, 1960; Cohen, 1955; Hirschi, 1969; Merton, 1938; Shaw and McKay, 1942).

The female-oriented theories that emerged in the 1950s, 1960s, and, particularly, the 1970s provided a sex- or gender-role explanation of females' crime, but these too

were hindered by stereotyping (Chesney-Lind and Shelden, 1998; Shoemaker, 1990). For example, the increase in females' labor force participation and the concurrent liberation from the traditional domestic-sphere roles was believed to have caused an increase in females' crime participation (Adler, 1975). At least two mechanisms were noted: first was the belief that females had begun to imitate males' delinquency and gang involvement; and second was that liberation from traditional roles had created confusion and turmoil that, coupled with the general stress brought on by adolescence, resulted in greater delinquency for girls (Adler, 1975:95). However, both official and self-report data show that although there has been a rise in females' delinquency over the past 30-40 years, most of this increase occurred prior to the women's liberation movement in the 1970s (Chesney-Lind and Shelden, 1998; Curran, 1984; Shoemaker, 1990; Smart, 1979). Shoemaker notes that there is no evidence that "connects rising female crime rates with rising levels of industrial and socioeconomic development" (1990:261). These early "liberation = delinquency" claims were simply based on misleading interpretations of crime statistics (Curran, 1984; Smart, 1979). Further, Leiber and his associates (1994) found a lack of support for their hypothesized interaction between females' liberation and strain. Females' liberated attitudes had little effect on delinquency; strain, although more often present among males, operated in the same manner for both females and males, regardless of the presence of liberated attitudes.

Feminist Theory

Early feminist scholars contended that traditional theories of delinquency, developed by male criminologists to explain male deviance, could not adequately explain

females' delinquent behaviors. Thus, some have endeavored to develop feminist theories of crime. The theories that fall under this umbrella all view gender inequality and discrimination as key factors in organizing behavior including female crime, but each views the mechanisms by which they operate, and the appropriate response to be taken, differently.

In their explanations of female crime, liberal feminists (see Adler, 1975, for example) argue that females imitate males in their reasons for involvement in crime; that is, similar to males, they engage in crime for such reasons as money, power, and status (Wing and Willis, 1997:246). Females strive to overcome gender discrimination and inequality by imitating males' behaviors, and it is this "merging" of gender roles that results in more female crime. Liberal feminism holds that gender discrimination and inequality can be overcome through institutional change—change from within the system (Einstadter and Henry, 1995).

Radical feminists argue that girls' criminal involvement is the result of their physical and sexual victimization and exploitation by men (Chesney-Lind, 1989; Wing and Willis, 1997:246). This perspective views gender inequality and females' subordination to be a result of patriarchy, a systemic problem that cannot be solved from within; it requires replacement of structures and institutions. Similarly, Marxist feminists recognize the role of patriarchy, but see sex and gender relations as rooted in class relations that allow for subordination of women and minorities (Einstadter and Henry, 1995:264). It is the structural exclusion of females from opportunities of all sorts

that results in their exclusion from white collar and serious street crime (Chesney-Lind and Shelden, 1998:98).

Socialist feminism has been described as integrating the radical and Marxist feminist explanations (Einstadter and Henry, 1995; Messerschmidt, 1986). Socialist feminists draw on radical feminists' arguments about patriarchy, while incorporating the economic arguments of Marxist feminists. This perspective asserts the importance of recognizing the intersection of sex and gender, class, and race in explanations of behavior (Einstadter and Henry, 1995:265).

While not discounting the arguments proposed in feminist theories, recent feminist writers argue that it may be premature to dismiss what Daly and Chesney-Lind (1988) have termed "male-stream" theories (see Canter, 1982a; Chesney-Lind and Shelden, 1998; Figueira-McDonough and Selo, 1980; Giordano and Rockwell, 2000; Smith and Paternoster, 1987). Several recent studies (described in later sections) have demonstrated that some traditional theories *can* explain female delinquency (e.g., Deschenes and Esbensen, 1999; Esbensen and Deschenes, 1998; Giordano and Rockwell, 2000; Heimer and De Coster, 1999; La Grange and Silverman, 1999; Lynskey, Winfree, Esbensen, and Clason, 2000; Rosenbaum, 1987) and, in fact, may explain greater variation in females' than males' delinquency (Rosenbaum, 1987).

Research dating back to the 1970s also showed the utility of "male-stream" theories for explaining females' delinquency. Those earlier studies found that factors drawn from such theories as self and opportunity (Datesman, Scarpitti, and Stephenson 1975); social control, differential association, and strain/anomie theories (Simons, Miller,

and Aigner, 1980; Smith and Paternoster, 1987); and deterrence (Smith and Paternoster, 1987) have predictive power for misbehaviors by both sexes.

But, as Daly and Chesney-Lind (1988:516) question, even if similar processes explain both males' and females' delinquency, "why do such similar processes produce a distinctive gender-based structure to crime or delinquency?" That is, how do similar factors produce a sex disparity in offending? Some reconcile the gender-neutral framework / gender-gap conundrum by proposing the idea of "differential exposure to the same general, predisposing factors" (Rhodes and Fischer, 1993:880; see Cernkovich and Giordano, 1979; Smith and Paternoster, 1987; Rowe et al., 1995). Other contemporary feminists focus on sex and gender as key explanatory and organizing factors (Miller, 2000). For example, recent works by Miller (2000; 2001), Miller and Brunson (2000), and Peterson, Miller, and Esbensen (2001) describe the sex and gender organization of groups as an important influence on females' and males' behaviors within those groups (see too Steffensmeier, 1983). It appears that sex structure and gender dynamics play a role in lessening females' delinquency participation, if not in prevalence, then in frequency.

Miller's (2000) study of robbers exemplifies the relationship of gender structure to the gender-ratio problem. Female robbers did not commit their crimes differently than males or to meet different needs or to accomplish different goals. The differences in their frequency of robbery commission, however, reflected their conscious negotiations within a "gender-stratified" environment (Miller, 2000; Steffensmeier, 1983). Thus, as Miller (2000) argues, although a theory may be able to explain both females' and males'

behavior, it *may not* be able to account for the gender-ratio problem, since it is other factors such as gender structure that produce the disproportionate involvement.

Research by Rowe and his colleagues (1995) reveals that similar factors may be responsible for both within-sex and mean level differences in delinquency. In fact, these authors argue that their study "suggests that sex differences and individual variation in delinquency should require a single explanatory framework" (1995:98). This appears to be in direct contrast to scholars who believe that females and males experience the same etiological factors differently; however, closer examination may suggest that these two perspectives are not in conflict with each other. For example, although a single explanatory framework, i.e., theory of behavior, may provide insight into both females' and males' behaviors, as suggested by Rowe and colleagues, it is also important to examine the larger structural context in which this framework operates, as suggested by Miller and others. Thus, while the same underlying factors may stimulate both male and female behavior, other factors may also work to produce sex differences. Accordingly, as Short (1998) argued, it is important to be sensitive to context. The development of contextual analysis is reviewed in the following section.

ECOLOGICAL PERSPECTIVE

Social disorganization theory lies within the positivist ecological perspective, which examines humans and human behavior in relation to their physical environment (Einstadter and Henry 1995:125). An underlying assumption of positivism is the idea of multiple factor causation (Vold, Bernard, and Snipes 1998:33), which leads to the division of positivist theories into two umbrella groups: 1) individual-level theories,

including biological, psychological, and social characteristics of individuals; and 2) societal-level theories, including environmental factors. Social disorganization theory, with its emphasis on neighborhood characteristics as influences on crime, falls under the second category. Social disorganization theorists attempt to explain the distribution and concentration of crime, especially delinquency; they wish to understand what social or environmental features of an area contribute to a breakdown in social control that leads to high crime rates in order that these features may be manipulated to reduce crime (Einstadter and Henry, 1995:137).

The social disorganization perspective had its roots in early 19th century France, long before Chicago School criminologists popularized the theory. The contributions of three individuals in particular merit note. First, Belgian astronomer Adolphe Quetelet reasoned that the laws governing the celestial, plant, and animal worlds also applied to humans and that these "social mechanics" could be determined through statistics (Beirne, 1993:77). These ideas appear to have contributed to the emergence of the ecological perspective of crime, as well as the furtherance of positivist criminology, i.e., the idea that crime can be understood through the gathering of observable facts. Second, lawyer A. M. Guerry, as the director of criminal statistics for the French Ministry of Justice, created a series of maps plotting crime rates and patterns of crime as they related to other social factors (Vold et al., 1998:28). The mapping of crime in France was an historical antecedent to the use of ecological mapping by Chicago School criminologists. [For a more thorough discussion of Quetelet's and Guerry's contributions, see Beirne, 1993; Vold et al., 1998]. Finally, the work of Emile Durkheim can also be said to be an

historical predecessor to social disorganization theory. His idea of rapid social change as contributing to increases in crime, through a breakdown in social controls, became a central feature of social disorganization theory (Vold et al., 1998).

The social disorganization perspective was furthered between the 1920s and 1940s by a group of criminologists in Chicago. At that time, Chicago was one of many American cities experiencing waves of immigration, the expansion of industry, and an upsurge in crime following Prohibition (Vold et al., 1998:179). This last factor in particular had stimulated a growing interest in the study of crime. Robert Park, a Chicago School urban ecologist, applied ecological principles to the organization and growth of human communities and, with his associates Ernest Burgess and Roderick McKenzie (1925), proposed a "concentric zone" theory upon which Clifford Shaw and Henry McKay built. These researchers noted that the city of Chicago could be divided into different zones according to land usage, population types, and other physical, social, and economic characteristics. They identified five concentric zones: Zone 1 was "The Loop," the downtown area or central business district that contained very low income housing; Zone II was the "Zone in Transition," a low income housing area that was being invaded by business and manufacturing; Zone III contained workingmen's homes; Zone IV was the more affluent "Residential Zone;" and Zone V was the "Commuter Zone," containing the most affluent single-family homes (Park et al., 1925:50).

Shaw and McKay (1942) utilized Guerry's mapping technique and concentric zone theory to describe patterns of crime in the various zones of Chicago (Snodgrass, 1976:9). By doing this, they observed that crime and delinquency were concentrated in

specific areas of the city—those experiencing the greatest transitions, both in population transition and in transitions from residential to industrial areas.

Shaw and McKay noted that this crime concentration held true despite changes in residential composition. That is, as waves of immigrants moved to Chicago, they could afford housing only in the low-income inner zones. Newly-arriving immigrants replaced the current inner-city residents, who had lived there long enough to afford to move to the outer zones. Despite this population turnover, rates of delinquency in the inner zones remained high over the years, and there was no displacement to outer zones as inner-zone residents moved outward. Thus, Shaw and McKay (1942) attributed the higher crime rates to the social environment of these areas and the lack of social control that characterized them, rather than to the individuals who resided in the areas. It is important to note that it is not an assumption of social disorganization theory that neighborhoods that are comprised largely of minority or immigrant residents are inherently disorganized (Bursik, 1988). As Shaw and McKay themselves argue, even though minority populations are proportionately higher in high delinquency areas, "the facts furnish ample evidence basis for the further conclusion that the boys brought into court are not delinquent because their parents are foreign born or Negro but rather because of other aspects of the total situation in which they live" (1969:163-64). Thus, although their and other research has often associated a large minority population with delinquency, it is the degree to which a community can regulate itself that is important, not racial or ethnic composition.

The three key factors influencing delinquency rates in a community were thought to be poverty, residential mobility, and heterogeneity. Importantly, Bursik notes, "Shaw and McKay did *not* posit a direct relationship between economic status and rates of delinquency. Rather, areas characterized by economic deprivation tended to have high rates of population turnover...and population heterogeneity...These two processes, in turn, were assumed to increase the likelihood of social disorganization" (1988:520). Social disorganization is, simply, the inability of a community to realize its common values, to collectively solve problems facing the community, and to exercise informal social control over residents (Bursik, 1988; Kornhauser, 1978:63). In fact, as Bursik describes it, "...the Shaw and McKay model of social disorganization is basically a group-level analog of control theory and is grounded in very similar processes of internal and external sources of control" (1988:521). Individuals living in economically deprived areas moved to more advantaged areas as soon as they were financially able, and the constant influx of new groups lessened the ability (and perhaps willingness) of individuals to form the cohesive bonds that contribute to the effective exercise of informal social control.

From their observations, Shaw and McKay theorized that the invasion, domination, and succession of groups residing in these inner zones, coupled with the invasion of industry, led to social disorganization. These areas were characterized by physical deterioration, poverty, residential areas mixed with commerce and industry, a high concentration of foreign-born population, high residential mobility, a lack of neighborhood or community organizations, high rates of tuberculosis and infant

mortality, and high rates of adult crime. Conflicts of norms and values between different minority groups and between minority groups and the dominant culture were also common. Further, delinquent values and norms were fostered through a process of cultural transmission. Shaw and McKay emphasized that crime and deviance on the part of residents in interstitial areas were "simply the normal responses of normal people to abnormal conditions" (Akers, 1994:142) and that "a delinquency career was *developed* as an adjustment to life" (Burgess and Bogue, 1964:592).

Ecological Theory Research

Studies continued in the 1950s and 1960s in generally successful efforts to replicate Shaw and McKay's work (see, e.g., Bordua, 1958-59; Chilton, 1964; Lander, 1954; Quinney, 1964). Chilton's (1964:73) research in Indianapolis sought to reconcile the disparate findings of Lander's (1954) and Bordua's (1958-59) work in Baltimore and Detroit, respectively. He found similar community-level factors were related to delinquency in all three cities, providing support for the generalizability of social disorganization theory (1964:81).

Quinney's (1964) work also supported the theory, demonstrating a negative relationship between economic status (low education and large proportion of blue-collar workers) and family status (high proportion of female labor force participation, low fertility, and small proportion of single-family housing) and delinquency. A positive relationship was found between racial status (small percentage of non-white residents) and delinquency (1964:150-51). Further, high family status provided a buffer to delinquency, regardless of a community's economic status.

These 1950s and 1960s studies, as did Shaw and McKay's, relied on official delinquency records. Critics later tested the viability of social disorganization theory using self-report data (see, e.g., Johnstone, 1978; Kaspis, 1978), and found a general lack of support for the theory's propositions. Johnstone, for example, found that family status (parent education, parent occupation, and interviewer ratings of family standard of living) was more important than area status (percent of high school graduates, percent of labor force in professional or managerial positions, and median family income) in explaining serious delinquency, and that, contrary to Shaw and McKay's work, these Chicago community-level variables were least effective in predicting a variety of delinquent behaviors (1978:54,68). These findings lend support to the idea of indirect effects of neighborhood-level factors on individual delinquency. Similarly, although he found that the delinquency rate was higher in neighborhoods in which mobility was highest, Kaspis (1978) did not find support for social disorganization's cultural transmission hypothesis. Delinquency was lowest, not highest, in areas in which there were the greatest opportunities for contact with adult criminals (1978:470,478).

Despite their seemingly conflicting findings, these earlier studies provided support for social disorganization theory. Some studies supported a direct relationship between neighborhood-level factors and official delinquency rates, while others found no direct relationship between community factors and individual delinquency. As will be further demonstrated, these findings make sense if one considers the factors that mediate neighborhood effects on individual behavior, resulting in indirect cross-level effects.

Elaborating Ecological Theory

After a decline in popularity due to perceived methodological and theoretical weaknesses, social disorganization theory enjoyed resurgence in interest that continues today (Bursik, 1988; Reiss, 1986). Various criticisms that had turned the focus of research toward individual-level explanations included the following: first, the theoretical concepts were not clearly defined by Shaw and McKay, and, as originally described, the theory was thought to be a tautological argument; and second, following publication of Robinson's (1950) article, using aggregate data to make inferences about individual behavior (the "ecological fallacy") was taboo.

The first criticism stemmed from the fact that "Shaw and McKay sometimes did not clearly differentiate the presumed outcome of social disorganization (i.e., increased rates of delinquency) from disorganization itself" (Bursik, 1988:526). Thus it appeared that delinquency was both an indicator of disorganization and something caused by disorganization. As more recent interpretations of the theory have demonstrated, however, social disorganization refers to the inability of a community to regulate itself (see, e.g., Kornhauser, 1978), and it is this lack of social control that results in delinquency. In regard to the second criticism, many scholars have recognized the fact that both contextual and individual processes are important in understanding individual behavior (e.g., Bursik, 1988; Reiss, 1986), and statistical techniques are now available to appropriately examine these processes.

Some contemporary criminologists have expanded the theory to improve upon weaknesses they saw in the Chicago School version. The theory has thus been applied to

other types of disorganization in the community, including family disorganization, and the theoretical concepts have been more clearly defined so that they may be better operationalized for theory testing. Further, exploration of the role of mediating factors has broadened and refined social disorganization theory. As Bursik notes, "the causal linkage between social disorganization and neighborhood delinquency was not clearly explicated by Shaw and McKay" (1988:521). Thus, many scholars have taken on the task of defining these links. Sampson and Groves (1989), for example, examined the mediating influences of three dimensions of community organization (also see Veysey and Messner's [1999] reanalysis). Local friendship networks, unsupervised peer groups, and organizational participation mediated over half of the effects of low socioeconomic status, high residential mobility, and ethnic heterogeneity on personal and property victimization rates (Sampson and Groves, 1989). None of these latter three independent variables had direct effects on offending rates, but rather were mediated through the effect of unsupervised teenage peer groups on crime rates.

Few studies have combined both individual and community levels of analysis to examine individual delinquency. Simcha-Fagan and Schwartz (1986) examined the effects of four community dimensions (residential stability, economic level, community organization and participation, and criminal subculture) on three delinquency measures. These dimensions accounted for substantial amounts (26-80%) of between-community variation in aggregate levels of official and self-reported delinquency. The amount of variance explained by community-level characteristics was reduced to between two and four percent, however, when individual-level variability in delinquency was examined

(1986:694; also see Elliott et al., 1996; Peeples and Loeber, 1994). Thus, these authors argue that the effects of community-level factors are mediated in large part by individual- and family-level variables.

Cattarello (2000) integrated social disorganization, social control, and social learning theories in her multi-level analysis of delinquency. She found that the effects of neighborhood disorganization on individual lifetime marijuana use were fully mediated by individual peer associations. Contrary to her hypothesized model, disorganization had no effect on social bond variables (individual-level family attachment, school commitment, and beliefs about marijuana). The theoretical model proposed in Chapter Two is similar to Cattarello's model, but also incorporates a unique examination of differential sex effects.

In their study of selected Chicago and Denver neighborhoods, Elliott and his associates (1996) used path analyses to test whether and how organizational and cultural factors (aggregated from individuals' responses) mediate the effects of neighborhood factors on youths' developmental outcomes, including involvement in delinquency and drug use. Next, they employed hierarchical linear modeling techniques to examine the amount of variation in these outcomes that is unique to ecological factors. These latter analyses revealed that neighborhood characteristics accounted for a large proportion of between-neighborhood variation in individual youth outcomes; however, the proportion of within-neighborhood variance (i.e., individual outcomes) accounted for was small. These studies support the idea previously asserted that the conflicting findings of early

social disorganization studies can be resolved by considering the level of the dependent variable (i.e., aggregate or individual) and the possibility of mediating effects.

A number of researchers have expanded the scope of ecological studies by including questions about how ecological contexts affect the ability of families to socialize children. By combining ecological factors with family process variables, these researchers have provided a better understanding of how such variables as economic hardship, socioeconomic status, social isolation, and social disorganization affect family processes and contribute indirectly to delinquency. Sampson (1992:77) clearly argues that to view childrearing as an "interpersonal activity that takes place within individual families...ignores the fact that parenting styles are an adaptation to considerations outside of the household, especially the social organization of the community." Family process variables have been identified as one key link between social disorganization variables and delinquency.

Socioeconomic status (SES) is a significant factor in Shaw and McKay's theory, but several authors report finding no direct link between socioeconomic status and delinquency (e.g., Bank, Forgatch, Patterson, and Fetrow, 1993; Larzelere and Patterson, 1990; Mayer and Jencks, 1989; Peeples and Loeber, 1994; Sampson and Laub, 1994; Stern and Smith, 1995; Tittle and Meier, 1990, 1991). Research by Wright and his colleagues (1999) suggests that this apparent lack of effect of SES on delinquency is due to SES having both negative *and* positive indirect effects on delinquency, resulting in many possible causal links between SES and delinquency, but overall lack of correlation. Family process has been identified as an important intervening factor in this relationship.

In their study of coercion theory, Larzelere and Patterson (1990) report that the effect of socioeconomic status on delinquency is mediated entirely through parental management (parental monitoring and discipline); that is, SES is indirectly related to delinquency through its effect on the ability of parents to provide sufficient monitoring and punishment of behavior (also see Bank et al. (1993) on single mothers' parenting and boys' delinquency). Neighborhood poverty appears to increase family stress and conflict and decrease African-American males' self-worth, increasing their propensity for violence (Paschall and Hubbard, 1998). A similar finding emerged from Sampson and Laub's (1994) reanalysis of the Glueck's 1940s data: family process variables (discipline, supervision, and attachment) mediated two-thirds of the effects of structural factors (e.g., poverty, family size, residential mobility). In their study, living in poverty increased the risk of erratic or harsh disciplinary practices by parents, weak family attachments, and low supervision of children–all factors deemed necessary to socialize children away from delinquency.

Other structural factors examined by Stern and Smith (1995) showed similar relationships for eighth- and ninth-grade respondents in the Rochester Youth Development Study. Disadvantaged neighborhoods influenced delinquent behavior through parental involvement with children: living in neighborhoods that lacked resources and informal social controls inhibited the ability of parents to communicate effectively and spend time with their children. Further, lack of involvement with children reduced parents' ability to provide supervision and control, increasing the opportunity for delinquency (Stern and Smith, 1995).

Other research has shown that youths living in socially disorganized areas with weakened family units (a high divorce rate and a high proportion of female-headed households and families receiving welfare) reported greater attachments to negative peers than youths in other neighborhoods, lower school attachment and commitment, and more aggressive crimes than youths in more advantaged areas (Gottffredson et al., 1991). These researchers did not find, however, that neighborhood disorganization was related to parental attachment, parental monitoring, youths' involvement in conventional activities, or beliefs; nor was neighborhood affluence and education level associated with social bonding variables or association with deviant peers.

Several authors have written that their results support the idea that strong family bonds and social controls can serve as a buffer to the negative effects of neighborhood disadvantage (e.g., Sampson and Laub, 1994; Stern and Smith, 1995). McCord states, "(c)ompetent mothers seem to insulate a child against criminogenic influences even in deteriorated neighborhoods" (1991:411). Peeples and Loeber (1994) concluded, however, that highly managed boys in underclass neighborhoods were still more delinquent than highly managed boys in non-underclass neighborhoods. Similarly, Stern and Smith's (1995) findings included a direct effect of disadvantaged neighborhoods on delinquency that was not mediated through any family process variables. Thus, youths who live in socially disorganized areas, even if they are in the most advantaged family situations, may be more at risk for delinquent behavior than youths in other neighborhoods.

Contextual Effects and Sex Differences in Delinquency

Shaw and McKay's (1942) social disorganization theory was developed to explain males' delinquency and tested with all-male samples, but recent tests provide some indication that neighborhood effects on delinquency may differ by sex (Gottfredson et al., 1991). Research on the influence of school context on girls' and boys' behaviors offers additional support for the possibility of differential sex effects (Figueira-McDonough, 1986).

Findings of differential contextual effects on delinquency by sex are rare, however, likely because research examining this issue is sparse. Gottfredson and her associates (1991) found neighborhood disorganization to be positively correlated with boys' person offending, but this effect was nonsignificant when individual and theoretical factors were controlled. By contrast, total and direct effects of disorganization on girls' person offending were found; the authors note that "females in disorganized areas report more person crime regardless of race, social class, or age" (Gottfredson et al., 1991:215). Further, the contextual effect was only partly mediated by negative peer influences, parental attachment and supervision, school attachment and commitment, involvement, and belief.

No total effect was found for disorganization on boys' property or drug offending, but there was a direct effect on the latter associated with negative peer influence. No effects were found for girls' property or drug offending. Neighborhood affluence exhibited a positive total effect on boys' property crime (see too Johnstone, 1978), but no effect on other types of crime for males and no effects on any type of crime for females.

As demonstrated in this review of the literature, there is also evidence that contextual factors do not have direct effects on youths' behaviors, but rather indirect effects. Kornhauser (1978) asserts that although social disorganization research often begins with similar independent variables, it is the delineation of those factors that intervene between community structure and delinquency that is important in refining and broadening social disorganization theory. This dissertation describes and examines one model for incorporating some of these intervening factors.

While I may not expect neighborhood-level variables to directly and differentially affect females' and males' delinquency, I do expect these variables to operate through socialization within the family, school, and peer group to affect delinquency among girls and boys (see, e.g., Cattarello, 2000; Elliott et al., 1996; Gottfredson et al., 1991; Simcha-Fagan and Schwartz, 1986). For example, gender stereotypes and expectations are transmitted not at the neighborhood-level, but within these more proximal levels, although they do operate within neighborhood contexts. I am particularly interested in whether the model introduced in Chapter Two, integrating "traditional" theories, operates in a similar or different fashion for girls and boys.

The research described in this dissertation examines the influence of neighborhood-level factors on delinquency through these mediating variables, which may work to produce or influence sex differences in delinquency. Thus, while elements of social disorganization theory will be tested with various contextual measures drawn from census data, the proposed model also includes individual-level measures of social control and social learning that will serve as mediating factors. The following sections describe

these theories and their empirical contributions to our understanding of both sexes' delinquent behaviors.

"DON'T FORGET THE WOMEN": FEMALES' INCLUSION IN DELINQUENCY RESEARCH

Even the recent Office of Juvenile Justice and Delinquency Prevention's "Program of Research on the Causes and Correlates of Delinquency" studies are good examples of the extent to which females are even now often excluded from criminological research. Although the Denver Youth Survey achieved equal representation, the Pittsburgh Youth Study utilized all-male samples, and the Rochester Youth Development Study over-sampled males and under-sampled females. Thus, even in these fairly recent (late-1980s), multimillion-dollar studies, the need to include females was de-emphasized.

A comparatively greater number of researchers are now including females in their samples, and some have made a deliberate effort for the specific purpose of studying females' crime and sex differences in delinquency. Recent studies include examinations of the utility of social- and self-control, differential association, and social learning theories for these empirical questions. The following sections examine the contribution of these theories to our understanding of females' as well as males' delinquency and provide justification for their inclusion in the proposed theoretical model.

SOCIAL CONTROL THEORY

Control theorists approach the explanation of deviant behavior from the question not of why some individuals deviate, but of why all individuals do *not* deviate (see. e.g.,

Hirschi, 1969). Thus, deviance is expected, and it is conformity that must be explained. Hirschi explains conformity through a bond to society that makes strongly-bonded individuals less likely than those with weak bonds to become involved in deviant behaviors. This bond increases an individual's "stake in conformity" (Toby, 1957), and those who have not developed societal bonds are "free to deviate."

Four interrelated elements make up this bond to society: attachment, commitment, involvement, and belief. Attachment refers to an individual's affective ties to other persons and groups, and the extent to which he or she cares about others' opinions and feelings. The second aspect of the bond concerns a person's commitment to societal institutions, such as school and employment. A person who is committed has a greater "investment" in conformity, and more to lose by nonconformity. Involvement is the amount of time spent engaging in conventional activities, such as school sports or clubs. Finally, belief refers to a person's internalization of conventional values and his or her acceptance of the legitimacy of societal norms and laws.

Although these four elements generally vary together, it is important to note that some aspects of the bond can be strong while others are weak. For example, a person can be attached to his or her teachers, but not be committed to the institution of education or, conversely, committed to education, but not attached to teachers. It is also not necessary for all four of the bonds to be strong in order to inhibit deviant behavior, although the greater the number and strength of the bonds, the greater the likelihood of conformity.

Specifically in regard to families, social control theory posits that youths who feel an attachment to other family members will be less likely to engage in deviant behavior

for fear of lessening the others' attachment to them; attached youths care about what other family members think and feel. The bond of attachment is also the conduit for passing moral teachings from the parents to the child. Youths who do not feel affective ties to family members are free to deviate, as the feelings of family members are of no great importance. Youths who are committed to the family as an institution, who spend time engaging in family activities, and who believe in the legitimacy of their family values (i.e., they have internalized family norms) will be less inclined to put family relationships in jeopardy by engaging in deviant acts. Weak elements of the bond on the part of the parents can also affect the youth's bond to conventional society. For example, parents who are unattached to or uninvolved with their children do not effectively transmit family norms to the child.

Of particular interest to the current research on serious delinquency are the bond elements of parental attachment and commitment to school. A third key variable in the dissertation is the social control construct of monitoring or supervision of youths. Several variations or adaptations of social control theory have been developed over the years, and often have monitoring and control of youths as a central feature. Two of these variations, self-control theory and power-control theory, are discussed briefly below, since concepts tested in this dissertation are drawn from them.

Self-Control Theory

A recent formulation of control theory, the General Theory of Crime (Gottfredson and Hirschi, 1990) or "self-control theory" as it is popularly known, is more parsimonious than Hirschi's (1969) original social bond theory. Gottfredson and Hirschi

propose that inadequate parental management results in a low level of self-control in children, which makes them more likely to engage in deviant behavior when faced with the opportunity to do so. To adequately manage children, parents must monitor their children's behavior, recognize inappropriate behavior, and punish misbehavior accordingly. If parents fail to perform these necessary steps, children will have under-developed levels of self-control. Gottfredson and Hirschi argue that a child's level of self-control is established by about the age of eight, and that this level of control remains stable across the lifecourse. Persons with low self-control tend to be impulsive, to engage in risk-taking behavior, to be easily angered, to prefer physical activity over mental endeavors and simple over difficult tasks, and to be self-centered. Such traits make them more likely than individuals with high self-control to engage in delinquency, crime, and "crime-analogous" behaviors such as smoking and promiscuous sex. Importantly for the dissertation, Gottfredson and Hirschi assert their theory as general, and thus able to explain both females' and males' crime. The importance of supervision and control of youths' behaviors is apparent in self-control theory, as it is in the theory described in the next section.

Power-Control Theory

One of the first full-fledged theories to address the gender-ratio problem was power-control theory. This theory suggests that sex differences in crime can be understood in terms of fathers' and mothers' relative power in the workplace and in the home (Hagan, Simpson, and Gillis, 1985, 1987). In this sense, and as described in Chapter Two, power-control theory can be considered a cross-level integration.

Hagan and his associates describe "patriarchal" families as those in which husbands control the economic sphere (i.e., they are the "breadwinners") and wives control the domestic sphere (i.e., they are the "housewives"), but have little power relative to husbands. This family type also includes those in which wives work, but hold positions of lesser power in their jobs than husbands and contribute less money to the household than husbands. "Egalitarian" families are those in which fathers and mothers share power in both spheres or in which the father is absent (i.e., female-headed households).

In terms of delinquency, Hagan and his colleagues argue that sex differences will be most apparent in patriarchal families; in these families, daughters' behaviors are controlled more than sons', to prepare them for the domestic sphere, and sons are encouraged to develop risk-taking attitudes and behaviors in preparation to enter the economic sphere. By contrast, sons and daughters are similarly socialized in egalitarian families, resulting in similar levels of behavioral freedom and development of risk-taking tendencies. According to power-control theory, because of the relationship between risk-taking and delinquency, there should be significant sex differences in delinquency in patriarchal families and little difference between sexes in egalitarian families.

Relevant Research

Hirschi (1969), as well as Gottfredson and Hirschi (1990), argue that social control theory holds for all groups, across all societies. Despite their claim, there is evidence of differential effects of the social bond elements and self-control characteristics by sex (e.g., Deschenes and Esbensen, 1998), racial or ethnic group (e.g., Junger and

Marshall, 1997; Smith and Krohn, 1995), and type of delinquency (e.g., Espiritu, 1998; LaGrange and Silverman, 1999).

The criminological literature has tended to emphasize the importance of social influences, such as peers, for males' delinquency and the importance of family for females' delinquency (Campbell, 1990; Canter, 1982a:150). Some scholars have found, however, that family factors are as important, if not more important, for predicting boys' delinquency. In Canter's (1982a) work, family variables explained more of the variance in males' than females' delinquency. In regard to the specific focus of this dissertation (i.e., serious offending), Canter's research showed that although family bonding variables were similar in their nature and strength for both girls and boys, the relationship of these bonds was stronger for boys than girls, especially for serious offenses (1982a:163). Canter thus concluded that "(w)hile family bonds are generally stronger among females, their inhibitory effects on serious delinquency appear to be stronger for males" (Canter, 1982a:163).

Studies that have included measures of social control have found mixed results in terms of their explanations females' and males' behaviors. Bjerregaard and Smith (1993) studied youth gang involvement, an activity that is often correlated with involvement in serious delinquency (Howell, 1995; Howell and Decker, 1999). They did not find that family processes (parent attachment and supervision), poverty (income of principal wage earner), and social disorganization (an index composed of percent on welfare, percent below poverty, mobility, percent female-headed households, duration of unemployment, percent with less than high school education, and racial composition) were related to

gang participation for either girls or boys. The lack of effect of structural factors may reflect the suggested indirect effect of these factors (Cattarello, 2000; Elliott et al., 1996; Gottfredson et al., 1991; Simcha-Fagan and Schwartz, 1986). Further, the lack of effect for family processes may reflect their indirect effects through peer delinquency, which was an important predictor of youth gang involvement.

In their studies of youth gang involvement and violence, Deschenes and Esbensen included measures of social control and also social learning theories. Examining youth gang involvement, these authors suggested that because the importance of the social bond elements differed by sex, females and males might join gang for different reasons (Esbensen and Deschenes, 1998). The social learning variables they included, however, operated in a relatively similar fashion for both girls and boys. These authors' study of youth violence showed that the effects of each of the separate models—social control and social learning—were similar for girls and boys in terms of their explained variance, but the overall explained variance was greater for females than males (Deschenes and Esbensen, 1999). Their two studies suggest that traditional theories can explain females' violence and gang involvement, and may hold greater explanatory power for females' than males' involvement in these behaviors.

Some scholars assert that the findings of greater explanatory power of some theories for females' delinquency are due to the fact that because females are socially required to conform more than males, they may require an extra "push" to engage in non-conforming behavior (see Chesney-Lind and Shelden, 1998; Giordano and Rockwell, 2000; Rosenbaum, 1987). For example, Rosenbaum (1987) theorized that females' social

bonds must be weakened to a greater extent than males' for delinquent behavior to result. She studied the applicability of social control theory to females' delinquency, as well as its ability to explain the differential involvement of females and males. Controlling for both sex and class, Rosenbaum (1987) found that for property crimes and drug use, the social control variables explained a greater proportion of females' than males' delinquency. In addition, although the explained variance in violence was low for all groups under examination, the model best explained upper-class females' involvement.

Espiritu (1998) used structural equation modeling to test whether a sex-invariant or sex-specific integrated model best fit for explaining girls' and boys' delinquency. Her model integrated aspects of control theory (conventional attachments to parents and school, supervision) and social learning theory (delinquent peers, beliefs). She also examined the effects of adverse family environment (low SES, household structure, education, parent criminality), which she argued limits parents' ability to effectively socialize their children due to the stress it creates.

There were few sex differences in family adversity, positive parenting, inconsistent discipline, parent attachment, school attachment, and self-esteem; but there were strong differences in parent supervision, involvement with delinquent peers, and belief variables (Espiritu, 1998). The type of model appropriate varied by youths' developmental stage and by type of offense. Sex-invariant models explained all three forms of delinquency best for younger subjects (7-, 9-, and 11-year-olds at the start of the study) and for status offenses for all age groups under study. Sex-specific models, however, were necessary to explain serious and minor delinquency for the two oldest

cohorts (15 and 16; 17 and 18). In addition, "developmental trends did suggest that the models worked best in explaining delinquency during early and mid-adolescence" (Espiritu, 1998:189). Overall, females and males were more alike than different, and sex differences did not emerge until mid-adolescence (ages 13-16).

Recent studies have also examined the sex generality of self-control theory, with mixed results. Self-control variables predicted a greater proportion of variance in general delinquency and property crime for females than for males and a greater proportion of violence and drug offenses for males than for females (LaGrange and Silverman, 1999). Aspects of self-control had differential effects by sex and delinquency type, but the effects of parental supervision were nearly identical for girls and boys, except for property offenses for which lack of supervision was a much more important predictor for boys. Despite Gottfredson and Hirschi's (1990) arguments about the generality of self-control theory, LaGrange and Silverman write that "(v)ariables measuring self-control, opportunity, and their interactions substantially reduce, but do not eliminate, the impact of gender; it remains a significant predictor of differences in general delinquency, property offenses, and violence" (1999:62).

Similarly, Lynskey and her co-authors (2000) found that while self-control theory was useful for predicting both female and male youth gang involvement, sex did exhibit a significant direct effect. Further, although girls experienced higher levels of parental monitoring, this variable was more important in reducing boys' than girls' gang involvement. In their test of the sex-invariance of self-control theory, Jang and Krohn (1995) discovered that parental monitoring of youths' was important in explaining the

sex-delinquency relationship of youths' aged 13-15, but not at older ages. That is, greater sex differences in delinquency were attributed to greater supervision of females at early adolescence; as youths aged, the ability of parents to monitor both sexes decreased and greater parity in delinquency emerged.

Seydlitz (1993) suggests sex by age differences in the effects of direct (e.g., supervision, discipline, rule-setting) and indirect (attachment to parents, agreement with parents' opinions) parental controls. The hypothesis that the effect of direct control depends on attachment to parents was supported only for girls aged 13-14; for this group delinquency was greatest when parental attachment was low and monitoring and discipline were high. For boys aged 13-14, higher levels of parental control were directly related to higher rates of delinquency, and this relationship did not depend on attachment.

School factors have also proved differentially important by sex in recent empirical work. Risk factor research identifies school variables as a major delinquency and gang risk factor for females, more so than for males (Thornberry, 1998). In addition, school expectations were important for girls' but not boys' gang involvement (Bjerregaard and Smith, 1993); school commitment was important for girls' but not boys' violent behavior (Deschenes and Esbensen, 1999); and, attachment to school was more important for girls' than boys' drug and property offending (Rosenbaum, 1987; also see Johnson, 1979). By contrast, school attachment/commitment was a stronger protective factor for boys than girls in Gottfredson and her colleagues' (1991) research.

Specifically in regard to power-control theory, Hagan and his colleagues have generally found empirical support. In one study, for example, girls in patriarchal families

were more likely than boys to be controlled by mothers, they perceived higher risks of being caught, and they committed theft less often than boys. Conversely, in less patriarchal families, girls, treated more similarly to boys, exhibited similar perceptions of risk and theft behavior as boys (Hagan, Gillis, and Simpson, 1990). Other researchers have not found the same level of support (e.g., Leiber and Wacker, 1997; Morash and Chesney-Lind, 1991; Singer and Levine, 1988).

Chesney-Lind and Shelden criticize the power-control theory as being "a not too subtle variation on the 'liberation hypothesis,'" (1998:120), in that Hagan and his colleagues argue that mothers' working outside the home increases daughters' crime. Further, these authors contend, there is no evidence that females' labor force participation has actually increased female delinquency: as labor force participation and the number of female-headed households had increased, aggregate female delinquency (either official or self-reported) had either declined or stayed the same (Chesney-Lind and Shelden, 1988:120). Singer and Levine (1988) reported that, contrary to the expectation of greater sex differences in patriarchal families, sex differences were actually greater in egalitarian households. Further evidence contradicting power-control theory emerged from Morash and Chesney-Lind's (1991) study: girls in all types of families (two-parent, step-, and single-mother) were less delinquent than boys, and in unemployed single-mother families, boys were controlled more than girls. Leiber and Wacker's (1997) research on single-mother families, however, seems to indicate no significant sex differences in maternal control and delinquency, although females in their study were more influenced by delinquent peers than were males. A final criticism offered by Chesney-Lind and

Shelden is that power-control theory fails to account for any class influences, suggesting that "girls from upper-status families whose mothers work are equivalent to girls who are growing up in poverty with a single mother" (1998:120). Clearly, more research is needed to determine whether girls and boys in different family types and neighborhoods are socialized and experience their environments differently.

SOCIAL LEARNING THEORY

Social learning theory, as described by Akers (1985), is an extension of Sutherland's (1924) differential association theory. Akers adds the concepts of differential reinforcements and imitation to the differential associations and differential definitions concepts set forth in differential association theory. Both differential association and social learning theories are based on the assumption that all behavior, conforming or deviant, is learned in close associations with others who may differentially engage in law-abiding or breaking behaviors. The learning process occurs both through imitation of others' behaviors and through conditioning (primarily operant or instrumental) in which behavior is shaped by the consequences (positive and negative rewards and punishments) that follow a given behavior. Through these processes of positive and negative reinforcements, a person learns definitions of behaviors as good or bad. An excess of definitions unfavorable to law-abiding behavior and favorable to law-breaking will increase the likelihood of deviance. Whether an individual learns more definitions favorable than unfavorable is influenced by the frequency, duration, priority, and intensity of associations. That is, the persons most likely to influence an individual's learning process are those with whom an individual more frequently associates, for the

longest period of time, at the earliest point in their lives, and with whom they are closely bonded.

Relevant Research

Some authors have investigated whether social learning variables and processes differ for females and males, including researching the effects of peer associations, perceived guilt, and the use of neutralizations. These concepts are related to each other in that neutralizations (or rationalizations) are used by people to reduce or eliminate the level of guilt they would feel for engaging in criminal activity. By justifying one's behavior by reframing it, one avoids negative feelings that would prevent commission of the act. If one rationalizes stealing, for example, by saying, "It's okay to steal something from someone who is rich because they can easily replace it," feelings of guilt will not get in the way of going through with the theft. Peers are often a source of learning these definitions of behaviors as good or bad; youths who associate with peers who engage in deviant behaviors without feeling guilt are likely to adopt their peers' neutralizing attitudes.

Perceived guilt for potential delinquency seems to be a stronger inhibitor of violence for girls than boys (Deschenes and Esbensen, 1999), but the reverse is true for gang membership (Esbensen and Deschenes, 1998). Examining the joint influences of parental monitoring and peer influence on adolescent substance use, Fletcher and her colleagues (1995) found that, in general, girls were influenced more than boys by their parents and boys more so than girls by their peers. Conversely, although use of neutralizations was a stronger predictor for males than females, peer associations were

found by Mitchell and his colleagues (1990) to be more important for girls' than boys' delinquency (see too Esbensen and Deschenes, 1998, on gang membership). In her review of research on female and male peer associations, Campbell (1990) argues that girls' close associations with delinquent peers (female as well as male) are just as important for their delinquency as for males' delinquent behavior.

Many researchers have noted that the ability of families to control their children interacts with and is often tempered by the social learning processes occurring in youths' peer networks (e.g., Fletcher, Darling, and Steinberg, 1995; Elliott, Huizinga, and Ageton, 1985; Warr, 1993). Thus, social learning variables are sometimes examined simultaneously with social- or self-control variables to determine the relative influence of parents and peers and to provide a better understanding of paths to delinquency (see too several of the studies described in the previous section).

Warr (1993) found that involvement (time spent) with family lowered delinquency, but that being attached to parents had no direct effect on delinquency. Rather, weak attachments freed youths to form friendships with delinquent peers, which then increased delinquency. A more in-depth look at this relationship revealed that, consistent with self-control theory, poor parenting resulted in an oppositional or defiant orientation, i.e., low self-control, in "early starters" (those engaged in delinquency before age 14), which led independently and directly to both an association with delinquent peers and to delinquency (Simons, Wu, Conger, and Lorenz, 1994). In "late starters," inept parenting led to an association with delinquent peers, which then resulted in delinquent behavior. This latter finding is more closely aligned with social learning

theory. Benda and Whiteside (1995) also integrated social control and social learning variables and found that attachment of youths to parents and commitment to religion increased youths' belief in the law and lessened their associations with deviant peers, and thus delinquency. Association with delinquent peers led to modeling of misbehavior and use of neutralizations, both of which increased delinquency.

There is also evidence that females and males have similar experiences learning in intimate primary groups, and that, consistent with differential association theory, both groups experience exposure to definitions favorable to law-breaking that are early, frequent, intense, and recurrent (Giordano and Rockwell, 2000:11; Heimer and De Coster, 1999). Heimer and De Coster's research suggests, however, that "there are important gender differences in the process by which youths learn violent definitions" (1999:302). These authors argue that differential association theory does not explain gender differences in the learning process, nor does it account for cultural definitions of gender which are important in explanations of gender differences in behavior (1999:282). Heimer and De Coster examined the effects of direct controls (supervision and discipline) and indirect (emotional bonds) controls, and hypothesized a sex difference not only in the level of control, but also in the level of influence of that control on delinquency: "gendered familial control arises when parenting processes differentially influence girls' and boys' learning of violent definitions" (1999:284). They also note the importance of considering both structural and cultural influences on behavior: "structural positions in part determine the others with whom individuals come into contact and thus shape the

context of learning...similarly, objective opportunities to commit crime are likely correlated with structural positions" (Heimer and De Coster, 1999:279,280).

Heimer and De Coster suggest three hypotheses. First, "youths from structurally disadvantaged families, including lower social class, welfare, black, and female-headed families, are likely to experience lower levels of supervision and emotional bonding to families than other youths...and higher levels of coercive discipline" (1999:286). As a result, they argue, disadvantaged youths will also be more likely to form oppositional, deviant peer groups. Second, they hypothesize that youths' "structural positions may influence the learning of violent definitions directly, independently of family controls, peer associations, and behavioral histories" (1999:287). Third, they suggest that gender role expectations will vary by structural position, e.g., class, race, residence in a female-headed household, such that expectations will be less rigid in middle-class than in working- and lower-class families, in African-American than in white families, and in female-headed households (1999:287).

These hypotheses were supported, and the overall findings were that coercive discipline had a greater effect on boys' than girls' learning of violent definitions while bonds to family affected girls' but not boys' learning of violent definitions (Heimer and De Coster, 1999:302). Thus, girls' violence was reduced by indirect controls on their learning of violent definitions, while boys' violence was best predicted by the influence of direct controls on the learning process: coercive discipline increased risk of violent delinquency and supervision decreased this risk.

SUMMARY

Many of the studies described in the preceding sections appear to provide support for the applicability of traditional theories to females' delinquency. For example, contrary to "traditional" arguments about the importance of family for girls' delinquency and the importance of peers for boys' delinquency, there is little evidence that families are more powerful predictors for female deviance and that peers are more powerful predictors of male deviance. This partial support for the generality of delinquency theories does not mean we should dismiss the role of social structures in shaping girls' and boys' behaviors, but it does mean that we should continue to explore the similar and different causes of their behaviors, keeping an open and critical mind. As Rhodes and Fischer note, "Despite the critical role of gender in shaping female delinquency, it is also important to appreciate the gender-neutral influences on their behaviors. Exclusive focus on gender can diminish our appreciation of the crucial roles of such factors as family dysfunction, peer or gang influence, and impoverished neighborhoods and schools" (1993:888).

An important finding that emerges from this review is that, even though the theories under examination exhibited explanatory power for both females and males, at times, aspects of those theories operated differently for females and males. Parental monitoring, for example, was negatively related to boys' but not girls' levels of gang involvement (Lynskey et al., 2000) and frequency of violent offending (Deschenes and Esbensen, 1999), and maternal attachment was positively related to their gang involvement (Esbensen and Deschenes, 1998). Another social bond element, school

commitment, was significantly and negatively related to girls' but not boys' violence (Deschenes and Esbensen, 1999), gang membership (Bjerregaard and Smith, 1993; Esbensen and Deschenes, 1998), property crime, and drug use (Rosenbaum, 1987; but see Gottfredson et al., 1991). Variables drawn from social learning theory have also evidenced differential sex effects (e.g., Deschenes and Esbensen, 1999; Esbensen and Deschenes, 1998; Heimer and DeCoster, 1999; Mitchell et al., 1990).

An issue that has not been adequately addressed in the literature is the disproportional involvement of males in deviant behavior. Again, some propose the idea of differential exposure to relevant theoretical factors, while others suggest the possibility of a larger contextual framework that produces sex differences. There is also the possibility that these contextual factors and their effects differ by neighborhood. Miller argues that gender structure, particularly gender inequality "constrains the types of opportunities females have available to them...This is especially true in poor communities and even is true when it comes to the commission of crime" (2000:43; Steffensmeier, 1983). Other research, for example Heimer and De Coster (1999), lends credence to the greater effects of gender inequality in poor communities. For these reasons, we may expect female-male differences in delinquency to vary across neighborhoods.

FULL PROPOSED INTEGRATED MODEL

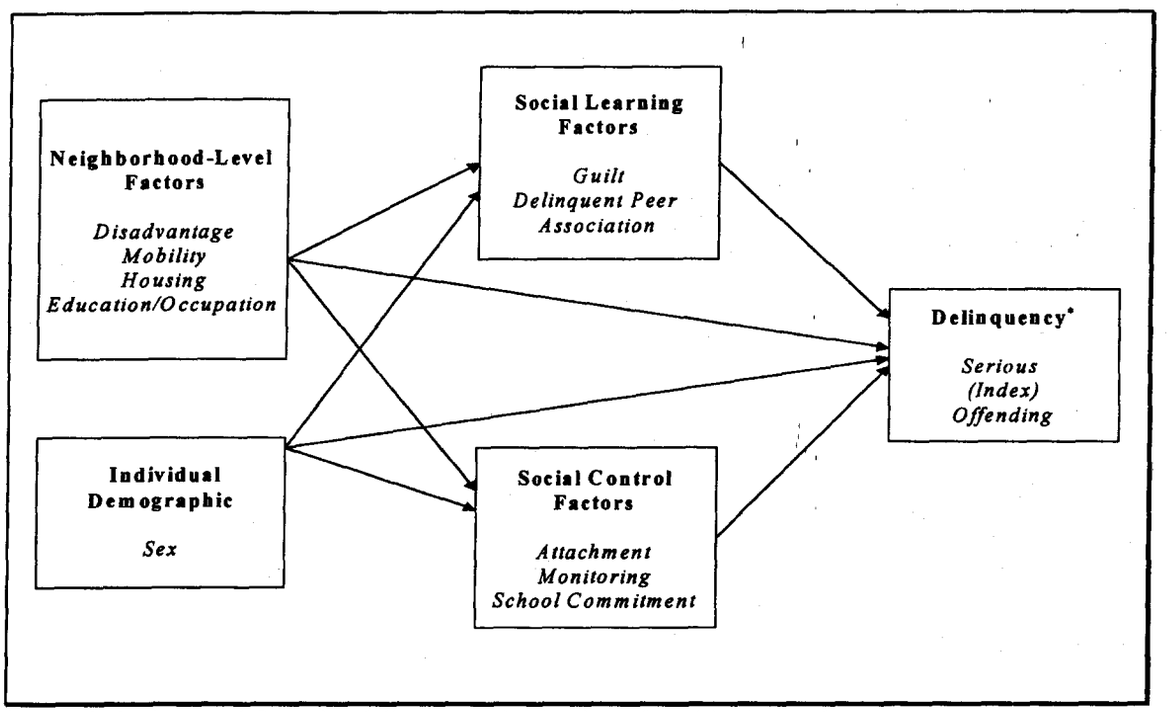
The theoretical model examined in the dissertation draws on the feminist and ecological perspectives, and is a cross-level integration of social disorganization, social control, and social learning theories. The theories and research described in the previous

sections offer insight into how the various concepts and propositions can be integrated. Although this dissertation applies a unique approach to examining these issues (i.e., by linking census- and individual-level data, applying HLM, inquiring about sex differences or similarities in explanatory variables, and focusing on serious offending), integration of these ideas is not entirely unique. In their study of 85 women, for example, Baskin and Sommers describe how the "convergence of social learning, control, and ecological theories helps to explain how weak school attachments and parental supervision, associations with delinquent peers, and other social and economic processes prevalent in severely distressed communities...combine with individual-level and situational factors to initiate involvement in violent street crime" (1995:577; see too Sommers and Baskin, 1994).

Other research has shown that in socially disorganized areas, deviant peer groups socialize youths into criminal subcultures; further, in neighborhoods with low proportions of two-parent families, crime and delinquency are higher than in other neighborhoods because youths experience lower levels of supervision and/or because they have weaker bonds to family and school. In these neighborhoods, "parental authority and control is replaced by that of peers" (Reiss, 1986:15). Gottfredson and her colleagues tested the hypothesis that in socially disorganized areas, youths "will experience less supervision from adults, feel less attached to school and committed to education, associate more with delinquent peers who exercise weak or no control, and believe less in conventional proscriptions against misconduct" (1991:201). They found that while youths in disadvantaged neighborhoods were less bonded to conventional institutions, experienced

more negative peer influence, and had lower school attachment and commitment than youths in more advantaged areas, parental attachment and supervision were not related to neighborhood disorganization. These examples draw on multiple theoretical perspectives and lend support for the following proposed relationships depicted in Figure 3.1.

Figure 3.1. Full Proposed Integrated Model



*A statistical control for prior delinquency is also introduced in the analyses.

Several general hypotheses are suggested by this model. The first set of hypothesized relationships to be discussed (Hypotheses 1-3) is related to the question of whether this cross-level theoretical model is useful for explaining youths' serious delinquency; for example, do neighborhood factors relate directly and/or indirectly to individual offending and are these individual-level factors significant predictors of delinquency? The second set of hypotheses (Hypotheses 4 and 5) relates to whether the model operates in a similar or different manner for girls and boys.

Hypothesis 1: Frequency of serious delinquency will vary across the census tracts in this study.

There will be differences in youths' delinquency across neighborhoods in the sample that are potentially explainable by contextual factors. There is theoretical (social disorganization theory) and empirical (official statistics, for example) evidence that indicates that crime and delinquency, and particularly more serious offenses, are concentrated in certain areas and not evenly distributed across neighborhoods.

Hypothesis 2: Sex (being female), Parental Attachment, Parental Monitoring, School Commitment, and Guilt will significantly and negatively affect serious delinquency; Delinquent Peer Associations will significantly and positively affect serious delinquency.[2]

First, we know from a variety of sources (official statistics, self-report and victimization data) that being female is associated with lower rates of delinquency, especially more serious delinquency. Second, in his discussion of social bonds, Hirschi (1969) asserts that if one is attached to one's parents and highly committed to school, a person has a "stake in conformity" that involvement in delinquency is likely to attenuate. Thus, an attached and committed youth will be less likely to engage in delinquency for fear of breaking bonds to family and school and losing her or his stake in legitimate societal institutions. Third, if one's whereabouts are monitored by parents, one is less likely to engage in delinquent behavior for fear that one's misbehavior will be detected

[2] See Chapter Four for descriptions of all independent and dependent variables and their creation.

and punished. Therefore, the greater the parental monitoring of the youth, the lower his or her frequency of delinquency.

Fourth, if it is likely that one will feel guilt for engaging in delinquent activity, one will be likely to avoid delinquency in order to avoid those negative feelings; so the greater the level of guilt, the lower the delinquency. Finally, the more delinquent peers with which one associates, the more likely one will be to engage in delinquency. People learn most in groups that are most important to them, with whom they have the most intense relationships, and with whom they most frequently associate. For this age group (12-14), peers are starting to become more important than family as a reference group, and youths are beginning to experiment with identities and behavior. Youths who associate with peers who are delinquent are likely to imitate peers' behaviors, rationalize their behaviors to neutralize guilt, and adopt definitions of these behaviors as "good" through positive reinforcement from delinquent peers.

Hypothesis 3: The effects of neighborhood-level variables on serious delinquency will be mediated, in full or in part, through the effects of the individual-level variables (parental attachment, parental monitoring, school commitment, perceived guilt, and delinquent peer association).

Neighborhood factors—including a composite measure of concentrated disadvantage (comprised of neighborhood proportions of poverty, welfare, unemployment, African-American residents, and single-parent families), mobility rate, housing variables (proportions of units overcrowded and unit density), and neighborhood education and occupation—will exhibit main effects on youths' serious offending.

Greater "disadvantage" scores on these variables will be related to greater frequency of serious offending for the whole sample.

"Meso"-level community factors provide the mechanism by which neighborhood variables operate. Unfortunately, in this study, these variables are unmeasured; thus, these relational mechanisms must be inferred based upon prior research (e.g., Elliott et al., 1996; Sampson and Groves, 1989; Sampson et al., 1997). Sampson and Groves (1989), as discussed previously in this chapter, delineated three specific intervening mechanisms between social disorganization and crime: local friendship networks, unsupervised peer groups, and residents' organizational participation. Community factors, such as socioeconomic status, racial/ethnic composition, mobility rates, family status, and housing characteristics, can inhibit communities' and families' abilities to exercise social control through intervening mechanisms such as these. Since these variables are unmeasured in the current study, however, only "direct" effects of neighborhood factors on crime can be measured.

Concentration (abandonment) of the poor and of racial and ethnic minorities in particular areas has created a situation of cumulative disadvantage that inhibits social control through social isolation and lack of resources (Massey and Denton, 1993; Wilson, 1987). Popkin and her colleagues (2000), for example, document the general distrust of neighbors in Chicago's infamous public housing developments; although some respondents reported close ties to particular neighbors, nearly all resolutely avoided taking collective action against problems plaguing their neighborhood complexes, believing nothing would come of their efforts and fearing for their safety. In areas

characterized by the absence of social control, delinquency is likely to be higher than in areas in which residents have the stability and resources to collectively work toward common goals.

Neighborhood variables will also exhibit indirect effects on delinquency through their effects on social control and social learning variables. For example, the greater the disadvantage in a neighborhood, the lower the levels of parental monitoring, the lower youths' school commitment, the lower the levels of guilt for potential deviance, and the greater the association with delinquent peers. I am unwilling to state that parental attachment will be lower in disadvantaged communities; prior research does not support this assertion. The findings in the literature regarding parental attachment are conflicting, however, when it comes to its relative importance for girls' and boys' behaviors; for this reason, this variable is included in the analyses.

Several supporting statements can be made regarding the indirect effects of neighborhood factors through social control and learning variables. First, levels of parental monitoring may be lower in disadvantaged than in non-disadvantaged neighborhoods. High unit density (i.e., a high proportion of multiple-unit dwellings such as apartments) and overcrowding (high percentage of units with a high number of persons per room), for example, in a neighborhood mean that more activity takes place outside the home, away from parental or other adult control (Stark, 1987). Thus, neighborhood context reduces the ability of parents to monitor children, and this in turn increases delinquency.

Second, youths' levels of school commitment may be lower due to scarcity of institutional resources (as a result of economic marginalization) that in turn affect quality of education and/or to lowered educational expectations. Neighborhood poverty, unemployment, and low SES, for example, diminish educational expectations and aspirations, and education is less likely in disadvantaged neighborhoods to be seen as an avenue to success (Figueira-McDonough, 1993). Thus, it is not as highly valued as in more advantaged neighborhoods. A high neighborhood mobility rate can also lessen youths' commitment to school, if there are continual disruptions due to transition. In these ways, neighborhood factors can lower school commitment, which is related to higher rates of individual offending.

Third, neighborhood factors can have an influence on youths' levels of guilt. High poverty, unemployment, and welfare rates, for example, can create a situation in which one is less likely to feel guilt for engaging in delinquent acts to "get by." As Akers points out, Shaw and McKay saw crime and deviance in socially disorganized areas as "simply the normal responses of normal people to abnormal conditions" (1994:142). Here, neighborhood context can increase delinquency through its negative effect on levels of guilt.

Finally, as mentioned previously, characteristics of disorganized neighborhoods make it difficult for residents to exercise informal social control, increasing the possibility of youths' associations with peers who are delinquent. High mobility rates, for example, inhibit the development of relational neighborhood ties, high unit density and overcrowding means that more activity takes place on the street, and a high

proportion of single-parent families often decreases supervision (by having one fewer parent in the household) not only of the families' children, but of other neighborhood children as well. These conditions allow unsupervised peer groups to form, and these groups are then available for youths to associate. Association with peers who are delinquent increases the frequency of a youth's offending.

To restate briefly, I hypothesize that sex (coded 1 for female), parental attachment, parental monitoring, school commitment, and feelings of guilt will have negative effects on frequency of serious delinquency, and delinquent peer association and prior delinquency will have positive effects on delinquency. If neighborhood factors are found to influence these individual-level factors, and these individual-level factors are related to delinquency, then indirect effects of neighborhood factors on delinquency are present, and Hypothesis Three is supported.

Hypothesis 4: Significant cross-level interactions will be found between each of the neighborhood-level variables and sex.

The focus here is on general hypotheses, due to the exploratory nature of this question and the lack of prior research on the question of differential neighborhood effects by sex. It is expected that neighborhood factors will influence girls' and boys' behaviors in different ways. Prior research has described the lesser opportunities for girls than boys, particularly in disadvantaged neighborhoods (Heimer and De Coster, 1999; Miller, 2000). It is reasonable to assume, therefore, that girls experience structural exclusion from illegitimate, as well as legitimate, opportunities, lessening their involvement in serious delinquency (Cloward and Ohlin, 1960; Miller, 2000; Simpson,

1991; Steffensmeier, 1983). In socially disorganized areas in which, as Burgess and Bogue put it, "a delinquency career (is) *developed* as an adjustment to life" (1964:592), girls may find themselves systematically blocked by males from illicit money-making activities (e.g., large thefts, burglaries, auto thefts, and robberies), which are also activities that may put the actor at greater risk for involvement in person offenses (e.g, aggravated assault). Thus, while greater social disorganization and disadvantage will be associated with greater delinquency in general, these influences will be more important for males than for females. As neighborhood disadvantage decreases, the opposite is expected: higher social position will be associated more strongly with increases in girls' than boys' offending.[3]

Although these will not be tested in the dissertation, there are intermediary factors at work that either mediate or moderate the relationships between neighborhood disorganization and delinquency for girls and boys. That is, it is likely that neighborhood factors differentially influence girls' and boys' behaviors indirectly, through their effects on family, school, and peers. Neighborhood concentrated disadvantage, education level, and occupation type (percent in professional and managerial jobs), for example, will affect girls' offending through such mechanisms as school commitment. In general, girls feel lower educational and occupational expectations (it is important to differentiate *expectations* from *aspirations*, which are often not lower) than do boys (Wilson and Wilson, 1992), and these expectations may be further attenuated in distressed neighborhoods. If poor neighborhood conditions lessen school commitment, as already

[3] The focus of this dissertation is on comparing girls and boys; intra-sex comparisons across levels of

hypothesized, this will have greater influence on females' than males' delinquency (Bjerregaard and Smith, 1993). Rosenbaum and Lasley (1990), for example, found that the school-delinquency relationship was affected more strongly by community context (a census tract-level measure of social class based on median income: lower or middle/upper) for girls than for boys (Rosenbaum and Lasley, 1990:507-08, 511). Thus, while the relationships between disadvantage, education, occupation, school commitment, and delinquency may be important for both girls and boys, I expect that they will be more important for girls than for boys.

Hypothesis 5: Each individual theoretical predictor will interact significantly with sex. That is, the effects of each of the variables will differ by sex.

Based on "traditional" beliefs and arguments about the role of parents, school, and peers in shaping girls' and boys' behaviors, a number of hypotheses can be made. For the five individual-level theoretical variables, I hypothesize that although the model will operate in similar fashion for girls and boys, levels of parental attachment and monitoring, school commitment, and guilt will be more important predictors for girls' than for boys' frequency of serious offending. Delinquent peer association will be a stronger predictor of boys' than girls' serious delinquency.

Variables drawn from social control theory are expected to have stronger inhibitory effects on girls than on boys. Positive interactions with and attachments to parents inhibit delinquency in general, but these processes have been found to vary by sex (Simpson and Elis, 1995:47). Hirschi (1969) asserts that weak bonds will be

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disadvantage are also essential, but these are beyond the scope of this research.

associated with greater delinquency in general (i.e., for both sexes), but I expect, given stereotypical assumptions about the strength of females' bonds to family, that weak attachments will be a greater influence on girls' than boys' delinquency.

Females experience greater monitoring by parents than do boys, and this supervision is related to lower levels of risk-taking and delinquency (Gottfredson and Hirschi, 1990; Hagan, Simpson, and Gillis, 1985). Although Gottfredson and Hirschi (1990) predict that lack of supervision will produce (through under-development of self-control) similar involvement in delinquency for girls and boys, the relative importance of this variable will be greater for girls' than boys' serious offending.

School commitment and attachment have been found to inhibit delinquency in general, but prior research shows these variables to be more important for females than males. Females tend to exhibit greater attachment and commitment to school than do boys, perhaps because they are socialized to conform (Rosenbaum and Lasley, 1990; Simpson and Elis, 1995); the importance of school thus creates a stronger school-delinquency relationship for girls than for boys.

Level of guilt for potential delinquency is also expected to be more important for females than for males. Traditional gender role socialization creates stronger conforming attitudes and behavior in females. Thus, girls' greater feelings of guilt associated with potentially engaging in delinquency will inhibit them from doing so.

In general, girls have fewer delinquent friends than do boys (e.g., Morash, 1986). In keeping with the "differential exposure" thesis, girls' delinquency is expected to be lower because they are less exposed than boys to the negative influences of delinquent

peers. While it is true that girls, when they associate with peers who are delinquent, are influenced by these peers, the structure of the peer group is also important. In mixed-sex groups, girls' delinquency is likely to be inhibited, while boys' delinquency is amplified (Peterson, Miller, and Esbensen, 2001). If at this age (12-14), girls and boys are likely to hang out with each other in more sex-balanced than disproportionate groups (as interest in the opposite sex is piqued), it is likely that the effects of delinquent peers will be greater for boys than for girls.

These statements in support of Hypothesis 5 are intentionally stereotypical. These simplistic notions obviously overlook the complexity of girls' and boys' encounters and interactions in their families, schools, and peer groups. My intention in this research, however, is not to explore these complexities—this will be left to another research project—but rather to test the usefulness of concepts drawn from traditional criminological theories in explanations of delinquency across sex.

This chapter has presented an overview of the theoretical and empirical underpinnings of the dissertation research. Several theories provide the framework: ecological, feminist, social control, and social learning. This integrated framework is used in this research to examine the utility of traditional theories to explain both female and male delinquency and to explore whether the theoretical factors operate similarly or differently for girls and boys. Chapter Four describes the data used to test these hypothesized relationships, the limitations of these data, and the analytical plan employed to examine the integrated theoretical model and hypothesized relationships specified in Chapter Three.

CHAPTER FOUR:

RESEARCH DESIGN AND ANALYSIS STRATEGY

The data for this dissertation are drawn from the longitudinal portion of the National Evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program, funded by the National Institute of Justice (award 94-IJ-CX-0058). Created in 1991 by Phoenix-area police departments in cooperation with the Federal Bureau of Alcohol, Tobacco, and Firearms, G.R.E.A.T. is a school-based gang prevention program taught by uniformed law enforcement officers (see Winfree, Lynskey, and Maupin, 1999, for an overview of the program's origin and development). The eight-lesson curriculum is offered in nine one-hour sessions to the target population of seventh-graders.

In 1994, as the G.R.E.A.T. program began to be adopted across the United States and even in other countries, the National Institute of Justice solicited proposals to evaluate the program. Finn Esbensen, then of the University of Nebraska at Omaha, was awarded funding to serve as Principal Investigator and conduct the National Evaluation. The multi-site evaluation contained several components, including both a process and outcome evaluation (see Sellers, Taylor, and Esbensen, 1998, for the process evaluation results). The outcome evaluation also contained several components: a cross-sectional design (see Esbsensen and Osgood, 1999, for a review of this design and results), a six-wave longitudinal design (see Esbensen, Osgood, Taylor, Peterson, and Freng, 2001), and satisfaction surveys with various stakeholders (see Freng, 2001; Peterson, 2001a; and Taylor, 2001). This dissertation examines two waves of data from the longitudinal portion of the evaluation.

G.R.E.A.T. LONGITUDINAL RESEARCH DESIGN

Site Selection and Sampling Procedures

Six cities were purposively selected for inclusion in the longitudinal phase of the evaluation, based upon three criteria (Esbensen et al., 2001). The first criterion for inclusion was the existence of an operative G.R.E.A.T. program. To assess G.R.E.A.T. program impact, it was necessary to select in which law enforcement agencies were offering the program in at least some of the community's schools. The second criterion was geographic location, to provide both geographic and racial/ethnic diversity within the sample. Sites included an East Coast city (Philadelphia), a West Coast location (Portland, Oregon), the site of the program's inception (Phoenix), a Mid-West city (Omaha), a non-gang city (Lincoln, Nebraska), and a small "border town" with a chronic or entrenched gang problem (Las Cruces, New Mexico). The third criterion was the cooperation of the school districts and police departments in each site.

Twenty-two public middle schools from these six locations were purposively selected (having offered the G.R.E.A.T. program in the previous year) and agreed to participate in the evaluation. It was possible to randomly assign classrooms to experimental and control conditions in 15 out of the 22 schools (Esbensen et al., 2001). In the other seven schools, more purposive assignment was used, based on G.R.E.A.T. officer availability and/or limitations imposed by the school or school district; a variety of procedures were used to ensure comparability of groups. The assignment process resulted in a sample of 3,568 students in 76 G.R.E.A.T. and 77 non-G.R.E.A.T. classrooms. Due to fiscal re-organization in one school, one of the experimental classes

was canceled and the students dispersed among the remaining five classes. Because this occurred prior to the evaluation pre-test, it did not affect the evaluation results.

Because this sample is public school-based, it has the usual limitations associated with school-based surveys (Esbensen et al., 2001; Junger-Tas and Marshall, 1999). For example, private school students are, by definition, excluded. Of public-school students, those who had been expelled, suspended, truant, sick, and/or tardy on the day of survey administration were not included. [This applied to the first survey administration; for subsequent administrations, we visited schools numerous times to capture students who had been absent for any number of reasons, and we mailed questionnaires to those whom we were unable to contact in school.] Thus, there is potential under-representation of "high-risk" youth. This is not a random sample and generalizations cannot necessarily be made to the adolescent population as a whole.

Active Consent Process

Researchers using juveniles as subjects must obtain parents' approval for their child's participation (Esbensen, Deschenes, Vogel, West, Arboit, and Harris, 1996). Two types of parental consent procedures are available: passive and active. Under passive consent procedures, parents are required to return a signed form only if they do not wish their child to participate; if a form is not returned, parental consent is implied and the child is included in the study. Under active parental consent procedures, parents must sign a form allowing their child to participate; if a form is not returned, parental refusal is implied and the child may not be included in the study (Esbensen et al., 1996).

Passive parental consent procedures were approved by the University of Nebraska Institutional Review Board for the evaluation pre-tests, but active consent was required for later waves of data collection (Esbensen et al., 2001). One site (Omaha), however, enacted a new policy in the spring of 1995 that required active consent for all school-based research; thus, active consent was used in that site beginning with the pre-test (see Esbensen et al., 1999, for a detailed discussion of procedures used to increase active consent rates in the Omaha site).

A modified Dillman (1978) "total design" method was used for the active consent process (Esbensen et al., 2001). Although the timing and sequencing differed across sites, the following is a description of the general process used. In the spring and summer of 1996, three direct mailings were made to parents of study participants; mailings included a cover letter, two copies of the parental consent form, and a business reply envelope. Spanish versions of the letter and consent form were included in mailings to parents in Las Cruces and Phoenix. All parents who did not respond after the second mailing were contacted by phone. School personnel also assisted, distributing letters and forms in the classroom and rewarding students with a new pencil upon return of the forms. Some teachers allowed the research team to offer additional incentives, such as pizza parties to classrooms that reached a minimum 70 percent return rate; other teachers offered their own incentives, such as early lunch passes or extra credit.

The result of these intensive efforts was a 67 percent response rate, with 57 percent of parents approving their child's participation and 10 percent refusing

participation. Thirty-three percent failed to return the forms. Thus, the active consent sample consisted of 2,045 students from 153 classrooms in 22 schools.

Research with this particular sample, consistent with other research producing similar results, has shown that active consent procedures lower response rates (Esbensen et al., 1996; Esbensen et al., 1999). A related and more serious problem is that of representation of the resulting sample and possibility of biased responses. Indeed, comparative analyses of the G.R.E.A.T. evaluation sample revealed several significant differences between students for whom we obtained active parental consent to participate, students for whom we received a refusal from parents, and students whose parents failed to return a form at all (Esbensen et al., 1999). Statistically significant differences were found for race, parent education, family structure, and G.R.E.A.T. program participation; specifically, minority parents, parents with less than a high school education, and single-parents were more likely to withhold consent or to not respond (1999:323-324). Further, students whose parents provided affirmative consent held more prosocial attitudes, e.g., more positive attitudes about police, higher levels of perceived guilt for delinquency participation, lesser tendencies for impulsivity and lower delinquency rates than were students in the non-consent group. These differences, however, were not statistically significant in multivariate analyses in which demographic characteristics were controlled (Esbensen et al., 1999:329).

Panel Attrition

Any prospective panel longitudinal research design must contend with the problem of panel attrition, and this study is no exception. Those most likely to drop out

of studies (for whatever reason) are "participants from disorganized families, those who move often, those who are more frequently involved in the use of alcohol and drugs, and those engaged in criminal activities" (Junger-Tas and Marshall, 1999:315).

Thornberry and his associates (1993) discuss the consequences of respondent attrition, one of which is the possibility of biased parameter estimates. These authors identify several sources of attrition in panel studies. In addition to subject mortality and refusal, design elements that can affect respondent attrition include tracking effort intensity, reliance on institutionally-based samples, and number of contact attempts (Thornberry et al., 1993:128). The National Evaluation confronted issues posed by all of these sources. A few parents revoked their consent for their child's participation, and, although they had initially given their consent to participate voluntarily, some respondents revoked their consent in later waves; no respondents, however, had revoked their participation in Wave 1 and only one had revoked participation in the study by Wave 3, the two waves utilized in the dissertation analyses. At least one study participant died during the course of the evaluation.

The research team undertook a rigorous tracking procedure prior to and during each wave of data collection. Although they varied somewhat by wave and research site, tracking methods included the following: contacting school districts with lists of study participants to obtain any updated information contained in district databases such as current school enrollment, and current address and phone number; sending letters to students to remind them of the study's purpose, to notify them that the research team would be contacting them in the classroom or by mail, and to encourage their

participation; enlisting the aid of school administrative assistants to locate students who did not report to the survey administration location at the scheduled time; visiting schools several times to survey students who had been absent for one reason or another on the initial day of survey administration; making several trips to out-of-state research sites each data collection period; and mailing questionnaires to those students who had either moved out of the school district or with whom we were unable to make contact at school, such as those who were ill, truant, expelled, suspended, drop-outs, in off-campus educational and vocational programs, home-schooled, or institutionalized. Incentive techniques were also utilized to increase response rates and retain the sample. These varied for each wave of data collection, but included awarding pencils, pens, highlighters, rulers, key chains, or money for each completed survey.

Because ours was a school-based sample, we encountered difficulties due to both transition (from middle school to high school) and mobility (moving within or between school districts and cities). We chose to follow all students in the original sample, not just those who remained in the "study schools;" this approach has been demonstrated to reduce not only attrition, but also differences in substantive results (Thornberry et al., 1993:153). Specifically, attempting to retain all of the original sample lowers the risk of underestimating the prevalence and frequency of delinquency and overestimating prosocial orientations and behaviors.

For the pre- and post-tests, retention rates were 87 percent and 80 percent of the original sample of 3,568 students. For later waves, rates were 86 percent, 76 percent, 69 percent, and 67 percent of the active consent sample. In comparison with some

longitudinal studies, these retention rates were commendable. A meta-analysis of 85 longitudinal studies revealed an average retention rate of 72 percent for the 19 studies that had a 24-month follow-up period; few of these used multi-site samples (Hansen, Tobler, and Graham, 1990). Other researchers reported losing 41 percent of their sample between middle and high school (Tebes, Snow, and Arthur, 1992).

Instrument and Procedure

The survey instrument contained over 200 self-report items, including personal-biographical, attitudinal, and behavioral measures. For example, students answered questions concerning their perceptions of school safety; their attitudes toward school, police, and gangs; their friends' behaviors; and their own involvement in gangs, drugs, and delinquency. Measures of constructs drawn from social control, social learning, and routine activities theories—concepts that are covered in the G.R.E.A.T. curriculum—were built into the survey instrument to provide a conceptual framework for the evaluation (see Winfree et al., 1996 for a discussion).

Questionnaires generally were administered in group settings, with one member of the research team reading the questions out loud and at least one other team member walking about the classroom to facilitate classroom management and to answer any questions that students may have had. Prior to administration, students were reminded that their participation in the study was voluntary and that their answers would be kept confidential. As mentioned previously, other procedures were used to survey students who could not participate in these group administrations. If a student had transferred to a different school, for example, contact was made and permission obtained from the new

school's administration to excuse the student from class to complete the survey. A member of the research team then met with the study participant in a quiet location, such as the library or an administration office. The researcher explained the purpose and procedure of the survey, reminded the student of the voluntariness of participation, and then allowed the student to complete the survey on his or her own, sitting far enough away as to provide privacy, but available to answer any questions. In other instances, questionnaires were mailed to students, with a cover letter and postage-paid return envelope (one for the survey and one for a student information sheet used for tracking purposes).

Reliability and Validity of the Self-Report Method

In their work on the reliability and validity of self-reported and official delinquency, Hindelang, Hirschi, and Weis (1981:114) report that "reliability measures are impressive and the majority of studies produce validity coefficients in the moderate to strong range." Thus, these authors (1979:1009) conclude that "within the domain they tap, self-report measures provide reliable and valid indicators of offending behavior." A later review by Junger-Tas and Marshall (1999:355) provides further confirmation, indicating that self-report surveys are a "viable and valid way to measure criminal involvement, to test theory, and to identify correlates of individual differences in delinquency participation." Although the validity of the self-report method is still a topic of debate, there is evidence of greater validity of self-reported criminal activity among juvenile than adult samples (Junger-Tas and Marshall, 1999:323,331). In addition, "the

reliability of self-report scales is much less controversial" than is their validity (Junger-Tas and Marshall, 1999:345; Hindelang et al., 1981).

Huizinga (1991) provides information about the quality of self-reported delinquency, particularly violence and aggression. His review suggests that although most people will not underreport their involvement in these more serious offenses, these behaviors are potentially among those that pose the most serious reliability and validity problems. Thus, results from these measures should be viewed with caution: "although global measures of delinquency have proven to have relatively high levels of reliability, measures of aggression and violence may have somewhat more modest levels of reliability, and the accuracy of minor assault measures may be questionable" (Huizinga, 1991:57; Huizinga and Elliott, 1986). Further, there is mixed evidence of differential validity by race and by seriousness of offense (Huizinga, 1991:62).

Also important for the current study is that self-report data appears to be equally reliable and valid across sex (Sampson, 1985). Extending Hindelang and his associates' (1981) work, Sampson used multiple-group covariance structure models to compare the reliability of females' and males' self-reported delinquency prevalence and incidence. His research indicates approximately equal reliability for prevalence, and lower incidence reliabilities for females than males, leading him to suggest that in research on sex differences, use of prevalence measures may be preferable (1985:363-64). He does, however, acknowledge theoretical bases for the study of incidence measures, and argues that in research of this type, sacrifice of some reliability is justified (1995:364).

THE CURRENT STUDY

In order to maintain temporally correct causal ordering, i.e., that Time 1 variables affect Time 2 behavior, two waves of data from the longitudinal evaluation are employed: pre-test or Time 1 which was administered in Fall 1995 when students were in seventh grade (sixth at one site) and approximately eleven to thirteen years of age, and the year-one follow-up or Time 2 (Fall 1996), when students were in eighth (seventh at one site) grade and twelve to fourteen years of age. These two waves were chosen in order to avoid the confounding effects of transition from middle school to high school experienced in subsequent waves.

Census Data

To allow for the intended analyses of contextual effects, 1990 Census of Population and Housing, Summary Tape File 3-A data (U.S. Census Bureau, 1992, www.census.gov) from the six evaluation sites was merged with the individual-level data. According to Gottfredson and her associates (1991), studies using census data are often criticized as having inadequate measures of variables that *mediate* the effects of community structural characteristics on delinquency. These authors claim, however, that the "validity of census data for measuring the exogenous structural characteristics theorized by Shaw and McKay to increase crime rates has not been questioned" (Gottfredson et al., 1991:219). They argue that the findings of Simcha-Fagan and Schwartz (1986) in combination with the "large body of research connecting census-derived area characteristics to crime rates support the use of census-derived measures as measures of theoretically interesting structural characteristics of the area" (Gottfredson et

al., 1991:219). Thus, despite some concern, there is support of the quality and usefulness of census measures in criminological research of community-structural effects.

Prior research at the contextual level has generally been restricted to single sites with multiple neighborhoods defined as block-groups or census tracts (e.g., Cattarello, 2000; Rountree et al., 1994; Silver, 2000). In this research, contextual effects may potentially be operationalized at a variety of levels, including by city, by school, and by the more traditional block-group or census tract. The research described in this dissertation utilizes two levels: individual and census tracts. "Census tracts are small, relatively permanent statistical subdivisions of a county" that generally range between 2,500 and 8,000 persons (U.S. Census Bureau, 1990:10). They were originally designed to be relatively homogenous in terms of population characteristics, economic status, and living conditions (U.S. Census Bureau, 1990:10-11).

Definitional issues are the source of much debate in criminological research, and a key conceptual issue facing researchers of contextual effects and neighborhood social processes is the definition of "neighborhood" itself. Census tracts are commonly used in neighborhood research largely because census data are easily accessible and thus convenient to use. Some argue, however, that census tracts are unsatisfactory measures of "neighborhoods" (Tienda, 1991). Others argue their improvement over the use of larger zones, such as cities or school districts (Leventhal and Brooks-Gunn, 2000; South and Crowder, 1997). Leventhal and Brooks-Gunn (2000:312) point to the fact that census boundaries are drawn in cooperation with local officials and, as mentioned previously, an attempt is made to include defining physical features as well as to consider

social and racial or ethnic composition. In this way, census tracts are a better measure of "neighborhood" than are other administratively-delineated boundaries (e.g., police beats or postal areas such as zip codes). In addition, recent scholarship assessing residents' conceptions of their neighborhoods validates the use of the census tract as an adequate, although certainly not ideal, measure of neighborhood (Herrenkohl et al., in press; Sampson, 1997).

Geocoding Process

Respondents' 1995 home addresses were geocoded using Tele Atlas' EZLocate Client, Version 1.45 (available online at www.geocode.com). This software allows interactive use of Tele Atlas's *Eagle Geocoding Server*, which, for a fee, postally standardizes the user's addresses and appends geocodes, census codes, and postal codes. Etak is part of Tele Atlas North America, Inc., "the largest digital mapping company in the world" (Tele Atlas North America, Inc., 2001:n.p.).

Given the fact that students were drawn from middle schools, which presumably serve students in the general area surrounding the schools, it was expected that respondents would be clustered in relatively few census tracts containing and surrounding their schools. Contrary to this expectation, many census tracts were returned for each of the six sites, and many of those tracts had fewer than 10 survey respondents in each (for example, in Lincoln, 35 census tracts were represented, with the number of respondents in each ranging from one to thirty-four). Thus, close examination of the data was undertaken to ensure no mistakes had occurred in the geocoding process.

The addresses of the twenty-two middle schools from which the sample was drawn were geocoded and census tract location maps printed for each site (from the U.S. Census Bureau website, www.census.gov). This enabled comparisons of whether census tracts containing respondents' residences were located in the same general area of the city as the school census tracts, since most schools draw students from the surrounding neighborhoods. In situations in which students' residences appeared to be out of the area served by the school, further investigation occurred to ascertain whether a geocoding mistake had been made. This determination was made by double-checking students' addresses in the original databases; using local phone books to double-check street spellings and to look up parents' names and addresses; and using the U.S. Census Bureau's "street locater" (available on their website) to validate the census tract coding obtained through geocode.com. This latter process also allowed for coding of addresses that were returned un-matched by geocode.com.

Using these procedures, all cases were resolved (except for 28 addresses for which no match could be made); and any student who appeared to live outside of the area served by the school was presumed to be attending a school either for which he or she was not zoned or that had been selected on the basis of free choice. Lincoln Public Schools, for example, allows parents and students to self-select which schools children will attend. In addition to the possibility of free choice, the lack of clustering in Omaha can be explained by the school district's utilization of a bussing program that results in some students attending schools not near their residential neighborhoods (Omaha Public Schools, 1995). In Philadelphia, the apparent lack of clustering is likely due to the fact

that census tracts in this site are much smaller in terms of area than are tracts in the other five sites. Thus, students living in proximity to each other could be assigned to a single census tract in Las Cruces, Lincoln, Omaha, Portland, or Phoenix, while in Philadelphia, students living the same proximal distance from each other may be assigned to several different census tracts, even though they are the same geographical distance from each other as students in a single census tract in other sites.

Overall, 2,017 (99% of the active consent sample) students' addresses were successfully assigned to census tracts. The total number of census tracts across the six cities was 227, with the number of respondents in each tract ranging from one to sixty-two (see Table 4.1). Many of the census tracts (28%) contained only one respondent.

Table 4.1. Geocoding Results

City (number of respondents)	Match Rate	Non-matched addresses	Number of Tracts	Respondents per tract (range)	Tracts with 1 Respondent
Las Cruces (n = 301)	95%	16	15	1-62	3 (20%)
Lincoln (n = 425)	100%	0	35	1-35	7 (20%)
Omaha (n = 470)	99%	6	63	1-33	11 (18%)
Philadelphia (n= 228)	99%	2	57	1-23	25 (44%)
Phoenix (n = 300)	99%	2	22	1-57	9 (41%)
Portland (n = 321)	99%	2	35	1-38	8 (23%)
Total (n = 2045)	99%	28	227	1-62	63 (28%)

CURRENT SAMPLE

For survey respondents to be included in the dissertation research, it was necessary that several conditions be met. First, study participants' home addresses must have been successfully geocoded into census tracts. Second, to increase the reliability of HLM estimates and allow for some variability within census tracts on the independent and dependent variables, I included only respondents who resided in census tracts in which there were two or more respondents. Third, data from both time points (pre-test and year-one follow-up) must have been available for each respondent (i.e., a "complete data" sample).

Loss due to inadequate matches or non-matches during the geocoding process was 28 respondents (1.4% of the active consent sample); loss due to restricting census tracts was 63 respondents (3.1% of the active consent sample); and loss due to missing data at either Time 1 or Time 2 was 418 (20.4% of the active consent sample). The final sample size (restricted to those for whom data was available at Times 1 and 2 and who resided in census tracts in which there were two or more study respondents) was 1536, representing 75 percent of the 2045 active consent respondents and 156 (69%) of the 227 census tracts. For the dissertation, this complete data sample will be analyzed.

Chi-square tests and t-test of means comparisons were conducted to ensure that the sample used for the dissertation analyses did not differ significantly from those who were excluded from the dissertation analyses. These comparisons revealed several significant differences on demographic characteristics, but no differences on the independent and dependent variables of interest (see the next section in this chapter for

descriptions of how these variables were measured). Tables 4.2 and 4.3 contain the results from these comparisons.

Table 4.2. Demographic Differences between Dissertation and Excluded Samples

	Dissertation Sample (n = 1536)	Excluded Sample (n = 509)	Total (n = 2045)
Sex			
Females	52%	54%	53%
Males	48%	46%	47%
Age* **			
10-11	13%	12%	12%
12	64%	56%	63%
13-14	24%	31%	26%
Mean (S.D.)*	12.12 (.60)	12.21 (.70)	12.14 (.62)
Race/Ethnicity* **			
White	55%	43%	52%
African-American	14%	23%	17%
Hispanic/Latino	18%	15%	18%
Native American	3%	4%	3%
Asian	4%	4%	4%
Other/Mixed	6%	11%	7%
Family Structure* **			
Two-Parent	66%	51%	64%
Single-Parent	29%	40%	31%
Other Structure	5%	9%	6%

* $p \leq .05$, t-test of means comparison; *** $p \leq .001$, chi-square analyses

The dissertation sample was slightly younger than the excluded sample, more likely white and Hispanic, and less likely to report living in single-parent family structures. The excluded sample was more likely African-American and represented a traditionally more "at-risk" group than did the dissertation sample, in terms of being older and more likely from single-parent families.

These statistically significant demographic risk factors did not, however, translate into significant attitudinal and behavioral differences between the two samples. Although students included in the dissertation research were slightly more prosocial in terms of attitudes and behaviors than were excluded students, no statistically significant differences were found between the two samples (see Table 4.3).

Table 4.3. t-Test of Means Comparisons between Dissertation and Excluded Samples

	Dissertation Sample	Excluded Sample
Parental Attachment	5.12 (1.14)	5.21 (1.11)
Parental Monitoring	3.87 (0.76)	3.77 (0.77)
School Commitment	3.89 (0.69)	3.83 (0.73)
Guilt	2.64 (0.44)	2.60 (0.48)
Delinquent Peer Association	1.68 (0.71)	1.71 (0.69)
Serious Delinquency, Time 1	0.79 (5.93)	0.94 (4.31)
Serious Delinquency, Time 2	1.53 (7.71)	1.22 (7.54)[4]

Importantly, no significant differences were found in prevalence or frequency[5] of serious delinquency at Times 1 and 2. At Time 1 (seventh grade in five sites and sixth grade in the sixth site), 12 percent of the dissertation sample reported having committed at least one of the six serious offenses, compared to 16 percent of the excluded sample; at Time 2, 18 percent of both groups reported involvement (prevalence results not shown in table format). Although the frequency of serious delinquency differed between the two

[4] This mean represents all individuals for whom we had Time 2 data.
[5] Mean frequency, not lambda, is reported in the dissertation results.

groups, these differences were not significant at either Time 1 or Time 2. The lack of statistically significant differences on these key variables gives confidence that the results reported in this dissertation using the restricted sample (n = 1,536) can be considered valid for the entire sample of respondents (n = 2,045).

MEASURES

The dissertation draws on both individual-level data from the National Evaluation of G.R.E.A.T. and on 1990 census data. Individual-level responses provide measures of Level-1 predictors and the outcome measure, serious delinquency. Census data provide the Level-2 predictors, or contextual effects.

Level-1 (Individual-Level) Variables

Individual-level variables were drawn from the student questionnaire. All variables, except delinquent peer associations and the dependent delinquency items, were measured at Time 1. Due to the nature of the questions (i.e., "During the past year, how many of your current friends have done the following?" and "How many times in the past 6 months have you..."), delinquent peer associations and serious delinquency items were measured at Time 2 in order to establish correct temporal ordering.

Exploratory path analyses were conducted to determine the nature of the relationships hypothesized in the theoretical model and to test for significant interaction terms between sex and other predictor variables (Peterson, 2001b). These analyses suggested that the theoretical model operated for the most part in similar fashion for both girls and boys, but there were some significant sex interactions. Among the individual-level predictors of Time 2 serious delinquency, significant interaction terms were found

between sex and guilt and between sex and delinquent peer associations. Significant interaction terms between sex and several of the neighborhood-level variables (mobility, heterogeneity, percent single-parent families, and a composite measure of concentrated disadvantage) also confirmed the possibility that contextual factors may have differential effects by sex.

Demographics. The key demographic factor of interest, and one consistently demonstrated to correlate with delinquency, is sex. A dummy variable was constructed for inclusion in the analyses, and this variable ("female") was coded 0 for males and 1 for females. To focus on the main question of interest and to achieve a more parsimonious model, several other demographic factors known to correlate with delinquency were not included in the analyses. First, age is omitted because of the limited age range of the sample. Second, because race is not a focus of the dissertation, this measure is omitted; admittedly, race is a salient factor to be examined, but this issue will be left to future research. Finally, family structure is omitted; other research has shown that family structure exhibits no statistically significant effect when family process variables (e.g., attachment, supervision) are taken into account (Lynskey et al., 2000; Sampson and Lauritsen, 1994:26; Sokol-Katz, Dunham, and Zimmerman, 1997). For this research, parental attachment and monitoring are of greater interest than family structure.

Social control variables. The variables described in this section were drawn from the general social control perspective. The survey instrument contained selected variables from social bond and self-control theories, including measures of the following

concepts under examination in this research: attachment to parents, parental monitoring, and school commitment.

For parsimony in the analyses, a combined parental attachment scale was calculated for these analyses by summing maternal and paternal attachment scales. The original maternal and paternal attachment scales were created by summing a series of six paired semantic differential statements for each parent or parent-figure. For example, respondents were asked to indicate whether, on a scale of 7 to 1, "you (7) can talk to your mother/father about anything" or "you (1) can't talk to your mother/father about anything." (See Appendix A for the remainder of these and all other scale items.) Higher scores on these scales indicate stronger attachments of youths to parents. These items resulted in highly reliable scales for both mother (α = .83 for total sample, .85 for females, and .81 for males) and father (α = .87 for total sample, .87 for both females and males). The composite parental attachment measure was created as follows: if respondents provided answers to both maternal and paternal attachment questions, their scores for both scales were summed and divided by two. If respondents answered only one set of questions (The instructions read, "If you do not have a mother/father or mother-/father-figure, you can leave these questions blank."), their score on the completed scale was used as their measure of parental attachment. All students answered at least one set of attachment questions.

The parental monitoring scale derived from four items; respondents were asked the extent to which they (1) disagreed or (5) agreed with such statements as, "My parents know where I am when I am not at home or at school." The higher the scale score, the

greater the level of monitoring experienced by the respondent. Cronbach's alpha for this scale for the total sample was 0.70 (α = .72 for females and .67 for males).

The school commitment scale consisted of level of agreement to six items; for example, "Homework is a waste of time" and "Grades are very important to me." A seventh related question asked, "If you had to choose between studying to get a good grade on a test or going out with your friends, which would you do?" Responses to one item (the first question) were recoded to be consistent with responses of the other scale items. The scale ranges from 1 ("strongly disagree") to 5 ("strongly agree"), and again, higher scores denote greater commitment to the societal institution of education. This scale appeared to be reliable (α = .79 for total sample, .80 for females, .76 for males).

Social learning variables. The survey instrument contained a number of measures of social learning concepts. Included in these analyses are measures of respondents' level of perceived guilt for potential delinquency and their association with delinquent peers. Youths who report high levels of guilt are less likely to engage in delinquency than those who report low levels, and youths who have more rather than fewer associations with peers who are delinquent are more likely to engage in delinquent behavior themselves.

The guilt scale was made up of sixteen items assessing perceived guilt for engaging in a variety of behaviors ranging from skipping school without an excuse to attacking someone with a weapon to using marijuana and other drugs. This scale ranges from 1 ("not very guilty/badly") to 3 ("very guilty/badly"). Higher scores denote greater

expected guilt for misbehavior, and this scale was highly reliable (α = .94 for total sample, .93 for females, and .95 for males).

Youths' associations with delinquent peers were measured by a sixteen-item scale. Respondents indicated how many of their current friends had engaged in a variety of delinquent activities during the past year. Responses range from 1 ("none of them") to 5 ("all of them"), and higher scores on this scale represent greater delinquent peer association. This scale was highly reliable (α = .94 overall; α = .92 for girls and .95 for boys). Again, because of the nature of the question ("during the past year"), this variable is measured at Time 2, in order to maintain correct temporal ordering with the dependent variable.

Other statistical controls. In addition to controlling for the key demographic characteristic (sex), statistical controls for subjects' prior delinquency and city of residence were also introduced. As demonstrated in prior research, prior delinquency is a strong predictor of later delinquency. Thus, in order not to confound this relationship with other Level-1 predictors and, more importantly, so that predictive power was not taken from the theoretical variables of interest, Time 1 delinquency was regressed on all other predictors, and its residual saved. This residual was then used in the HLM analyses in place of the Time 1 delinquency variable itself (Roncek, 1997).

Dummy variables for five of the sites (with Lincoln as the excluded category) were also included in the models to determine whether city of residence was important to consider. None of these variables exhibited a significant effect on delinquency, nor did the coefficients of the other variables change in any appreciable manner by their

inclusion or exclusion. For parsimony, then, the dummy variables for site were not included in the final analyses.

Dependent variable: Serious delinquency. Implicit in the social disorganization perspective is the notion of consensus about the wrongfulness of certain behavior. Bursik has argued, however, that "the social disorganization framework does not seem suitable for the study of all behaviors that have been designated as criminal...(for example) for many, less serious offenses a strong degree of consensus does not exist" (1988:535). Research on perceived seriousness of crime indicates a high level of consensus about the wrongfulness of serious offenses (Brown, Esbensen, and Geis, 1996:6). For these reasons, Bursik and Grasmick (1993:21) chose to focus their study of their systemic theory on those crimes for which there is a high degree of consensus (those corresponding to the UCR's Index offenses). This study uses the same rationale in its focus on serious delinquency, in addition to the current concern with serious and violent offending in the public and political eye.

In addition, because both official and self-report data show that the gap between females' and males' involvement in delinquency is greater as crime seriousness and frequency of offending increases (Campbell, 1990:44; Canter, 1982b; Cernkovich and Giordano, 1979; Espiritu, 1998), it is useful to focus attention on more serious misbehaviors. It is also true that sex ratios vary by race or ethnicity; for example, sex ratios are smaller among African-Americans than among whites (Hindelang et al., 1981:139). Examination of sex by race differences, however, is beyond the scope of the dissertation and will be explored in future research. Because some studies have found

differential effects of independent variables on type of delinquency by sex, it is also appropriate to disaggregate delinquency for the analysis rather than use a general delinquency scale (see Hindelang et al., 1981). With these considerations in mind, this study attends to the problem of serious delinquency among girls and boys. The serious delinquency scale is comprised of six offenses that would be classified according to the Uniform Crime Reports as Part I or Index crimes: stealing items worth more than $50, burglary, motor vehicle theft, attacking someone with a weapon, robbery, and shooting at someone.[6] (See Chapter Five for results comparing girls and boys on these individual measures.)

Disaggregating by prevalence and incidence also addresses two potentially different theoretical issues: the decision to engage in a behavior and the decision to continue in that behavior. Paternoster and Triplett's (1988) research, however, indicates little difference in the effects of various theoretical predictors on these two outcomes, and prior research has shown that greater sex differences are seen in frequency than in prevalence of delinquency. Thus, although prevalence rates of serious offending will be reported for both sexes, frequency of serious offending by girls' and boys will be the dependent variable in the analyses.

Several authors have noted a criticism of previous research on social disorganization theory: the reliance on official data to determine rates of community crime and delinquency (e.g., Bursik, 1988). Biases in official data are well-documented

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[6] It is possible that some aggravated assault incidents are double-counted by the inclusion of both "attacking someone with a weapon" and "shooting at someone." Although the former implies more personal assault, such as that with a knife, and the latter implies a distance factor, we have no way of knowing how students interpreted these items. Thus, results should be viewed with caution.

(O'Brien, 1985) and, as research has demonstrated, these biases are particularly salient when attempting to research male-female differences in delinquency (e.g., Cernkovich and Giordano, 1979; Espiritu, 1998). Use of official data in multilevel analyses can also be problematic in that police discretionary behavior may be dependent upon the context; "thus, what may appear to be a contextual effect in a model using such records may actually reflect the operation of an unmeasured variable (the use of police discretion) that is strongly correlated with the neighborhood context" (Bursik and Grasmick, 1996:250-251; see also Sampson, 1986). Thus, a strength of this study is its use of self-reported delinquency measures; although not without biases of their own, self-report measures have been shown to be reliable and valid (Hindelang, Hirschi, and Weis, 1979, 1981; Huizinga, 1991; Huizinga and Elliott, 1986; Junger-Tas and Marshall, 1999).

Students were asked, "How many times in the last six months have you...?" and allowed open-ended responses. The responses to the six serious offenses noted above were summed to create an index of serious delinquency. Two respondents had implausible scores (one over 1,000, the other over 5,000), and their responses were coded as missing. This serious delinquency index ranges from zero to 105 at Time 1 and from zero to 133 at Time 2. Time 1 mean delinquency is .79 (SD = 5.93), and Time 2 mean delinquency is 1.53 (SD = 7.71). Because this dependent variable is highly skewed, with many zero responses, HLM 5 with overdispersed Poisson (constant exposure) was used to examine frequency of offending.

Level-2 (Census-Tract-Level) Variables

Census tract characteristics from tracts containing youths' Time 1 residences (Fall 1995) were drawn from the 1990 Census, Summary Tape File 3-A (see Appendix B for STF 3-A table number, names, and universe). These data were downloaded from the Census Bureau website at www.census.gov into Microsoft Excel, then converted into a usable format and imported into an SPSS file in which variables were created for use in the HLM5 statistical package.

Initially, eleven variables drawn from prior research were calculated from the census data. These included five measures of socioeconomic status and/or class: poverty (proportion of persons living below the federal poverty level), welfare (proportion of households receiving public assistance), unemployment (proportion of persons 16 and over who were unemployed), occupation (proportion of persons employed persons 16 and over employed in professional or managerial positions), and higher education (proportion of persons 18 and over whose level of education extended beyond high school). Three housing measures were calculated: vacant (proportion of housing units that were vacant), severe overcrowding (proportion of occupied housing units with more than 1.5 persons per room), and dwelling unit density (proportion of housing units that were high density housing, such as apartments).

Mobility was measured by the proportion of persons aged five and over not living in the same house as five years ago. Neighborhood racial composition was measured by the proportion of the population that was African-American. Finally, one family-related measure was calculated: single-parent families (proportion of families headed by a single

parent). The zero-order correlations between these census-derived variables are presented in Appendix C.

A point of note regarding these census-based variables is that it is not my intention in this dissertation to delineate the neighborhood factors specifically related to delinquency, that is, to disentangle the effects of race, family structure, and poverty. It is my intention to determine only whether neighborhood factors as a whole are directly and/or indirectly linked to individual delinquency, what individual- or family-level processes may intervene, and whether the proposed theoretical model operates in a similar or dissimilar fashion for girls and boys. Thus, because so many of the census tract variables are highly correlated (see Appendix C for the correlation matrix), factor analysis was conducted to determine the degree to which these eleven variables represented a single, underlying construct. The results indicated that the variables described above load on three separate components (see Tables 4.4 and 4.5).

Table 4.4. Factor Analysis of Census Variables: Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %
1	5.90	53.64	53.64	4.00	36.35	36.35
2	1.86	16.92	70.56	2.91	26.42	62.76
3	1.01	9.15	79.71	1.86	16.95	79.71
4	0.67	6.09	85.80			
5	0.58	5.25	91.05			
6	0.36	3.32	94.37			
7	0.22	1.99	96.35			
8	0.17	1.51	97.86			
9	0.12	1.05	98.91			
10	0.01	0.58	99.49			
11	0.01	0.51	100.00			

NOTE: Extraction Method: Principal Component Analysis.

Overall, these three components account for about 80 percent of the variance (see Table 4.4). As shown in Table 4.5, the neighborhood variables that loaded on the first component were Poverty, Unemployment, Welfare, African-American, and Single-parent Families. Vacant units also loaded on this component, but, as described later, was excluded from the analyses. Loading on the second component were Professional/Managerial, Higher Education, and Overcrowding. Finally, Unit Density and Mobility loaded on the third component.

Table 4.5. Factor Analysis of Census Variables: Factor Loadings

	Component		
	1	**2**	**3**
Poverty	.754	.544	.140
Unemployment	.666	.587	.007
Welfare	.840	.386	-.010
Professional/Managerial	-.219	-.848	.155
Higher Education	-.441	-.801	.257
Vacant	.594	.355	.502
Overcrowding	.229	.698	.347
Unit Density	.005	-.102	.803
African-American	.927	.005	-.213
Single-parent Families	.866	.361	.007
Mobility	-.151	.002	.820

NOTES: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

Based on the findings from this factor analysis and my review of the social disorganization literature, I decided to create two composite measures and to utilize three variables as independent measures. First, following Sampson, Raudenbush, and Earls (1997:920), five variables were combined into a measure of "concentrated disadvantage": poverty, unemployment, welfare, proportion African-American, and proportion single-parent families. These variables exhibited high correlations with one another (see Table

C2 in Appendix C). In addition, exploratory OLS regression analyses with collinearity diagnostics (Variance Inflation Factors and the Condition Index) indicated multicollinearity between these five variables. Attempts to disentangle their effects from each other using the method described by Roncek (1997) were unsuccessful (i.e., residualization and replacement of variables with their residuals in the equations did not eliminate multicollinearity). Confirmatory factor analysis with varimax rotation determined that these indicators of neighborhood disadvantage represented a single underlying factor. Second, professional/managerial occupation and higher education were combined into a single measure of education/occupation. These two were highly correlated (see Appendix Table C2) and also loaded on the same factor in confirmatory factor analysis.

Following Elliott and his colleagues (1996) and Sampson and Groves (1989), these two neighborhood measures (Concentrated Disadvantage and Education/Occupation) were created by summing the z-scores for the variables. The concentrated disadvantage scale ranged from –5.38 to 17.78 ($\bar{x}$ = -.98, SD = 3.89), and the education/occupation scores ranged from –4.08 to 5.94 ($\bar{x}$ = .03, SD = 1.93). Both scales proved highly reliable (α = .94 for concentrated disadvantage, and α = .93 for education/occupation). Higher scale scores indicated greater concentrated disadvantage and higher proportions of residents with some college or more and in professional or managerial occupations.

For the remaining four census-derived variables described above, various procedures of inclusion or exclusion were used. First, although proportion vacant units

loaded on the disadvantage factor, I did not include this variable in creating this factor, as it was not highly correlated (at $r \geq 0.70$) with any of the other disadvantage measures. Overcrowding loaded on the same factor as education/occupation, but I estimated the effect of this variable independently. Similarly, mobility and unit density loaded together, but since these variables were not highly correlated ($r = .46$), I estimate their effects separately.

HIERARCHICAL LINEAR MODELING

Hawkins, Laub, and Lauritsen (1998:40) warn us against committing the "individualistic fallacy," rightly pointing out that individual-level correlations "may be partly spurious and confounded with community- or macrolevel context." That is, individuals reside in neighborhoods, and neighborhood characteristics may in part be responsible for what appear to be individual-level effects. Hierarchical linear modeling (HLM) was developed to handle such "nested" data that violate the assumptions of ordinary least squares regression (Bryk and Raudenbush, 1992). In the present research project, individuals are "nested" within neighborhoods, and individuals who live in certain neighborhoods are likely to be more similar to each other than to individuals living in other neighborhoods, due either to individual selection effects or to "generative neighborhood effects" (Elliott et al., 1996:395). Thus, observations are not independent of each other, and there is the possibility of correlated errors, a violation of the assumptions of ordinary least squares (OLS) regression analysis (Berry, 1993; Lewis-Beck, 1980). Thus, using OLS regression to analyze nested data can result in underestimated standard errors and biased coefficients.

HLM allows analysis of individual-level data that is also grouped into larger units; thus, it is appropriate for the purposes of this research project. Use of the HLM procedure provides three general benefits to researchers: "improved estimation of effects within individual units..., the formulation and testing of hypotheses about cross-level effects..., and the partitioning of variance and covariance components among levels" (Bryk and Raudenbush, 1992:5). In addition, it is capable of handling unbalanced data (e.g., in this research, there is an unequal number of respondents across census tracts). Bayesian estimates are used to account for differences in measurement reliability across neighborhoods associated with the number of respondents in each unit and their consistency in reporting (Bryk and Raudenbush, 1992).

General Equations in HLM

Analyses were conducted using the statistical package HLM 5 (Bryk, Raudenbush, and Congdon, 2000; Raudenbush, Bryk, Cheong, and Congdon, 2000). Because the dependent variable, serious delinquency, was highly skewed for both girls and boys, an overdispersed Poisson model with constant exposure was employed. The Level-1 Poisson model form is

$$E(Y_{ij} \mid \beta_j) = \gamma_{ij} \text{ and } VAR(Y_{ij} \mid \beta_j) = \gamma_{ij},$$

where γ_{ij} is the "true" rate of serious delinquency for respondent *ij*. The general Level-1 equation for Poisson HLM is as follows:

$$\text{Log(Delinquency)}_{ij} = \beta_{0j} + \beta_{1j}X_{ij},$$

where X_{ij} is a vector of Level-1 predictors, and β_{0j} and β_{1j} are Level-1 regression coefficients. As Bursik and Grasmick note, "the central difference from traditional

specification is that the equation is estimated separately within each of the *j* contexts, leading to *j* values of the regression coefficients for each of the explanatory variables" (1996:248). In this random-coefficient regression model, each context (in this case, census tract) has its own regression equation with an intercept and a slope (Bryk and Raudenbush, 1992:67). Results from the Level-1 model include the average regression equation within neighborhoods, variability among the regression equations, variance explained at Level-1, and the correlation between the intercept and the slope (1992:67).

In the Level-2 equation, regression coefficients from Level-1 become the dependent variables:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} W_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} W_j + \mu_{1j},$$

where β_{0j} and β_{1j} are the coefficients estimated for each of the *j* groups in Level-1, and W_j is the level of a series of compositional variables in group *j*. In the first equation, γ_{00} is the grand mean of the original Y_{ij} (delinquency), and the γ_{10}s that are in the other Level-2 equations are the grand means of the *j* regression coefficients (from the Level-1 independent variables). "The γ coefficients, therefore, represent the effect of the contextual variables on the direction and magnitude of the first-stage regression coefficients" (Bursik and Grasmick, 1996:249). Thus, for the purposes of the dissertation, the slopes of the Level-1 predictor variables are dependent upon the contextual variables, i.e., the census tract characteristics.

By incorporating these two levels, HLM maintains the assumptions of linearity and normality, and "(i)nferences concerning the existence of contextual effects are made

on the basis of a decomposition of the variance into within-context and between-contexts components" (Bursik and Grasmick, 1996:249). It is thus possible to determine what proportion of variance in serious delinquency exists within a census tract (the individual-level results) and between census tracts (neighborhood-level results).

Centering

Having a meaningful value for the Level-1 intercept eases interpretation and in some cases may be required to ensure "numerical stability in estimating hierarchical linear models" (Bryk and Raudenbush, 1992:25; Kreft and De Leeuw, 1998). In addition, interpretation of Level-2 intercepts depends on the location of the W_j variables. "The numerical stability of estimation is not affected by the location for the Ws, but a suitable choice will ease interpretation of results" (1992:25). Bryk and Raudenbush (1992:26-28) describe four common choices for centering or not centering the independent variables: the natural metric of the variable, centering around the grand mean, centering around the group mean, and using other theoretically-derived locations. They also suggest that, although not as important, it is often useful to center all Level-2 predictors around their corresponding grand means (1992:29).

For the dissertation analyses, Level-1 predictors were centered around their group means, and these group means were then added uncentered to the Level-2 equation for the intercept. For this latter step, it was necessary to calculate census tract means for each of the predictor variables outside of the HLM software (in SPSS) and include these group means as Level-2 variables in constructing the HLM data file (Snijders and Bosker, 1999:242). Level-2 predictors were centered around their grand means. As touched

upon earlier, group-mean centering of Level-1 predictors has several advantages: 1) it eases interpretation of results, especially for variables with differing metrics; 2) it removes high correlations between random intercepts and slopes and also between first- and second-level variables and cross-level interactions; and 3) it "stabilizes" the model (Kreft and De Leeuw, 1998:114; Kreft, de Leeuw, and Aiken, 1995). In fixed coefficient models, group-mean centering, with group means added back in at Level-2, decomposes compositional and contextual effects, separating between-group variation from within-group variation (Bryk and Raudenbush, 1992:122; Kreft et al., 1995:5), which is of interest in this research.

The equations with Level-1 predictors group-mean centered and added back into the Level-2 equation for the intercept are as follows:

$$\text{Log(Delinquency)}_{ij} = \beta_{0j} + \beta_{1j}(X_{ij} - \bar{X}_{.j})$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\bar{X}_{.j})_j + \gamma_{02}W_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}\,.$$

In this case $(X_{ij} - \bar{X}_{.j})$ is the deviation of a respondent's score on the Level-1 predictors from his or her neighborhood's mean on these predictors.

Mediating Effects in HLM

In prior research with the G.R.E.A.T. data, the integrated model developed by Winfree and his colleagues (1996) was tested using path analysis (Lynskey, Taylor, Esbensen, and Winfree, 1999; see too Peterson, 2001b). Perhaps a more appropriate technique would be Structural Equation Modeling (SEM), which, unlike traditional path

analysis, can take measurement error into account. The most currently available HLM program (HLM 5) does not have the capability to model mediating effects at the Level-1 stage (Raudenbush, 2001), and this limitation precludes the type of path analysis or structural equation modeling depicted in the theoretical model proposed in Chapters Two and Three. There are at least three alternative approaches to explore such relationships using HLM. First, the paths can be ignored and all individual-level predictors analyzed simultaneously in the Level-1 stage of the HLM analysis. Second, one may conduct path-analytic repeated regressions with each step including the next dependent variable in the model and controlling for prior variables. Using this method, direct and indirect effects can be estimated; as already mentioned, however, this method is limited in that standard errors cannot be estimated (Raudenbush, 2001).

Third, individual-level responses can be aggregated to represent census tract or other neighborhood-level predictors (see, e.g., Elliott et al., 1996; Raudenbush and Sampson, 1999a; Sampson and Groves, 1989; Sampson, Raudenbush, and Earls, 1997). In this approach, mediating effects can be estimated at the higher levels (either Level-2 or Level-3), while Level-1 serves as the measurement model, to describe measurement error in aggregating responses to represent latent variables of interest (Raudenbush and Sampson, 1999a; 1999b). Raudenbush and Sampson (1999b:4-5) discuss item response models and the generalizability theory that underlie the logic of latent variable analysis to handle measurement error in aggregating individual-level responses for use in hierarchical linear models. HLM utilizes all available information for valid inference of data missing if a respondent was not available for all survey administrations or refused or

neglected to respond to certain questions. One limitation of utilizing this third approach in the present study is that respondents were not randomly sampled from census tracts, and thus, their aggregated responses may not be representative of their neighborhoods' true scores.

In the present research, following Cattarello (2000) in large part, I used an approach that is a combination of the first two methods. In a manner similar to path analysis, I estimated the effects of the neighborhood (Level-2) variables on the individual (Level-1) theoretical variables and on delinquency. I also estimated the effects of the Level-1 variables on delinquency. Thus, I first estimate main effects of neighborhood variables on social control and learning variables, and, second, I estimate the main effects of neighborhood variables on delinquency. Next, direct effects of both neighborhood and individual variables on delinquency are estimated. These analyses provide an indication of which Level-1 variables mediate which neighborhood effects on delinquency. Although indirect effects can be detected in this manner, the magnitude of these effects cannot be calculated because HLM does not provide standardized coefficients.

ANALYTICAL PLAN

The analyses begin with descriptive sample statistics for key individual demographic variables (although, as explained in a previous section, not all are controlled in the HLM analyses): sex, age, race/ethnicity, and family structure, for both girls and boys. These analyses included frequencies, means, standard deviations, and zero-order correlations between variables. (See Appendix C for the zero-order correlation matrices for the independent variables.) Next, girls and boys were compared on all key individual-

level independent and dependent variables. To determine if there were any statistically significant differences between the sexes on these measures, chi-square and t-test of means analyses were conducted as appropriate.

Next, descriptions of census tracts are provided, including the number of census tracts used in the analyses, the number of respondents within each tract, and how tracts vary on key characteristics included in the Level-2 model. The six sites used in the analyses are compared to each other and also to the national mean in terms of census tract characteristics.

Hierarchical analyses and their results are then described. To facilitate this discussion, the hypotheses to be tested, the equations used to test them, and the results from the analyses are provided in sequence in Chapter Five. Hypothesis 1, for example, is stated, followed by the equation used to test Hypothesis 1; results from this test are next presented. This systematic procedure is used to describe all of the hierarchical analyses of the relationships hypothesized in Chapter Three.

Chapter Five describes the findings from these analyses. Discussion of these findings, conclusions drawn from them, and their implications for the field are found in Chapter Six.

CHAPTER FIVE:

FINDINGS

This chapter discusses findings from all analyses described in Chapter Four. Individual and census tract characteristics are provided first, along with relevant comparisons (chi-square and t-test of means) of girls and boys on key variables. Next, hypotheses tested with HLM and the equations used to test them are discussed, including the results of each of these analyses.

RESPONDENT CHARACTERISTICS

Demographic characteristics of the individual respondents are depicted in Table 5.1. Although not all are controlled in later analyses, these characteristics are reported to give the reader a picture of the sample. Significant differences between girls and boys were found for age and race/ethnicity. As mentioned in a previous chapter, this sample is young, with an average age of twelve, and girls are slighter younger than boys. The majority (55%) of the sample is white, but as the table shows, the sample is diverse in terms of race and ethnicity; girls are slightly less likely white than are boys in the sample. One-third of the sample reported living in single-parent family structures, and there were no significant differences by sex for this measure.

Table 5.1. Individual Respondent Sample Characteristics

	Females (n = 801)	Males (n = 735)	Total (n = 1536)
Age			
10-11	13%	11%	12%
12	65%	62%	64%
13-14	22%	26%	24%
Mean (S.D.)*	12.09 (.59)	12.16 (.61)	12.12 (.60)
Race/Ethnicity			
White	52%	58%	55%
African-American	15%	14%	14%
Hispanic/Latino	19%	18%	18%
Native American	3%	2%	3%
Asian	4%	3%	4%
Other/Mixed	8%	5%	6%
Family Structure			
Two-Parent	67%	66%	66%
Single-Parent	28%	29%	29%
Other Structure	5%	6%	5%

*$p \leq .05$

Significant differences emerged between girls and boys for five out of six individual-level independent variables (see Table 5.2). In each of these instances, girls were more "pro-social" than boys in their attitudes and behaviors. Girls experienced higher levels of parental monitoring than did boys, they were more highly committed to school, they perceived more guilt for potential deviance, they associated with fewer delinquent peers, and they were less frequently involved than were boys in serious delinquency at Time 1. Boys reported slightly greater attachment to parents than did girls, but this difference was not significant.

Table 5.2. t-Test of Means Comparisons by Sex on Independent and Dependent Variables

	Females	Males
Parental Attachment	5.10 (1.14)	5.14 (1.14)
Parental Monitoring**	4.00 (0.73)	3.71 (0.75)
School Commitment**	4.00 (0.66)	3.77 (0.70)
Guilt**	2.71 (0.39)	2.57 (0.48)
Delinquent Peer Association**	1.57 (0.60)	1.80 (0.80)
Serious Delinquency, Time 1**	0.34 (3.76)	1.31 (7.63)
Serious Delinquency, Time 2**	0.35 (1.85)	2.83 (10.88)

**$p \leq .01$

The annual prevalence of serious offending at Time 1 was 12 percent overall (results not shown in table form). At Time 2, 18 percent of youths in this sample reported having engaged in serious delinquency; this represents an increase in annual prevalence for both girls and boys, from seven to 11 percent for girls and from 17 to 25 percent for boys. For both time periods, the sex difference in annual prevalence was significant ($p = .001$). As shown in Table 5.2, girls were also significantly less frequently involved in serious offending than boys, and their increases in annual delinquency frequency were not as great as boys' between Times 1 and 2. Annual prevalence and frequency differences in the six items making up the serious delinquency index were also examined, and these results are presented in Table 5.3.

Table 5.3. Comparisons by Sex of Individual Delinquency Items, Time 1 and Time 2

	Prevalence, Time 1 (Overall = 12%)		Prevalence, Time 2 (Overall = 18%)	
	Girls	Boys	Girls	Boys
Stole > $50	1.3%*	5.5%	1.9%*	11.9%
Burglary	4.0%*	9.2%	6.3%*	15.4%
Auto theft	1.5%	2.7%	3.1%*	7.6%
Attack w/weapon	1.5%*	6.9%	3.1%*	11.9%
Robbery	0.9%*	2.9%	1.5%*	6.3%
Shoot at someone	0.3%	1.0%	1.0%*	5.2%
Index prevalence	7.0%*	17.0%	11.0%*	25.0%

	Frequency, Time 1 Mean (SD) (Overall = 0.79(5.93))		Frequency, Time 2 Mean (SD) (Overall = 1.53(7.71))	
	Girls	Boys	Girls	Boys
Stole > $50	.04 (.59)*	.17 (0.97)	.03 (0.28)*	.56 (2.49)
Burglary	.12 (.84)*	.48 (4.26)	.13 (0.84)*	1.12 (6.02)
Auto theft	.04 (.49)	.20 (3.81)	.04 (0.29)*	.23 (1.77)
Attack w/weapon	.06 (.95)*	.30 (1.76)	.11 (1.17)*	.52 (4.17)
Robbery	.03 (.42)	.18 (2.37)	.02 (0.17)*	.34 (2.11)
Shoot at someone	.04 (1.01)	.05 (0.80)	.03 (0.31)*	.29 (2.65)
Index frequency	0.34 (3.76)*	1.31 (7.63)	.35 (1.85)*	2.83 (10.88)

*$p \leq .05$

Fewer significant differences were found at Time 1 than at Time 2. At Time 1, there were no differences between girls and boys in their rates of auto theft, robbery, or shooting at someone. These behaviors also exhibited the lowest prevalence rates, as would be expected for youths whose average age was 12. Burglary was the most prevalent and frequent serious offense for both girls and boys, although girls' rates were lower than boys' rates. For girls, the next most prevalent offenses at both time points

were auto theft and attacking someone with a weapon; for boys, attacking someone and stealing items worth more than $50 were next most prevalent. Behind burglary, the next most frequent offense for girls was attacking someone, followed by auto theft (Time 2); for boys, stealing (Time 2) and attacking someone (Time 1 and Time 2) were the next most frequent offenses. Thus, although significant differences are present between girls' and boys' prevalence and frequency of crime involvement, their patterns of involvement are similar.

An earlier study by the G.R.E.A.T. Evaluation team used a different sample of eighth-graders and assessed prevalence rates for the past twelve months for girls and boys: 10.1 percent for girls and 18 percent for boys for attacking someone with a weapon; 3 percent (girls) and 9 percent (boys) for robbery; and 2.3 percent (girls) and 7.7 percent (boys) for shooting at someone (Deschenes and Esbensen, 1999:79). Although these rates are not directly comparable (since the current study assesses delinquency for the past six months) to the results reported for Time 2 delinquency (when respondents were in 8th-grade) in Table 5.3, the results reported by Deschenes and Esbensen (1999) lend some credibility to the relatively high rates of offending in this study.

A self-report study of delinquency at school revealed that 6.3% of sixth- to eighth-graders reported having threatened another student with a gun, knife, or club during the 1996-97 school year, and 4.2% had hurt a student using one of these weapons (Maguire and Pastore, 1998:227). Since these reports cover only incidents that occurred on school grounds, it is reasonable to assume that the actual prevalence of these behaviors is higher, in that some perpetration of offenses likely occurred off school

grounds as well. It is also important to keep in mind that these offenses are self-defined by the respondents. That is, the offense is whatever the respondent thinks it is; there was no effort to follow-up on these responses to determine what specific actions the respondents included in their definitions of the particular behavior.

CENSUS TRACT CHARACTERISTICS

Table 5.4 describes the 156 census tracts examined in this research in terms of the eleven neighborhood variables and the two indexes used in the analyses. The national mean is provided as a point of comparison.

For the most part, the census tracts in the six sites included in this research are similar to the nation in terms of these characteristics. There are, however, some differences. The sample census tracts are less heterogeneous compared to the nation. One-third of the families in the sample census tracts are headed by a single parent, compared to one-fourth of families at the national level (although this sample macro-level statistic is consistent with the statistic reported by the individual respondents in the sample). Further, the census tracts in this research exhibit less concentrated disadvantage than the nation and lower proportions of persons with higher education and professional or managerial occupations.

Table 5.4. Census Tract Characteristics (Proportions)

		All 6 Sites (n = 156)		
	National Mean	Mean (SD)	Min	Max
Poverty	.13	.17 (.12)	.00	.80
Welfare	.08	.09 (.09)	.00	.74
Unemployment	.04	.05 (.03)	.00	.18
Professional/Managerial	.26	.25 (.11)	.01	.67
Higher Education	.45	.49 (.17)	.09	.86
Vacant	.10	.08 (.05)	.00	.27
Overcrowded	.02	.01 (.02)	.00	.10
Unit Density	.14	.13 (.14)	.00	1.02
Mobility	.47	.50 (.11)	.00	.79
Heterogeneity	.34	.20 (.15)	.00	.64
African-American	.12	.13 (.25)	.00	.99
Single-parent Families	.23	.30 (.18)	.00	1.00
Concentrated Disadvantage	-.22	-.98 (3.89)	-5.38	17.78
Education/Occupation	.22	.03 (.02)	-4.08	5.94

NOTE: Because of the manner in which Unit Density is calculated, it is possible for the value of this variable to exceed 1.

Looking at the minimum and maximum values of these variables (in Table 5.4) indicates a wide range across the census tracts in the six sites. These characteristics also vary within as well as across the six cities used in the analyses, and the means and distributions of these variables are shown in Table 5.5.

Table 5.5. Census Tract Characteristics by Site

	Poverty				Unemployment				Welfare			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Las Cruc	.21	.08	.12	.41	.06	.01	.03	.08	.09	.04	.02	.21
Lincoln	.06	.05	.00	.29	.02	.01	.00	.05	.03	.02	.00	.09
Omaha	.16	.13	.02	.48	.04	.03	.01	.13	.08	.08	.00	.43
Philly	.31	.18	.09	.80	.08	.04	.00	.18	.23	.17	.00	.74
Phoenix	.18	.07	.07	.28	.05	.02	.02	.09	.07	.03	.03	.14
Portland	.20	.09	.04	.40	.05	.02	.02	.10	.12	.06	.02	.25
National	.13				.04				.08			

Table 5.5 (cont'd)

	Professional/Managerial				Higher Education				Mobility			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Las Cruc	.29	.07	.10	.50	.48	.10	.17	.79	.52	.09	.37	.70
Lincoln	.35	.11	.14	.53	.67	.11	.35	.86	.51	.12	.32	.79
Omaha	.23	.11	.01	.67	.46	.18	.17	.86	.48	.12	.27	.76
Philly	.24	.14	.03	.56	.31	.17	.09	.78	.36	.11	.00	.60
Phoenix	.18	.05	.10	.24	.42	.08	.29	.55	.52	.08	.41	.78
Portland	.19	.06	.11	.37	.42	.11	.28	.69	.53	.05	.38	.63
National	.26				.45				.47			

Table 5.5 (cont'd)

	Vacant				Overcrowding				Unit Density			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Las Cruc	.08	.03	.03	.13	.02	.02	.01	.10	.05	.05	.00	.32
Lincoln	.04	.03	.01	.14	.002	.003	.00	.01	.12	.11	.00	.52
Omaha	.07	.04	.00	.18	.005	.007	.00	.03	.16	.15	.00	1.02
Philly	.13	.06	.00	.27	.02	.02	.00	.08	.10	.15	.00	.88
Phoenix	.11	.05	.05	.24	.03	.01	.00	.06	.23	.18	.00	.74
Portland	.06	.02	.02	.22	.02	.01	.00	.05	.09	.09	.00	.48
National	.10				.02				.14			

Table 5.5 (cont'd)

	Heterogeneity				Percent African-American				Single-parent Families			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Las Cruc	.18	.09	.06	.33	.02	.01	.00	.04	.25	.09	.16	.43
Lincoln	.06	.04	.01	.19	.01	.02	.00	.06	.16	.11	.00	.47
Omaha	.18	.13	.02	.57	.16	.28	.00	.99	.33	.19	.06	.91
Philly	.23	.20	.00	.64	.64	.37	.00	.98	.57	.25	.00	1.00
Phoenix	.31	.09	.14	.48	.05	.02	.02	.10	.30	.10	.18	.55
Portland	.33	.13	.09	.57	.13	.15	.00	.62	.35	.12	.13	.64
National	.34				.12				.23			

Table 5.5 (cont'd)

	Concentrated Disadvantage				Education/Occupation			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Las Cruc	-1.060	1.43	-3.12	2.68	.31	1.17	-3.20	3.98
Lincoln	-4.050	1.25	-5.28	.22	1.94	1.54	-1.68	4.68
Omaha	-1.090	3.98	-5.19	11.93	-0.36	1.98	-4.05	5.94
Philly	5.610	5.97	-5.38	17.78	-1.13	2.10	-4.08	4.16
Phoenix	-1.090	1.40	-3.79	1.04	-1.06	0.90	-2.40	.12
Portland	-0.001	0.03	-3.73	6.47	-0.98	1.17	-2.51	1.84
National	-0.220				.22			

The general pattern is that Lincoln census tracts appear most advantaged and Philadelphia most disadvantaged; this is the case with Poverty, Unemployment, Welfare receipt, Higher Education, Vacancy rate, proportion African-American, Single-parent Families, and, not surprisingly, the composite measures of Concentrated Disadvantage and Education/Occupation. Philadelphia contains the most disadvantaged census tracts in the sample also in terms of Unit Density. Further, Philadelphia census tracts have the least mobile population of the sites; this, coupled with low economic status, hints at the "entrenchment" of the underclass described by Wilson (1987). In terms of the extent to which their respective census tracts are characterized by Concentrated Disadvantage, the sites are ranked in the following order from greatest to least disadvantage:
1) Philadelphia, 2) Portland, 3) Las Cruces, 4) Omaha and Phoenix, and 5) Lincoln.

Another way to compare the variation across sites is to look at site characteristics compared to the national average. On the economic variables, for example, Lincoln's rates of Poverty, Unemployment and Welfare receipt are half the national average, while Philadelphia's rates are two (Unemployment) to three (Poverty and Welfare) times the national mean. Both Philadelphia and Portland fall above the national average on the composite Disadvantage measure, while the other four sites are less disadvantaged compared to the national average.

Variation in these characteristics within sites is sometimes drastic. Here again, Philadelphia has the greatest range within site of all the sites on a majority of the variables (Poverty = .71; Unemployment = .18; Welfare = .74; Vacancy rate = .27; Mobility = .60; Heterogeneity = .64; Single-parent Families = 1.00; Concentrated

Disadvantage = 23.16). It is second behind Omaha in its range across its census tracts on Higher Education and percent African-American (.69 and .98, respectively, compared to .70 and .99 in Omaha).

The above description of neighborhood characteristics drawn from census data reveals variation not only across the six sites included in the analyses, but also across the census tracts within sites. If neighborhood context is in fact important in understanding and predicting individual delinquency, these neighborhood data should allow enough variation for examination of contextual effects.

HIERARCHICAL ANALYSES

To address the hypothesized relationships described in Chapter Three using HLM, a series of hypotheses must be tested. These hypotheses and the equations used to test them are described in order in this section, along with the results from their respective analyses. Hypotheses 1 through 3 address the overall fit and ability of the integrated theoretical model to explain delinquency. Hypotheses 4 and 5 address whether the model operates in similar or different fashion for girls and boys.

Hypothesis 1: Frequency of serious delinquency will vary across the census tracts in this study.

A one-way analysis of variance (ANOVA) model with random effects is useful as a preliminary analysis to determine 1) how much variation in the outcome (delinquency, as well as the individual-level variables that are used as dependent variables in some analyses) lies within and between contexts (neighborhoods), and 2) the reliability of each neighborhood's sample mean as an estimate of its true population mean (Bryk and

Raudenbush, 1992:61). Once the variability of regression equations across contexts has been estimated, an explanatory model can be built to account for that variability.

Thus, the first step in the HLM analyses is to determine whether there is variability in delinquency across neighborhoods. If there is not, there is no need to use hierarchical modeling techniques; ordinary least squares regression would be appropriate. The first equation is a one-way ANOVA model with the Level-1 Poisson model form

$$\text{Log}(\text{Delinquency}_{ij}) = \beta_{0j} .$$

In this unconditional equation, β_{0j} is the mean outcome for unit j (Bryk and Raudenbush, 1992). The Level-2 equation then becomes

$$\beta_{0j} = \gamma_{00} + \mu_{0j} ,$$

where γ_{00} is the grand mean of delinquency for the population and μ_{0j} is the random effect associated with unit j, assumed to have a mean of zero and variance τ_{00}. Substituting the Level-2 equation into the Level-1 equation, the combined model is

$$\ln(\text{Delinquency}_{ij}) = \gamma_{00} + \mu_{0j} .$$

If variance in delinquency across neighborhoods is present (as indicated by a significant chi-square associated with the Level-2 parameter variance, τ_{00}), models can then be built to explain that variation. As shown in the first row of Table 5.6, the between-neighborhood variance component for delinquency is significantly different from zero, indicating that level of serious offending does vary by neighborhood. The average neighborhood mean for frequency of serious delinquency (results not shown in table format) was estimated at 0.18 ($p = .17$). The Level-1 variance (or "pooled within-

neighborhood variance") was 16.97, and the variance among the neighborhood means was .74.

Table 5.6. One-way ANOVA Analyses

Outcome	Between-Neighborhood Variation (τ_{00})	Within-Neighborhood Variation (σ^2)
Serious Delinquency	.743**	16.973
Parental Monitoring	.011**	.526
School Commitment	.015**	.437

**$p \leq .01$

The proportion of total variance in delinquency that is between neighborhoods (the "intraclass correlation") can also be calculated from the results of this analysis by using the following formula: $\rho = \tau_{00} / (\tau_{00} + \sigma^2)$, where σ^2 is the Level-1 (within-neighborhood) variance and τ_{00} is the Level-2 (between-neighborhood) variance. The intraclass correlation indicates the amount of variance in serious delinquency that is between neighborhoods; thus, it denotes the maximal amount of total variance in delinquency that is explainable by neighborhood factors (Bryk and Raudenbush, 1992:18, 95). In this case, that value is four percent ($\rho = .042$).

Also included in Table 5.6 (rows two and three) are the results of the analyses to determine whether any of the key Level-1 theoretical variables vary by neighborhood (see Hypothesis 3A). I will return to the reasons for and the results from these two one-way ANOVA analyses in a later section. For now, the focus is on the first one-way ANOVA model: Since delinquency varies significantly by neighborhood, the next step is to incorporate Level-1 (individual-level) predictors to determine whether the

hypothesized relationships between these independent variables and serious delinquency are supported and whether the variation in delinquency across neighborhoods is fully accounted for by the individual-level variables.

Hypothesis 2A: Sex (being female), Parental Attachment, Parental Monitoring, School Commitment, and Guilt will significantly and negatively affect serious delinquency; Delinquent Peer Associations will significantly and positively affect serious delinquency.

Hypothesis 2B: Although they will help to explain variation in serious delinquency, individual-level variables (i.e., demographics, social control, and social learning factors) will not fully explain this variation; that is, after inclusion of all individual-level predictors in the Level-1 model, significant parameter variance will remain.

The Level-1 equation to test these two hypotheses is as follows (recall that each Level-1 predictor is group-mean centered):

$$\text{Log}(\text{Delinquency}_{ij}) = \beta_{0j} + \beta_{1j}(\text{Female})_{ij} + \beta_{2j}(\text{Paratt})_{ij} + \beta_{3j}(\text{Parmon})_{ij} + \beta_{4j}(\text{Schcom})_{ij} + \beta_{5j}(\text{Guilt})_{ij} + \beta_{6j}(\text{Peerdel})_{ij} + \beta_{7j}(\text{T1delq})_{ij} .$$

At Level-2, the equations are

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{Paratt})_j + \gamma_{03}(\text{Grp}\bar{\times}\text{Parmon})_j + \gamma_{04}(\text{Grp}\bar{\times}\text{Schcom})_j + \gamma_{05}(\text{Grp}\bar{\times}\text{Guilt})_j + \gamma_{06}(\text{Grp}\bar{\times}\text{Peerdel})_j + \gamma_{07}(\text{Grp}\bar{\times}\text{T1delq})_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \mu_{2j}$$
$$\beta_{3j} = \gamma_{30} + \mu_{3j}$$
$$\beta_{4j} = \gamma_{40} + \mu_{4j}$$
$$\beta_{5j} = \gamma_{50} + \mu_{5j}$$
$$\beta_{6j} = \gamma_{60} + \mu_{6j}$$

$$\beta_{7j} = \gamma_{70} + \mu_{7j} .$$

Note that these slope equations ($\beta_{1j}...\beta_{7j}$) include error terms (μ_j); the analyses described below revealed that these effects would need to be fixed or nonrandomly varying rather than random. As described previously, Level-1 variables were group-mean centered, their group means were added back in to the Level-2 model, and the coefficients associated with the Level-1 predictors were initially allowed to vary randomly. None of the regression slopes associated with the Level-1 predictors, however, exhibited significant random variability across neighborhoods. Thus, the error terms were omitted from the Level-2 slope equations. The combined equation is as follows:

$$\begin{aligned}\ln(\text{Delinquency}_{ij}) = {} & \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{Paratt})_j + \gamma_{03}(\text{Grp}\bar{\times}\text{Parmon})_j + \gamma_{04}(\text{Grp}\bar{\times}\text{Schcom})_j + \gamma_{05}(\text{Grp}\bar{\times}\text{Guilt})_j + \gamma_{06}(\text{Grp}\bar{\times}\text{Peerdel})_j + \\ & \gamma_{07}(\text{Grp}\bar{\times}\text{T1delq})_j + \gamma_{10}(\text{Female})_{ij} + \gamma_{20}(\text{Paratt})_{ij} + \gamma_{30}(\text{Parmon})_{ij} + \\ & \gamma_{40}(\text{Schcom})_{ij} + \gamma_{50}(\text{Guilt})_{ij} + \gamma_{60}(\text{Peerdel})_{ij} + \gamma_{70}(\text{T1delq})_{ij} + \mu_{0j} .\end{aligned}$$

This "fixed effects" model assumes that the relationships between the independent and dependent variables are similar in each neighborhood. Table 5.7 presents the results obtained from estimating this reduced model.

As hypothesized, sex and school commitment were negatively associated with youths' frequencies of serious delinquency; girls and youths who were more highly committed to school reported lower rates of serious offending than did boys and those less committed to the institution of education. Also consistent with Hypothesis 2A, greater association with deviant peers meant a higher frequency of offending. Contrary to this hypothesis, however, parental attachment, parental monitoring, and guilt were not

found to be significantly related to serious offending, although the relationships were in the expected directions. Therefore, Hypothesis 2A is only partially supported.

Table 5.7. Level-1 Model Predicting Delinquency

	Coefficients	**Se**	
Intercept, γ_{00}	0.64	2.79	
Fixed Effects			
Individual-level			
Female, γ_{10}	-1.38**	.20	
Parental attachment, γ_{20}	0.14	.08	
Parental monitoring, γ_{30}	0.05	.11	
School commitment, γ_{40}	-0.11**	.14	
Guilt, γ_{50}	-0.34	.17	
Delinquent peers, γ_{60}	1.44**	.08	
Time 1 delq (residual), γ_{70}	0.01	.01	
Neighborhood-level			
Grp$\bar{x}$ Female, γ_{01}	-2.46**	.78	
Grp$\bar{x}$ Paratt, γ_{02}	-0.23	.34	
Grp$\bar{x}$ Parmon, γ_{03}	-0.22	.55	
Grp$\bar{x}$ Schcom, γ_{04}	0.68	.51	
Grp$\bar{x}$ Guilt, γ_{05}	-0.90	.91	
Grp$\bar{x}$ Peerdel, γ_{06}	0.73	.47	
Grp$\bar{x}$ T1delq, γ_{07}	-0.03	.06	
Random Effects	**Variance Components**	**df**	χ^2
Between, τ_{00}	0.81**	152	464.29
Within, σ^2	6.18		

**$p \leq .01$

A proportional reduction in variance by the addition of Level-1 variables (or "variance explained" by the Level-1 variables) can be calculated by comparing the estimated variance of the one-way ANOVA model to the variance obtained in the Level-1 model, using the formula found in Bryk and Raudenbush (1992:70):

$$\text{Proportional variance explained at L1} = \frac{\sigma^2(\text{ANOVA}) - \sigma^2(\text{Level-1})}{\sigma^2(\text{ANOVA})}.$$

Using values from Tables 5.6 and 5.7, the equation is (16.973 – 6.18) / 16.973 = .636. Adding the individual-level predictors reduced the within-neighborhood variance in delinquency by 64 percent; stated another way, these variables account for about 64 percent of the individual-level variation in delinquency.

Supporting Hypothesis 2B, significant variance in delinquency across neighborhoods remained after accounting for the Level-1 predictors; consequently, Hypothesis 3 was next tested.

Hypothesis 3: The effects of neighborhood-level variables on serious delinquency will be mediated, in full or in part, through the effects of the individual-level variables (parental monitoring, school commitment, perceived guilt, and delinquent peer association).

Four subhypotheses were derived to test Hypothesis 3. First, it must be verified that the individual theoretical predictors (which are used as dependent variables in some of the following analyses) have variance across neighborhoods that is explainable by neighborhood factors. Second, the individual variables serve as dependent variables in equations with neighborhood variables and sex as independent variables; in this way, the effects of context on "mediating" variables can be estimated. Third, the main effects of neighborhood variables on delinquency are estimated. Finally, the direct effects of all neighborhood and individual variables on delinquency are estimated. This set of analyses will provide an indication of which neighborhood effects are mediated by which individual-level theoretical factors.

Hypothesis 3A: Four Level-1 theoretical variables will have significant variation that is explainable by neighborhood factors.

Recall from Chapter Three that I am not hypothesizing that parental attachment differs across neighborhoods; thus, only parental monitoring, school commitment, guilt, and delinquent peer association are examined in Hypothesis 3.[7] Variation in Level-1 variables is determined in the same manner as was variation in delinquency, by a series of fully unconditional (one-way ANOVA) models with each of the Level-1 variables as the dependent variables. Because these variables are normally distributed, and not skewed as is the delinquency dependent variable, standard HLM is used. An example of these equations is as follows:

Level-1 equation: $\text{Parmon}_{ij} = \beta_{0j} + r_{ij}$

Level-2 equation: $\beta_{0j} = \gamma_{00} + \mu_{0j}$.

If the parameter variance associated with parental monitoring or any of the other three Level-1 variables is significant, these variables exhibit variation across census tracts. Thus, explanations for variation in these variables can be explored using neighborhood-level variables.

As already presented in Table 5.6, two of the four variables exhibited significant variation: parental monitoring ($\rho = .020$) and school commitment ($\rho = .033$). The average neighborhood means for these variables were 3.90 ($p = .000$) and 3.92 ($p = 0.000$), respectively (results not in table format). Therefore, the effects of neighborhood factors on these two Level-1 variables are next estimated. Hypothesis 3A is supported

only in part (i.e., two variables did not exhibit significant variation across neighborhoods), and Hypothesis 3B, which was originally that each neighborhood factor would have a significant effect on each Level-1 variable, must be modified and tested accordingly.

Hypothesis 3B: Each neighborhood-level variable will have significant effects on the two Level-1 variables that vary across neighborhoods.

This hypothesis is tested by including the neighborhood variables in the Level-2 equation for the intercept (the combined model follows the Level-1 and Level-2 equations):

$$\text{Level-1: } (\text{Parmon/Schcom})_{ij} = \beta_{0j} + \beta_{1j}(\text{Female})_{ij} + r_{ij}$$

$$\text{Level-2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female}) + \gamma_{02}(\text{Mobility})_j + \gamma_{03}(\text{Unitdens})_j + \gamma_{04}(\text{Ovrcrwd})_j + \gamma_{05}(\text{Disadv})_j + \gamma_{06}(\text{Educ/Occ})_j + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10}.$$

With substitution, the combined equation becomes

$$(\text{Parmon/Schcom})_{ij} = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female})_j + \gamma_{02}(\text{Mobility})_j + \gamma_{03}(\text{Unitdens})_j + \gamma_{04}(\text{Ovrcrwd})_j + \gamma_{05}(\text{Disadv})_j + \gamma_{06}(\text{Educ/Occ})_j + \gamma_{10}(\text{Female})_{ij} + \mu_{0j} + r_{ij}.$$

For the analyses, first, the five Level-2 variables were included in the equations predicting parental monitoring and school commitment (with no Level-1 predictors included). Next, the same analyses were run controlling for sex (see Table 5.8). In the first set of analyses, no significant effects resulted from the equation for parental monitoring, and only concentrated disadvantage was important in explaining variation in school commitment. This variable, interestingly, was positively associated with school

[7] To confirm my assertion, a one-way ANOVA was conducted with parental attachment as the dependent

commitment; the greater the neighborhood disadvantage, the higher the level of school commitment.[8]

Table 5.8. Neighborhood-Level Effects on Individual-Level Predictors, Controlling for Sex

	Parental Monitoring			School Commitment		
	Coefficients	**Se**		**Coefficients**	**Se**	
Intercept, γ_{00}	3.58**	0.08		3.85**	0.07	
Fixed Effects						
Individual-level						
Female, γ_{10}	0.24**	0.04		0.23**	0.04	
Neighborhood-level						
Grp$\bar{x}$ Female, γ_{01}	0.56**	0.14		0.16	0.13	
Mobility, γ_{02}	0.25	0.22		0.32	0.22	
Unit density, γ_{03}	-0.12	0.17		0.06	0.17	
Overcrowding, γ_{04}	-1.80	1.63		-0.54	1.59	
Conc disadv, γ_{05}	-0.01	0.01		0.02**	0.01	
Educ/occup, γ_{06}	0.02	0.02		0.01	0.01	
Random Effects	**Variance Components**	**df**	χ^2	**Variance Components**	**df**	χ^2
Between, τ_{00}	0.01	153	171.91	0.01**	153	196.52
Within, σ^2	0.51			0.42		

**$p \leq .01$; robust standard errors

In the second set of analyses that included sex as a predictor (Table 5.8), concentrated disadvantage exhibited a significant effect, again, only on school commitment, and again, this effect was positive. This unanticipated finding may be related to research showing greater school commitment among African-American youths, who are also more likely than white youths to reside in disadvantaged neighborhoods. This possibility is discussed further in Chapter Six.

variable; the chi-square associated with the variance component was not significant.

[8] Bivariate correlations also revealed that each of the five variables comprising Disadvantage was positively related to school commitment.

These results do not offer much support for Hypothesis 3B; only one of the five neighborhood variables exhibited an effect, and this was on only one of the two Level-1 theoretical variables. The next step in the analyses was to estimate the main effects of neighborhood variables on delinquency.

Hypothesis 3C: Each neighborhood-level variable will have a significant main effect on frequency of serious delinquency.

For this analysis, a Poisson regression model is used, with delinquency as the dependent variable, neighborhood variables entered into the Level-2 equation for the intercept, and sex as a control variable:

$$\text{Level-1: } \text{Log}(\text{Delinquency}_{ij}) = \beta_{0j} + \beta_{1j}(\text{Female})_{ij} + \beta_{2j}(\text{T1delq})_{ij}.$$

$$\text{Level-2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{T1delq})_j + \gamma_{03}(\text{Mobility})_j + \gamma_{04}(\text{Unitdens})_j + \gamma_{05}(\text{Ovrcrwd})_j + \gamma_{06}(\text{Disadv})_j + \gamma_{07}(\text{Educ/Occ})_j + \mu_{0j}.$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}.$$

The combined model, then, is

$$\ln(\text{Delinquency}_{ij}) = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{T1delq})_j + \gamma_{03}(\text{Mobility})_j + \gamma_{04}(\text{Unitdens})_j + \gamma_{05}(\text{Ovrcrwd})_j + \gamma_{06}(\text{Disadv})_j + \gamma_{07}(\text{Educ/Occ})_j + \gamma_{10}(\text{Female})_{ij} + \gamma_{20}(\text{T1delq})_{ij} + \mu_{0j}.$$

This is referred to as a "means-as-outcomes" regression model (Bryk and Raudenbush, 1992:64). Respondents' rates of delinquency vary around their neighborhood means (the Level-1 equation), and each neighborhood's mean rate of delinquency is predicted by the specific neighborhood variables (the Level-2 equation). The results for this model are presented in Table 5.9.

Table 5.9. Neighborhood Main Effects on Delinquency, Controlling for Sex and Prior Delinquency

	Coefficient	Se	
Intercept, γ_{00}	1.03*	0.37	
Fixed Effects			
Individual-level			
Female, γ_{10}	-2.26*	0.25	
Time 1 Delq (residual), γ_{20}	-0.03*	0.01	
Neighborhood-level			
Grp$\bar{x}$ Female, γ_{01}	-3.02*	0.74	
Grp$\bar{x}$ T1delq, γ_{02}	-0.01	0.08	
Mobility, γ_{03}	2.05	1.34	
Unit density, γ_{04}	-0.12	1.10	
Overcrowding, γ_{05}	-27.55*	11.44	
Concentrated disadvantage, γ_{06}	0.03	0.04	
Education/occupation, γ_{07}	-0.07	0.09	
Random Effects	**Variance Components**	**df**	χ^2
Between, τ_{00}	0.77*	152	291.32
Within, σ^2	10.97		

*$p \leq .05$

Only one of the five neighborhood variables (Overcrowding) had a significant effect on delinquency, and this effect was negative. The higher the neighborhood rate of overcrowding (i.e., the higher the proportion of household units with more than 1.5 persons per room), the lower the frequency of serious delinquency or, conversely, the lower the proportion of overcrowded units, the higher the delinquency frequency. The rather large b coefficient associated with this variable is due to the low variance across census tracts in the proportion of housing units that are severely overcrowded (see Tables 5.4 and 5.5). As in the analyses presented in Table 5.8, sex also has a significant and negative effect: being female is associated with lower frequency of serious offending, even when neighborhood factors are taken into account. Thus, regardless of neighborhood characteristics, girls commit fewer serious offenses than do boys.

The proportional reduction in variance or "variance explained" at Level-2 can also be calculated by using values from Tables 5.6 and 5.9:

$$\text{Proportional variance explained in } \beta_{0j} = \frac{\tau(\text{ANOVA}) - \tau(\text{Level-1})}{\tau(\text{ANOVA})}$$

(Bryk and Raudenbush, 1992:65). Using the values from the equation that did not include sex as a predictor, the variance explained is calculated as follows: (.743 - .635) / .743 = .145. Therefore, it can be said that these neighborhood-level variables account for 14 to15 percent of the between-neighborhood variation in serious offending.

We now know that concentrated disadvantage exhibits a significant effect on school commitment and that overcrowding has a significant effect on serious offending. Next, the direct effects of these variables, the other neighborhood-level variables, and all Level-1 predictors were estimated to test Hypothesis 3D.

Hypothesis 3D: Neighborhood variables will exhibit direct effects on delinquency, while controlling for individual-level variables.

To test this final part of Hypothesis 3, the Level-1 equation is

$$\text{Log}(\text{Delinquency}_{ij}) = \beta_{0j} + \beta_{1j}(\text{Female})_{ij} + \beta_{2j}(\text{Paratt})_{ij} + \beta_{3j}(\text{Parmon})_{ij} + \beta_{4j}(\text{Schcom})_{ij} + \beta_{5j}(\text{Guilt})_{ij} + \beta_{6j}(\text{Peerdel})_{ij} + \beta_{7j}(\text{T1delq})_{ij},$$

and at Level-2, the equations are

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Grp} \bar{\times} \text{Female}) + \gamma_{02}(\text{Grp} \bar{\times} \text{Paratt}) + \gamma_{03}(\text{Grp} \bar{\times} \text{Parmon}) + \gamma_{04}(\text{Grp} \bar{\times} \text{Schcom}) + \gamma_{05}(\text{Grp} \bar{\times} \text{Guilt}) + \gamma_{06}(\text{Grp} \bar{\times} \text{Peerdel}) + \gamma_{07}(\text{Grp} \bar{\times} \text{T1delq}) + \gamma_{08}(\text{Mobility})_j + \gamma_{09}(\text{Unitdens})_j + \gamma_{010}(\text{Ovrcrwd})_j + \gamma_{011}(\text{Conc Disadv})_j + \gamma_{012}(\text{Educ/Occ})_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

$\beta_{5j} = \gamma_{50}$
$\beta_{6j} = \gamma_{60}$
$\beta_{7j} = \gamma_{70}$.

Thus, the combined equation is as follows:

$$\ln(\text{Delinquency}_{ij}) = \gamma_{00} + \gamma_{01}(\text{Grp} \times \text{Female})_j + \gamma_{02}(\text{Grp} \times \text{Paratt})_j + \gamma_{03}(\text{Grp} \times \text{Parmon})_j + \gamma_{04}(\text{Grp} \times \text{Schcom})_j + \gamma_{05}(\text{Grp} \times \text{Guilt})_j + \gamma_{06}(\text{Grp} \times \text{Peerdel})_j + \gamma_{07}(\text{Grp} \times \text{T1delq})_j + \gamma_{08}(\text{Mobility})_j + \gamma_{09}(\text{Unitdens})_j + \gamma_{010}(\text{Ovrcrwd})_j + \gamma_{011}(\text{Disadv})_j + \gamma_{012}(\text{Educ/Occ})_j + \gamma_{10}(\text{Female})_{ij} + \gamma_{20}(\text{Paratt})_{ij} + \gamma_{30}(\text{Parmon})_{ij} + \gamma_{40}(\text{Schcom})_{ij} + \gamma_{50}(\text{Guilt})_{ij} + \gamma_{60}(\text{Peerdel})_{ij} + \gamma_{70}(\text{T1delq})_{ij} + \mu_{0j} .$$

If any of the neighborhood factors exhibits a significant effect when all other variables are included in the analysis, a "direct effect" on delinquency is present. Of course, this applies to individual-level factors as well. Results from this analysis are found in Table 5.10.

When the Level-1 predictors are included in the model, the effect of severe overcrowding does not diminish. Overcrowding still has a negative and direct effect on delinquency (and, again, the large b coefficient is due to the low variance on this variable). None of the other neighborhood variables, however, exhibits a significant direct effect on delinquency. Thus, only partial support for Hypothesis 3D was found. Some of the individual-level predictors, however, did have the predicted direct effects on youths' frequency of delinquency. As in previous models, sex was negatively related to delinquency and association with delinquent peers was positively related. Interestingly, school commitment is no longer important, and guilt now has a negative effect not found in previous models. When neighborhood context is taken into account, the lower the level of guilt perceived by the youth, the higher the frequency of serious offending (a

relationship that was predicted); but, when neighborhood context is taken into account, level of school commitment does not significantly influence delinquency.

Table 5.10. Direct Effects of Individual- and Neighborhood-Level Variables on Delinquency

	Coefficients	Se	
Intercept, γ_{00}	0.47	2.77	
Fixed Effects			
Individual-level			
Female, γ_{10}	-1.39*	0.20	
Parental attachment, γ_{20}	0.14	0.08	
Parental monitoring, γ_{30}	0.05	0.11	
School commitment, γ_{40}	-0.11	0.14	
Guilt, γ_{50}	-0.36*	0.17	
Delinquent peers, γ_{60}	1.44*	0.08	
Time 1 Delq (residual), γ_{70}	0.01	0.01	
Neighborhood-level			
Grp$\bar{x}$ Female, γ_{01}	-2.16*	0.77	
Grp$\bar{x}$ Paratt, γ_{02}	-0.05	0.35	
Grp$\bar{x}$ Parmon, γ_{03}	-0.62	0.57	
Grp$\bar{x}$ Schcom, γ_{04}	0.71	0.57	
Grp$\bar{x}$ Guilt, γ_{05}	-0.74	0.90	
Grp$\bar{x}$ Peerdel, γ_{06}	0.82	0.49	
Grp$\bar{x}$ T1delq, γ_{07}	-0.03	0.06	
Mobility, γ_{08}	0.85	1.28	
Unit density, γ_{09}	0.69	1.05	
Overcrowding, γ_{010}	-31.36*	10.71	
Concentrated disadvantage, γ_{011}	0.03	0.05	
Education/occupation, γ_{012}	-0.04	0.09	
Random Effects	**Variance Components**	**df**	χ^2
Between, τ_{00}	0.69*	147	371.98
Within, σ^2	6.27		

*$p \leq .05$

The effects of the individual-level predictors were not altered in any significant manner by the addition of neighborhood-level predictors. Compared to their coefficients in the Level-1 model (without any Level-2 predictors), the effects of parental attachment,

parental monitoring, school commitment, and delinquent peer association were the same; the effect of sex increased, but by only .01; and the effect of guilt decreased by .02. The changes were more substantial among the Level-2 variables. Although the effect of concentrated disadvantage remained the same when the Level-1 variables were introduced, the effect of education/occupation increased by .01, and each of the other three effects decreased: mobility by 1.04, unit density by .83, and overcrowding by 3.88. Given the fact that few of these relationships are statistically significant, these changes mean little.

The proportion of variance explained between neighborhoods was seven percent over the unconditional (one-way ANOVA) model (Table 5.6), and the proportional reduction in variance within-neighborhoods was 63 percent over the unconditional model. The full model described in Table 5.10 provided a 15 percent reduction in between-neighborhood variation in delinquency over the Level-1 model (Table 5.7),[9] but it did not provide any between-neighborhood reduction in delinquency variance over the Level-2 model. Similarly, the full model provided an almost 43 percent proportional reduction in within-neighborhood variation over the Level-2 model described in Table 5.9,[10] but did not provide any within-neighborhood reduction in delinquency variance over the Level-1 model presented in Table 5.7. These results indicate that individual-level variables are responsible for reduction in within-neighborhood, but not between-neighborhood, variation in delinquency; and neighborhood-level variables are responsible for reduction in between-neighborhood, but not within-neighborhood, variation.

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[9] (.81 – .69) / .81 = .148

Taking all of these subhypothesis analyses into account, what can be concluded about Hypothesis 3? I found that concentrated disadvantage had a significant positive main effect on school commitment. The hypothesis that neighborhood disadvantage is related to delinquency through school commitment, however, is not supported for two reasons: first, the effect of disadvantage on school commitment is positive, not negative, as hypothesized; second, school commitment was not found to be significantly related to delinquency. Overcrowding was the only variable having both main and direct effects on delinquency, but this relationship was opposite of what was expected. Thus, the overall conclusion must be that Hypothesis 3 was not supported; although some significant effects of neighborhood factors were found, it is not the case that the effects neighborhood context on delinquency are mediated by parent, school, and peer variables.

These limited findings regarding the effects of neighborhood factors on individual delinquency (and on individual attitudinal measures) do not proffer much optimism for support of the next set of hypotheses. Nevertheless, the main question of interest in this dissertation is whether the theoretical model proposed operates in similar or differential fashion for girls and boys, and it is to these analyses that I now turn.

Hypothesis 4: Significant cross-level interactions will be found between each of the neighborhood-level variables and sex.

To test for cross-level interactions between neighborhood-level variables and sex, the neighborhood variables are included not only in the Level-2 equation for the Level-1 intercept, but also in the equation for the slope of sex:

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[10] (10.90 – 6.27) / 10.90 = .425

L1: $\text{Log}(\text{Delinquency}_{ij}) = \beta_{0j} + \beta_{1j}(\text{Female})_{ij} + \beta_{2j}(\text{Paratt})_{ij} + \beta_{3j}(\text{Parmon})_{ij} + \beta_{4j}(\text{Schcom})_{ij} + \beta_{5j}(\text{Guilt})_{ij} + \beta_{6j}(\text{Peerdel})_{ij} + \beta_{7j}(\text{T1delq})_{ij}$.

L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{ Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{ Paratt})_j + \gamma_{03}(\text{Grp}\bar{\times}\text{ Parmon})_j + \gamma_{04}(\text{Grp}\bar{\times}\text{ Schcom})_j + \gamma_{05}(\text{Grp}\bar{\times}\text{ Guilt})_j + \gamma_{06}(\text{Grp}\bar{\times}\text{ Peerdel})_j + \gamma_{07}(\text{Grp}\bar{\times}\text{ T1delq})_j + \gamma_{08}(\text{Mobility})_j + \gamma_{09}(\text{Unitdens})_j + \gamma_{010}(\text{Ovrcrwd})_j + \gamma_{011}(\text{Disadv})_j + \gamma_{012}(\text{Educ/Occ})_j + \mu_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{Mobility})_j + \gamma_{12}(\text{Unitdens})_j + \gamma_{13}(\text{Ovrcrwd})_j + \gamma_{14}(\text{Disadv})_j + \gamma_{15}(\text{Educ/Occ})_j$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$.

Substituting the Level-2 equations into the Level-1 equation gives

$\ln(\text{Delinquency}_{ij}) = \gamma_{00} + \gamma_{01}(\text{Grp}\bar{\times}\text{ Female})_j + \gamma_{02}(\text{Grp}\bar{\times}\text{ Paratt})_j + \gamma_{03}(\text{Grp}\bar{\times}\text{ Parmon})_j + \gamma_{04}(\text{Grp}\bar{\times}\text{ Schcom})_j + \gamma_{05}(\text{Grp}\bar{\times}\text{ Guilt})_j + \gamma_{06}(\text{Grp}\bar{\times}\text{ Peerdel})_j + \gamma_{07}(\text{Grp}\bar{\times}\text{ T1delq})_j + \gamma_{08}(\text{Mobility})_j + \gamma_{09}(\text{Unitdens})_j + \gamma_{010}(\text{Ovrcrwd})_j + \gamma_{011}(\text{Disadv})_j + \gamma_{012}(\text{Educ/Occ})_j + \gamma_{10}(\text{Female})_{ij} + \gamma_{11}(\text{Mobility})_j(\text{Female})_{ij} + \gamma_{12}(\text{Unitdens})_j(\text{Female})_{ij} + \gamma_{13}(\text{Ovrcrwd})_j(\text{Female})_{ij} + \gamma_{14}(\text{Disadv})_j(\text{Female})_{ij} + \gamma_{15}(\text{Educ/Occ})_j(\text{Female})_{ij} + \gamma_{20}(\text{Paratt})_{ij} + \gamma_{30}(\text{Parmon})_{ij} + \gamma_{40}(\text{Schcom})_{ij} + \gamma_{50}(\text{Guilt})_{ij} + \gamma_{60}(\text{Peerdel})_{ij} + \gamma_{70}(\text{T1delq})_{ij} + \mu_{0j}$.

If the neighborhood variables exhibit significant effects on the slope coefficient for sex, cross-level interactions are present, and the effects of neighborhood context on delinquency are moderated by sex or, conversely, the effect of sex on delinquency is moderated by neighborhood context. Results for this model are found in Table 5.11.

Table 5.11. Full Model Including Cross-Level Interactions between Sex and Neighborhood Variables

	Coefficients	Se	
Intercept, γ_{00}	0.38	2.79	
Fixed Effects			
Individual-level			
Parental attachment, γ_{10}	0.16*	0.08	
Parental monitoring, γ_{20}	0.05	0.11	
School commitment, γ_{30}	-0.10	0.14	
Guilt, γ_{40}	-0.35*	0.17	
Delinquent peers, γ_{50}	1.47*	0.08	
Time 1 delq (residual), γ_{60}	0.01	0.01	
Neighborhood-level			
Grp$\bar{x}$ Female, γ_{01}	-2.14*	0.78	
Grp$\bar{x}$ Paratt, γ_{02}	-0.09	0.35	
Grp$\bar{x}$ Parmon, γ_{03}	-0.76	0.58	
Grp$\bar{x}$ Schcom, γ_{04}	0.69	0.58	
Grp$\bar{x}$ Guilt, γ_{05}	-0.54	0.93	
Grp$\bar{x}$ Peerdel, γ_{06}	0.92	0.49	
Grp$\bar{x}$ T1delq, γ_{07}	-0.02	0.06	
Mobility, γ_{08}	3.00*	1.52	
Unit density, γ_{09}	-0.77	1.31	
Overcrowding, γ_{010}	-30.56*	12.73	
Concentrated disadvantage, γ_{011}	0.01	0.06	
Education/occupation, γ_{012}	-0.08	0.10	
Sex Slope (β_1)			
Intercept γ_{10}	-1.75*	0.28	
Mobility, γ_{11}	6.66*	2.47	
Unit density, γ_{12}	-4.41*	2.07	
Overcrowding, γ_{13}	3.93	20.95	
Concentrated disadvantage, γ_{14}	-0.06	0.08	
Education/occupation, γ_{15}	-0.16	0.17	
Random Effects	**Variance Components**	**df**	χ^2
Between, τ_{00}	0.70*	147	365.84
Within, σ^2	6.26		

*$p \leq .05$

As shown in Table 5.11, two neighborhood variables significantly interact with sex (see the results for predicting the sex slope, β_1): Mobility and Unit Density. The coefficient for mobility is positive, indicating that as neighborhood mobility increases, delinquency increases, but this variable has a greater positive effect on girls' than on boys' delinquency (recall that sex is coded 1 for female). The higher the neighborhood mobility rate, the greater the rate of increase in the frequency of girls' delinquency compared to boys in the same neighborhood. Although boys have higher rates of delinquency than do girls at all levels of neighborhood mobility, this difference (or "sex gap" in delinquency) decreases as mobility increases due to more rapid increases in girls' offending.

For unit density, the coefficient is negative; higher levels of unit density are associated with lower levels of delinquency for both sexes, but this suppression effect is stronger for females than for males. Thus, although mobility and unit density both produce increases or decreases in delinquency frequency for girls and boys, the effects of these variables are greater for females than males in the same neighborhoods.

As in previous models, overcrowding is negatively related to delinquency, and mobility now exhibits a significant, positive direct effect. As expected, greater rates of neighborhood mobility mean higher frequency of serious offending.

Of the Level-1 variables, level of perceived guilt and association with delinquent peers are again significant predictors of delinquency. In addition, level of attachment to parents now exhibits a significant effect, although in an unexpected direction: the greater the attachment, the greater the frequency of serious offending. Levels of parental

monitoring and school commitment again are not significantly related to serious offending.

As with previous hypotheses, Hypothesis Four is supported only in part: only two of the five neighborhood variables interacted significantly with sex, but the fact that cross-level interactions were found lends some credence to the possibility of differential contextual effects for girls and boys. Next, the hypothesized interactions between sex and the individual-level variables are tested.

Hypothesis 5: Each individual theoretical predictor will interact significantly with sex. That is, the effects of each of the variables will differ by sex.

To test this hypothesis, the equations used to test Hypothesis 4 were expanded in that interaction terms between each of the Level-1 theoretical variables (parental monitoring, parental attachment, school commitment, guilt, and delinquent peer association) and sex were entered into the Level-1 equation. Interaction terms were created by group-mean centering the Level-1 variables and then multiplying them (Aiken and West, 1991:5).

None of the interaction terms had significant effects. Several additional analyses were conducted using reduced models. This process reversed the analyses described above: First, the Level-2 variables were omitted from the Level-2 equation for sex; and second, the Level-2 variables were omitted from the Level-2 equation for the intercept, leaving only the Level-1 model. In none of these models were the interaction terms between sex and the individual-level theoretical variables significant. It was thus

concluded that Hypothesis 5 was not supported: no evidence was found that parental, school, and peer factors operate differently for girls and boys.

SUMMARY

This chapter began with descriptive statistics for both the individuals and census tracts under analysis in the dissertation. Next, girls and boys were compared on demographic, attitudinal, and behavioral characteristics. Finally, the relationships hypothesized in the integrated theoretical model were tested using hierarchical linear modeling techniques. Chapter Six provides a summary of these findings, so these will not be repeated here, except to comment that, in general, the unexpected should have been expected.

CHAPTER SIX:

DISCUSSION AND CONCLUSION

The overarching goal of this dissertation was to test the utility of a cross-level integrated theoretical model for predicting serious delinquency, and to determine whether the theoretical model was invariant for girls and boys. The reasons for these inquiries were several: the debate over whether sex/gender-specific or sex/gender-neutral explanations are necessary, the relative dearth of prior tests that include sufficient numbers of females, few analyses of integrated theoretical models as explanations of both girls' and boys' delinquency, and limited knowledge of whether contextual effects have the same influence on both sexes' behaviors. To summarize, females have traditionally been overlooked in the development and testing of delinquency and crime theories. The question thus arises as to whether theories created to explain male delinquency and crime can explain females' offending. Some scholars argue that they cannot and should not be used; the thrust of this argument is that females have very different experiences than do males, and these experiences and their outcomes must be examined from a female-based perspective. Some scholars argue that traditional theories do have explanatory power for both sexes, and that sex-specific explanations are unwarranted. Still others believe that traditional theories can be used to explain females' offending, but they are not sufficient; the specific context of females' lives and behaviors must be examined to fully understand their offending.

Data from the National Evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program provide a unique opportunity to examine the utility of

traditional theories, including both macro- and micro-level theory, in explaining girls' and boys' delinquency. Few studies at the individual-level allow for the integration of census data for respondents' home addresses to examine both contextual and individual influences on behavior, so this study contributes to the relative paucity of knowledge in this area. Self-report data from middle-school students in six U.S. cities provided a geographic and ethnically diverse sample of individuals and census tracts. An integrated theoretical model, combining concepts from social disorganization, social control, and social learning theories, was tested using hierarchical linear modeling techniques that appropriately address the nested nature of the data. Although it was not possible to measure such contextual factors as oppression and discrimination that structure girls' lives, this study provides some insight into how neighborhood context influences girls and boys in similar and different ways.

LIMITATIONS

In spite of the unique research potential these data hold, they also have their limitations. Recall that this study uses a public school sample; despite the research team's efforts to contact each member of the sample, by repeat visits to schools and mailing questionnaires to respondents' homes, attrition between Times 1 and 2 poses limitations. Lack of data at either Time 1 or Time 2 results in possible overestimation of prosocial attitudes and underestimation of delinquency because the respondents who dropped out of the study are more likely to have been those at higher risk for delinquent involvement. Thus, the results reported in this dissertation represent a "conservative" estimate.

Less problematic was the problem of non-matches when coding addresses to census tracts and loss of respondents due to the inclusion of only those census tracts with two or more respondents. It is not possible to retain respondents with non-matched addresses, but future analyses can include students who reside in tracts with only one respondent. Preliminary analyses with this sample (i.e., all census tracts, not just those with two or more respondents) produced low reliabilities, although reliabilities were also low (.31 to .35) for the HLM analyses reported in the dissertation. Since reliabilities depend upon the variation of the true parameters across neighborhoods and precision in the estimation of each neighborhoods' regression equation, low reliabilities can result from lack of precision in estimating the intercept and slope coefficients (Bryk and Raudenbush, 1992:69). This lack of precision is tied to the sample size within each neighborhood for the intercept estimation and to both sample size and the variability within each neighborhood for the slope estimations. Despite the fact that over 150 tracts were used in these analyses, the number of persons within each tract was often low, which may have affected the reliability estimates.

The dissertation sample size may also be tied to other aspects of the research, including the cross-level interactions: It may be that there was not enough power to detect cross-level interactions (although the fact that two were found suggests adequate power). Hofmann, Griffin, and Gavin (2000:496) describe two studies that suggest a sample of thirty units with thirty individuals each in order to have sufficient power (.90) to detect cross-level interactions. This requirement is not met with the current sample. It is also the case, however, that the larger the number of units, the fewer the individuals

necessary within each of the units to achieve comparable power levels (Hofmann et al., 2000). The issue of sample size is one still under debate among multilevel researchers, and only further multilevel research can help set the parameters for acceptable sample sizes to answer specific research questions.

The fact that Omaha uses a bussing system to transport students, and students in some other sites choose, to attend schools outside of their neighborhoods begs the question of which environment should logically constitute these youths' "larger context." Students who attend schools away from their neighborhoods and who spend a majority of their time prior to and after school on and around school grounds may be influenced more by the school environment and neighborhood around the school than by the neighborhood surrounding their residences. By contrast, students who are bussed but who spend only in-school time in that neighborhood and the remainder of their before and after-school time in their own neighborhoods would likely be influenced more by their residential areas than by the school and its surrounding area. This presents a difficulty for the analyses conducted for this research, in that students' residential neighborhoods were examined; perhaps analysis of students' school neighborhoods would produce different results in Omaha, Lincoln, and other places in which students' residential neighborhoods are quite different from their schools' neighborhoods.

Another potential limitation of this study is the construction and use of the concentrated disadvantage measure. First, as explained previously, a composite measure prohibits the delineation of the importance of specific factors for understanding delinquency. Although it was not an objective in this dissertation to tease out the relative

importance of the five variables that comprised the disadvantage measure, I plan to make this task a focus of future research. Second, exploratory analyses indicated that when factor analyses of census variables were conducted by site, somewhat different factor structures were found. Differences were not great enough to discredit the results reported here, but may warrant further exploration.

With these limitations (and likely others I have neglected to include here) in mind, the following section provides a discussion of the study's findings. Also included are implications of these findings for theory, research, and policy, and recommendations for future research.

DISCUSSION

The sample used for the dissertation analyses was limited to students whose 1995 addresses were successfully assigned to census tracts, to those census tracts in which two or more respondents resided, and to those respondents for whom data were available at both Time 1 and Time 2. This latter criterion was related to the use of two waves of data, in order to provide correct temporal ordering of the variables and relationships under examination. Individual-level data were linked with census data to measure both individual and contextual effects on individual delinquency, something to date not commonly done in criminological research. The cross-level integrated theoretical model that provided the framework for the analyses included neighborhood-level variables, as well as individual-level variables representing the domains of family, school, and peers that were drawn from social bonding and social learning theories. The dependent variable of interest was a six-item delinquency index consisting of stealing items worth

more than $50, going or trying to go into a building to steal something, stealing a motor vehicle, attacking someone with a weapon, using a weapon or force to get money or things from people, and shooting at someone.

Characteristics of Respondents and Census Tracts

The young sample, averaging twelve years of age at Time 1, was almost equal in terms of girls and boys. One-third lived in single-parent families, and just over half (55%) was white, but the sample was racially and ethnically diverse. For example, 14 percent was African-American, and almost 20 percent was Hispanic. Although the census tracts as a whole were fairly representative of the nation, as demonstrated by comparing the census tract characteristic means with the national averages for the variables, variation in census tract characteristics was present both across and within the six sites analyzed in this study. Philadelphia contained the census tracts that were the most "disadvantaged," and Lincoln contained tracts that were least disadvantaged.

Attitude and Behavior Comparisons by Sex

Girls and boys were compared on a number of attitudinal and behavioral measures important to the study. Girls in the sample were more "prosocial" than were boys, reporting higher levels of school commitment and greater perceived guilt for potential delinquency, fewer friends who were delinquent, and lower prevalence and frequency of serious delinquency at Times 1 and 2. They also reported experiencing higher levels of parental monitoring than did boys. No significant differences were found between girls and boys for levels of parental attachment.

HLM Analyses of Hypothesized Relationships

Limited support was found in the hierarchical analyses for hypothesized relationships between contextual and individual factors and youths' serious offending and for the differential operation of the theoretical model for girls and boys. Nevertheless, interesting and important findings did emerge, and these will be highlighted in the discussion below. The frequency with which youths commit serious offenses did vary significantly across the neighborhoods in this sample (Hypothesis 1). This means that there were differences in youths' delinquency that were potentially explainable by contextual factors. It was also possible that individual-level factors could account for all of this variation, but this possibility was not borne out.

In examining the effects of only the Level-1 variables on delinquency, it was true that being female and having higher levels of school commitment were significantly related to lower frequencies of delinquency and that association with greater numbers of delinquent peers was associated with greater delinquency frequency (Hypothesis 2A). I did not find, however, that parental attachment, parental monitoring or guilt were significantly related to serious offending when examining only the individual-level model.[11] Perhaps by this age, peers have supplanted parents as the most important influences on these youths' behaviors. Another possibility is that there is a temporal causal ordering of these variables (as proposed in Figure 2.2) that is not captured by including all variables at the same time in the analyses. Parenting factors, for example,

[11] Suspecting that delinquent peer association may be absorbing some predictive power of the other variables, I also ran the model omitting this variable. The results remained the same, except for one variable: significant effects were found for sex, school commitment, and now guilt, whose coefficient was

may precede and influence youths' levels of association with peers who are delinquent, exhibiting an indirect effect on delinquency that cannot be teased out in the present analyses.

Of the four individual-level theoretical variables, only parental monitoring and school commitment varied significantly across the census tracts under analysis (Hypothesis 3A). I did not expect parental attachment to vary by neighborhood, and this expectation was confirmed. Guilt and delinquent peer associations, however, were also expected to show significant variation, but this was not the case: levels of guilt and the number of delinquent peers with whom youths associated did not vary across the census tracts. Apparently, neighborhood context (at least as measured here) is not associated with how much guilt youths feel for potential delinquency or with the number of youths' friends who are delinquent. Nonetheless, analyses were conducted to assess whether contextual variables could explain the neighborhood variation in parental monitoring and school commitment.

Contrary to my expectations, none of the neighborhood variables could explain variations in levels of parental monitoring, but concentrated disadvantage did have an effect on youths' levels of school commitment. The lack of relationship to parental monitoring may be due to the operationalization of this measure; the questions tap more into monitoring as communication than as direct supervision of behavior. Because of this, single and working parents have just as much ability to "monitor" their children (e.g., knowing where and with whom their children are) as those parents who are able to

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negative as expected. Parental attachment and monitoring, however, remained unimportant in predicting

provide direct supervision. Since the greatest differences in *direct* supervision of behavior would be found between neighborhoods with the highest and lowest percentages of single and working parents, this measure may not truly capture "monitoring" as it is defined in this dissertation.

The relationship between concentrated disadvantage and school commitment was positive; the greater the neighborhood disadvantage, the higher the level of school commitment of respondents. Several promising explanations for this unanticipated finding come to mind. First, it is possible that, rather than viewing school as a dead end, as suggested by Figueira-McDonough's (1993) research, youths in disadvantaged neighborhoods see education as the only way to improve their situations. Adherence to this view then motivates a commitment to school and to the institution of education that is not as strong in more advantaged communities.

Second, the connection between disadvantage and race may be a factor, in that past studies reveal higher levels of school commitment, educational expectations, and/or aspirations among African-American than white youths. Although not specifically tailored to level of school commitment, educational aspirations and expectations research shows African-Americans held higher educational aspirations than whites (Wilson and Wilson, 1992), and greater expectations about their future academic success than youths from other racial or ethnic backgrounds (Tashakkori and Thompson, 1991).

The relationship between school commitment and delinquency may have been muddled in this study due to the fact that the joint effects of race and sex were not taken

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delinquency.

into account. Some have argued, for example, that it is not possible to compare the experiences of African-American females to white females, so studies such as this one that compare females to males, whose samples include females and males of different racial or ethnic backgrounds may yield different results than more homogeneous samples. Indeed, educational research comparing African-Americans and whites indicates that expectations were similar by race, but a gender effect emerged: the percentages of African-American females and white males who had goals of going to college were slightly higher than their race/sex counterparts (Allen, 1980). Similarly, Richman, Clark, and Brown (1985) found that white females and African-American males were less confident in their school ability than were African-American females and white males.

Socioeconomic status is obviously a factor to be considered as well; one study using the 1980 High School and Beyond data found that although higher income was associated with greater educational aspirations, when African-American and white females were compared, African-Americans held higher aspirations than did whites (Karraker, 1992). Likewise, Solorzano (1992), analyzing 1988 data from the National Educational Longitudinal Survey, found that as SES increased, so too did educational aspirations for the whole sample, but when SES was controlled, African-American students had higher aspirations than white students. Given these collective research findings, it is not surprising that the measure of disadvantage was positively related to school commitment.

A final possibility regarding this finding, however, must be noted. A sample selection bias could be responsible for the relationship between disadvantage and school

commitment. That is, in disadvantaged neighborhoods, it may be that only those youths who are highly committed to school actually attend school; because this is a school-based sample, then, this positive relationship between disadvantage and school commitment appears in the data.

Although I hypothesized that each neighborhood factor would have a significant main, as well as direct, effect on delinquency (Hypotheses 3C and 3D), this was also not the case. Indirect effects of neighborhood context through the individual-level theoretical factors were also not found (although disadvantage had a significant effect on school commitment, school commitment was not related to delinquency when all Level-1 and Level-2 variables were included in the model).

Of the five contextual variables (mobility, unit density, overcrowding, concentrated disadvantage, and education/occupation), only overcrowding had both main and direct effects. In the full model including the cross-level interactions, mobility also had a significant effect that did not appear in other models (see the discussion of Hypothesis 4 below).

Overcrowding, defined as the percentage of housing units in a neighborhood with more than 1.5 persons per room, had a negative effect on delinquency that was opposite of the hypothesized effect and contrary to some prior research (e.g., Roncek, 1975:857; 1981:88). It is also the case in prior research that overcrowding, when examined along with other neighborhood residential characteristics such as unit density and population density, has been either unimportant (Roncek and Maier, 1991) or not as important (Levy and Herzog, 1974; Roncek, 1981) in predicting crime as other residential variables.

Given these findings, one would expect that of unit density and overcrowding, the former would have exhibited the significant effect rather than the latter. It is not known to what extent data, sample, and method differences account for the contrary findings in this study.

Despite the fact that research findings on overcrowding are conflicting, one possible explanation for the current study's finding merits note. Federal regulations restrict the number of persons allowed to reside in a public housing unit. Although, as Popkin and her colleagues' research (2000) shows, many residents violate this regulation, it is also reasonable to believe that they would not report to census-takers the actual number of persons residing within the unit. Although not all socially disorganized areas belong to public housing, public housing is comprised of some of the most disadvantaged individuals and families. To the extent that public housing units are not overcrowded as defined here (or at least officially so), the possibility exists that lower levels of crowding are associated with higher rates of delinquency.

A lack of finding of significant effects of mobility, concentrated disadvantage and education/occupation is curious. The lack of the hypothesized effect of mobility (in the models testing Hypotheses 3C and 3D) on serious delinquency may in part be explained by the increasing entrenchment of Wilson's (1987) "underclass" in disadvantaged communities. Taylor and Covington (1988), for example, found increasing rates of violence in low-mobility neighborhoods with high minority concentrations that were plagued by poverty. The effects of mobility or stability may depend upon the poverty or affluence of a neighborhood. Ross and her colleagues (2000) found that stability was

associated with low psychological distress in affluent neighborhoods, but it did not reduce the stresses of disorder in poor neighborhoods. Similarly, Smith and Jarjoura (1988) found that mobility was positively related to violence in poor, but not affluent, neighborhoods. Thus, as with the effects of SES (see Wright et al., 1999), the effects of residential in/stability may cancel each other out in research with samples containing both poor and affluent neighborhoods. To examine this possibility with these data, I included a poverty-mobility interaction term in earlier analyses. This term was not significant, however, and was excluded from the analyses reported here.

Although prior contextual and multilevel analyses generally supported the relationship between concentrated disadvantage and individual delinquency (Elliott et al., 1996; Gottfredson et al., 1991), the fact that in this study few neighborhood factors influenced individual delinquency perhaps should not have been unanticipated. Cattarello (2000), using data from census tracts within one location, found that social disorganization, but not mobility, had main effects on lifetime marijuana use and indirect effects through only one mediating variable (friends' use of marijuana). Although social bond elements exhibited variation across neighborhoods, neighborhood factors were not found to be related to youths' family attachments, levels of school commitment, or beliefs about marijuana. Gottfredson and her colleagues (1991) examined the effects of contextual and individual factors on theft and vandalism, interpersonal aggression, and drug involvement. In contrast to Cattarello's findings, the results of their contextual analyses showed main and direct effects of disorganization on females' aggression; main and direct effects of neighborhood affluence and education on males' property crime; and

direct effects of disorganization on males' drug involvement. In the present study, both property and person offenses are combined in the index of serious offending; perhaps it is necessary to disaggregate these offenses in future research. Nonetheless, it is clear from these examples that research has not found consistent effects of neighborhood factors across sex or different types of delinquency.

Hypothesis 3D also predicted direct effects of individual-level variables. When neighborhood context was taken into account, the effects of the individual-level variables differed in part from those found in testing the individual-level model only: while higher levels of school commitment were associated with lower levels of delinquency in the individual-level model, once neighborhood factors were included, school commitment was not a significant predictor. Conversely, guilt, which was unimportant in the individual-level model, significantly affected delinquency when contextual variables were controlled.

Two neighborhood factors, mobility and unit density, significantly interacted with sex. Thus, Hypothesis 4, which suggested interactions between all five neighborhood variables and sex, was not fully supported. For mobility, the coefficient was positive, indicating that the greater the rate of neighborhood mobility, the greater the upward change in females' serious offending compared to males in the same neighborhood. Figueira-McDonough (1992) developed a heuristic model to explore the utility of community structural factors for understanding females' crime that can provide some insight into the dissertation findings. As background, a summary of her model and propositions is presented here.

Her model incorporates two population dimensions (poverty and mobility) and three organizational characteristics (informal organization, formal organization, and linkages). Proposing an inverse relationship between poverty and formal networks through lack of resources, and an inverse relationship between mobility and informal networks, Figueira-McDonough (1992) created a typology of four "community ideals." "Disorganized" communities are characterized by both high poverty and high mobility. In these communities, poverty limits the ability of formal organizations to exert control and mobility limits the ability of informal organizational control. Because social control, both formal and informal, is inadequate, disorganized communities will exhibit the highest rates of delinquency of the four community types. By contrast, "established" communities are characterized by low poverty and low mobility. Formal and informal organizations are strong and able to exercise social control; thus, delinquency is lowest in these communities.

"Parochial" communities are characterized by high poverty and low mobility. Thus, formal organizational controls are low, but informal control is exerted by strong primary groups. These areas are more likely to be guided by traditional gender role ideology in exerting control, and thus, the greatest sex differences in delinquency will be found in parochial communities. By contrast, "stepping-stone" communities are characterized by low poverty and high mobility rates. Formal organizations are strong, but informal organizations are weak due to the transiency of the population. Given that informal control is most effective at inhibiting delinquency, delinquency in these communities is high. Sex differences in delinquency, however, are lowest of the four

communities; the stepping-stone community's boundaries are permeable, and the influence of egalitarian gender role ideology is likely to be strongest. Combining these ideas, Figueira-McDonough derives three propositions:

"Proposition 1: Communities with more permeable boundaries will be more receptive to gender egalitarian ideology and exhibit greater gender similarity in delinquent behavior rates than communities with closed boundaries" (1992:13).

"Proposition 2: Communities with strong informal networks will tend to control the behavior of their members according to gender-traditional roles" (1992:14).

"Proposition 3: Communities with strong formal networks will tend to control the behavior of their members in a more gender-neutral way" (1992:15).

Figueira-McDonough intended her model to apply to crime rates, rather than individual crime, and she hypothesized an interaction between mobility and poverty that is not supported with these data, but her ideas may be applicable to the findings of this research. It is possible, for example, that in high mobility areas, "non-traditional" ideas about gender roles are routinely "imported" and, thus, more prevalent, allowing girls more freedom to deviate. Thus, while both girls' and boys' frequency of serious offending increases with increases in neighborhood mobility, the effects are greater for females than for males so that the sex gap in delinquency is smaller in high mobility areas than in low mobility areas.

Figueira-McDonough's (1992) propositions may also be useful in looking at the finding for unit density. The coefficient for unit density was negative, signifying that the higher the density of housing units in the neighborhood, the lower both girls' and boys'

delinquency, but the greater the rate of change in girls' than boys' offending. Possibly, in areas of high housing density, informal networks serve to control youths in ways congruent with traditional gender roles, thus decreasing females' delinquency to a greater extent than males' delinquency. Clearly, these relationships warrant further investigation.

No support was found for the hypothesis that the effect of each individual-level variable would depend on sex (Hypothesis 5). None of the interaction terms (between sex and parental monitoring, attachment, school commitment, guilt, and delinquency peer association) was statistically significant. It is possible, as Espiritu's (1998) research suggests, that a gender-neutral framework is appropriate given the young age of the sample (12-14). Replication with later waves may reveal differential effects of theoretical factors by sex, but at this age level, the individual-level model appears to be applicable to the understanding of both girls' and boys' delinquency. An equally likely possibility is that these theoretical factors do not have differential effects by sex, regardless of age. Others, including Hirschi (1969) and Gottfredson and Hirschi (1990), have asserted this argument. Figuiera-McDonough and Selo, for example, in their reconceptualization of the equal opportunity argument, propose that "given similar conventional opportunities, males and females will behavior in similar ways, both legitimately and illegitimately" (1980:343). They are careful to point out, however, that access and socialization are not static and that systematic sex differences do exist.

In sum, what do these findings have to say in answer to the two questions posed at the outset? First, was the integrated theoretical model useful in predicting delinquency in

general? For the most part, no. Three variables—sex, delinquent peer associations, and overcrowding—were consistently related to delinquency throughout the analyses. When examining only the individual-level variables, school commitment also negatively affected delinquency. When all individual- and neighborhood-level variables were examined, however, school commitment was not significantly related to delinquency, but guilt was. These findings do not offer much support for Hypotheses 1 through 3. Second, did the theoretical model operate in similar or different fashion for girls' and boys' delinquency? None of the individual-level variables interacted with sex, but mobility and overcrowding did. For those individual theoretical factors that significantly affected frequency of offending, the mechanisms increasing or inhibiting delinquency are the same for girls and boys. There is evidence, however, that context may be important in differentiating between the sexes.

In addition to the options presented throughout this discussion for the general lack of findings, there is another: Quite possibly, I have misspecified the model. I may not, for example, have included those neighborhood factors most important to understanding sex differences in delinquency, or I may not have included the correct factors intervening between neighborhood context and individual behavior. Some scholars have argued, for example, that community sex ratio is important in understanding community dynamics and behavior, particularly as they relate to gender (Figueira-McDonough, 1992; Guttentag and Secord, 1983; Messner and Sampson, 1991; Wilson, 1987). In addition, it would be useful to explore the independent effects of neighborhood rates of female-headed households (not just single-parent families, as male single-parents are often better

off financially and occupationally), as well as the effects of the percentage of the population that is separated or divorced. Research has shown separation/divorce to have more negative effects on child outcomes than growing up in families in which two parents were never present (e.g., Rebellon, 2002); this effect appears to be tied to race, in that African-Americans are more likely than whites to grow up in the latter rather than the former (see, e.g., Thomas, Farrell, and Barnes, 1996). Research suggests that these factors (at the individual level) may have differential sex effects; whether the macro-level correlates of these variables significantly influence individual behavior should be explored.

At the individual level, it would be worthwhile to investigate the effects of such additional social learning and social control factors as youths' use of neutralizations, their commitment to prosocial and delinquent peers, and their involvement in conventional activities. Further, the effects of individual respondents' race/ethnicity, family structure, and family SES are important to control when macro-level correlates are included (Byrne and Sampson, 1986:12; Kornhauser, 1978:104).

POLICY AND PROGRAMMING IMPLICATIONS

Even at this young age, a sizable proportion of both girls and boys are involved in serious offending. By eighth-grade, 18 percent of the sample (11 percent of girls and 25 percent of boys) had engaged in at least one of the six serious offenses (stealing items worth more than $50, burglary, auto theft, attacking someone with a weapon, robbery, and shooting at someone) during the past six months. Considering that this is a conservative estimate (in that those omitted from this sample due to active consent

procedures and to attrition represented a more at-risk sample), these prevalence rates may seem troublesome, at the very least. It is important to remember, however, that without further investigation into what these offenses mean qualitatively, it is difficult to ascertain the actual seriousness of behavior that these statistics represent. In addition, it is impossible to know the circumstances under which these offenses occurred; some violent offenses, for example, may have been in self-defense or in retaliation for victimization. These circumstances often surround girls' violent behaviors (Acoca, 1999; Chesney-Lind and Shelden, 1998).

The fact that concentrated disadvantage (a composite measure of neighborhood proportions of poverty, unemployment, welfare receipt, African-American residents, and single-parent families) was positively associated with school commitment underscores the need to augment educational resources in economically and socially marginal areas. Despite the fact that school commitment was unrelated to delinquency once neighborhood context was controlled, concentrating monetary and community resources in under-staffed and under-funded schools can only increase positive outcomes for youths, particularly those for whom education is self-reported to be important.

In terms of its implications for gender-specific or gender-neutral theories and programs, this study's results support the latter more so than the former. At the individual-level, the effects of parental monitoring, parental attachment, level of school commitment, level of guilt, or associations with delinquent peers did not vary by sex. These results suggest that, when looking at these variables, the causes of girls' and boys' serious offending are the same and, therefore, similar responses to delinquency are

appropriate for both sexes. This is not to suggest, however, that different theoretical variables would have similar effects by sex and that there are no causal mechanisms that differ by sex; these are empirical questions that require further exploration.

There was evidence that the effects of some neighborhood variables are dependent upon sex: greater neighborhood mobility meant greater frequency of serious offending by both sexes, and higher unit density meant lower frequency of offending for both sexes, but in both instances, the effects of the neighborhood variables were stronger for girls than for boys. The policy implications of these findings are not clear, although it is suspected that intermediary factors can be manipulated to lessen the negative effects of high mobility and low unit density on delinquency; any result would benefit both sexes, but would appear to be more advantageous for girls than for boys. What these specific intermediary factors may be is left to future research that may include examination of neighborhood and individual notions of appropriate gender roles (to examine Figueira-McDonough's (1992) hypothesis that high rates of mobility are associated with more egalitarian ideas).

FUTURE RESEARCH

This dissertation answers some questions, but poses even more. In addition to the proposed projects and suggested research mentioned above, research to be undertaken by this author includes restricting the included census tracts to those with five or more respondents, in an effort to increase the reliability of coefficient estimation. Since few studies on contextual effects and girls' and boys' individual delinquency exist, it is important not only to replicate the analyses presented here, but also to investigate

additional dependent variables, including both prevalence and frequency of different types of delinquency and the prevalence of gang membership and gang-related behaviors.

I have mentioned at several points in this dissertation that examining the joint effects of race in addition to sex were beyond the scope of this study, but critical to undertake, as is research into the intersections between sex, race, and class (Collins, 1998; Simpson, 1991; Simpson and Elis, 1995; Wing, 1997). In conjunction with a colleague, I plan to assess the ability of the theoretical model to predict delinquency by race, while controlling for context, as Hawkins and his colleagues (1997) advocate. I wholeheartedly urge other researchers to do the same.

Another issue that was beyond the scope of this research was testing the pathways to delinquency suggested by the integrated theoretical model in Figure 2.2. These specific pathways can be analyzed using path analysis or, perhaps more appropriately, structural equation modeling techniques. In future research, I plan to use multiple-group structural equation modeling to determine whether these pathways to delinquency differ significantly for girls and boys.

Reciprocal effects were not assessed in this dissertation, but are important to examine for several reasons. First, Thornberry's (1987) interactional theory delineates such reciprocal relationships between variables I have measured at the individual level. Family bonds and school commitment, for example, can influence delinquency, but delinquency can also influence these bonds to society. Second, there may be feedback loops between macro- and micro-level processes that cannot be captured by examining a snapshot of data (e.g., Sampson and Lauritsen, 1994; Tienda, 1991). Neighborhood

factors may influence delinquency, but delinquency may also contribute to worsening neighborhood context, for example creating fear of crime that lessens interactions between neighbors that in turn perpetuates lack of informal control necessary to reduce delinquency.

As the discussion in this chapter has demonstrated, much remains to be done, fortunately for us researchers. This study supports both a gender-neutral (in terms of the individual-level variables) and, in part, a gender-specific (in terms of some of the neighborhood-level variables) approach, but it is clear that we must continue to explore similarities and differences in both contextual and individual influences on girls' and boys' behaviors. Above all, we must not forget the girls and women, while at the same time taking care in future research not to universalize their experiences.

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APPENDIX A

INDIVIDUAL-LEVEL SCALE ITEMS

Item	Item-Total Correlation
MATERNAL ATTACHMENT	
I can/can't talk to my mother or mother-figure about anything.	.64
My mother or mother-figure always/never trusts me.	.60
My mother or mother-figure knows/does not know all of my friends.	.44
My mother or mother-figure always/never understands me.	.71
I always/never ask my mother or mother-figure for advice.	.63
My mother or mother-figure always/never praises me when I do well.	.59
Scale Mean (SD): 31.87 (7.38)	
Cronbach's alpha: .83	
PATERNAL ATTACHMENT	
I can/can't talk to my father or father-figure about anything.	.71
My father or father-figure always/never trusts me.	.68
My father or father-figure knows/does not know all of my friends.	.51
My father or father-figure always/never understands me.	.76
I always/never ask my father or father-figure for advice.	.72
My father or father-figure always/never praises me when I do well.	.63
Scale Mean (SD): 29.44 (8.64)	
Cronbach's alpha: .87	
PARENTAL MONITORING	
When I go someplace, I leave a note for my parents or call them to tell them where I am.	.44
My parents know where I am when I am not at home or at school.	.58
I know how to get in touch with my parents if they are not at home.	.37
My parents know who I am with if I am not at home.	.57
Scale Mean (SD): 15.37 (3.06)	
Cronbach's alpha: .70	

SCHOOL COMMITMENT	
Homework is a waste of time. (RECODED)	.49
I try hard in school.	.57
Education is so important that it's worth it to put up with things about school that I don't like.	.42
In general, I like school.	.56
Grades are very important to me.	.56
I usually finish my homework.	.50
If you had to choose between studying to get a good grade on a test or going out with your friends, which would you do?	.56

Scale Mean (SD): 26.95 (4.98)
Cronbach's alpha:.79

GUILT
"How guilty or how badly would you feel if you..."

Skipped school without an excuse?	.59
Lied, disobeyed, or talked back to adults such as parents, teachers, or others?	.51
Purposely damaged or destroyed property that did not belong to you?	.67
Stole something worth less than $50?	.67
Stole something worth more than $50?	.74
Went into or tried to go into a building to steal something?	.72
Stole or tried to steal a motor vehicle?	.73
Hit someone with the idea of hurting them?	.62
Attacked someone with a weapon?	.69
Used a weapon or force to get money or things from people?	.70
Sold marijuana?	.80
Sold other illegal drugs such as heroin, cocaine, crack, or LSD?	.79
Used tobacco products?	.72
Used alcohol?	.72
Used marijuana?	.78
Used other illegal drugs such as heroin, cocaine, crack, or LSD?	.74

Scale Mean (SD): 41.88 (7.41)
Cronbach's alpha: .94

DELINQUENT PEER ASSOCIATION

"During the past year, how many of your current friends have done the following?"

Skipped school without an excuse?	.65
Lied, disobeyed, or talked back to adults such as parents, teachers, or others?	.61
Purposely damaged or destroyed property that did not belong to you?	.74
Stole something worth less than $50?	.75
Stole something worth more than $50?	.76
Went into or tried to go into a building to steal something?	.73
Stole or tried to steal a motor vehicle?	.66
Hit someone with the idea of hurting them?	.61
Attacked someone with a weapon?	.67
Used a weapon or force to get money or things from people?	.62
Sold marijuana?	.77
Sold other illegal drugs such as heroin, cocaine, crack, or LSD?	.70
Used tobacco products?	.69
Used alcohol?	.75
Used marijuana?	.77
Used other illegal drugs such as heroin, cocaine, crack, or LSD?	.65

Scale Mean (SD): 26.74 (11.32)
Cronbach's alpha: .94

SERIOUS OFFENDING*

How many times in the past 6 months have you...
Stolen or tried to steal something worth more than $50?
Gone into or tried to go into a building to steal something?
Stolen or tried to steal a motor vehicle?
Attacked someone with a weapon?
Used a weapon or force to get money or things from people?
Shot at someone because you were told to by someone else?

Time 1 Scale Mean (SD): 0.79 (5.93)
Time 2 Scale Mean (SD): 1.53 (7.71)

*Reliability statistics are not reported for serious offending. It is not assumed that if a respondent has engaged in one of these behaviors that this gives reason to believe he or she is involved in another or more of these behaviors (Huizinga, 1991:56).

APPENDIX B

CENSUS TABLES AND VARIABLES

Table #	Table Name	Universe
P005	Households	Households
P008	Race	Persons
P016	Persons in Household	Households
P019	Household Type & Presence & Age of Children	Households
P043	Residence in 1985	Persons 5 years & over
P060	Educational Attainment	Persons 18 years & over
P070	Sex by Employment Status	Persons 16 years & over
P078	Occupation	Employed persons 16 years & over
P095	Public Assistance Income in 1989	Households
P117	Poverty Status in 1989 by Age	Persons
H004	Occupancy Status	Housing units
H020	Units in Structure	Housing units
H069	Tenure by Plumbing Facilities by Persons per Room	Occupied housing units

Source: Census of Population and Housing, 1990: Summary Tape File 3-A.

APPENDIX C

ZERO-ORDER CORRELATION MATRICES

Appendix Table C1. Zero-Order Correlation Matrix: Individual-Level Variables

	Female	Paratt	Parmon	Schcom	Guilt	PeerDel	T1Delq	T2Delq
Female	1.00							
Paratt	-.02	1.00						
Parmon	.19**	.36**	1.00					
Schcom	.16**	.38**	.37**	1.00				
Guilt	.16**	.32**	.30**	.52**	1.00			
PeerDel	-.16	-.23**	-.21**	-.38**	-.42**	1.00		
T1 Delq	-.14**	-.15**	-.15**	-.24**	-.37**	.33**	1.00	
T2 Delq	-.22**	-.11**	-.19**	-.22**	-.27**	.56**	.31**	1.00

**$p < .01$

Appendix Table C2. Zero-Order Correlation Matrix: Neighborhood-Level Variables

	Pov	Unemp	Welf	Prf/Mgr	HiEd	Mob	Vacant	Ovrcrwd	UnitDens	Heterog	AA	SPF
Poverty	1.00											
Unempl	.80**	1.00										
Welfare	.88**	.76**	1.00									
Prof/Mgr	-.57**	-.56**	-.49**	1.00								
HigherEd	-.71**	-.70**	-.69**	.86**	1.00							
Mobility	.05*	-.003	-.15**	.09**	.29**	1.00						
Vacant	.65**	.63**	.49**	-.32**	-.44**	.23**	1.00					
Overcrwd	.60**	.62**	.45**	-.39**	-.47**	.12**	.57**	1.00				
UnitDens	.04	-.05	-.10**	.08**	.17**	.46**	.33**	.14**	1.00			
Heterog	.56**	.46**	.41**	-.46**	-.49**	.16**	.46**	.43**	.14**	1.00		
Afrcn-Am	.63**	.62**	.76**	-.33**	-.51**	-.31**	.47**	.18**	-.11**	.25**	1.00	
Single-par	.88**	.74**	.84**	-.55**	-.66**	-.02	.62**	.41**	.09**	.52**	.78**	1.00

**$p < .01$