The Pennsylvania State University

The Graduate School

College of the Liberal Arts

AN OPPORTUNITY MODEL OF JUVENILE DELINQUENCY

A Thesis in

Crime, Law, and Justice

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

December 2003

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ABSTRACT

This dissertation examines the role of opportunity as a factor contributing to juvenile delinquency. As conceived in this dissertation, youth may be provided a number of opportunities for delinquency not only through personal individual or contextual characteristics, but potentially also through the social contexts of their peers.

The school context is the social context used because of the role of the school as a central organizing force in the lives of youth. Schools, among other things, pull together same-aged youth, release them at the same time of day, and allow many youth to see friends. This connects to research that finds that delinquency is often a group event, with other youth serving as useful co-offenders. These ideas point towards the potential role of schools as an important social context. In this dissertation, no one youth can be viewed as totally independent of the other youth who also share the school context, even though any two youth may never be particularly good friends.

The contextual characteristics examined in this dissertation fall broadly in the categories of physical characteristics of the residential neighborhoods of the students, the "social disorganization" of the student population, family characteristics and, other contextual opportunity factors. The individual opportunity characteristics examined are broadly categorized as two characteristics of the family and three other individual-level opportunity factors. These three opportunity factors are unstructured time use, access to disposable income, and access to private transportation, the last two of which have not been empirically examined in past research.

The data come from The National Longitudinal Study of Adolescent Health, and the HLM statistical software package was used because of the multilevel structure of the data. In addition to examining total effects, a series of interactions were tested to determine 1) whether physical characteristics of residential neighborhoods were more important when particular family factors were in play, and 2) whether the amount of time adolescents spend in unstructured time use was more important in combination with other individual opportunity factors. A final set of analyses determined whether time use mediated the effect of family characteristics.

There were a number of interesting and significant findings. First, all three additional individual-level opportunity factors were significant predictors of several forms of juvenile delinquency. This supports the idea that adolescents' direct opportunity for delinquency, in terms of their daily lifestyles, is an important consideration for delinquency research. Second, there was a significant school contextual effect of unstructured time use on most forms of delinquency. This underscores the importance of the school context and the potential effect of the daily patterns of other youth in examining delinquency. Third, the contextual opportunity factors were valuable for explaining the schools' mean levels of the four forms of delinquency used in the analyses (property and person delinquency, heavy alcohol use, and marijuana use). In addition to the total effects, there was some support for broad categories of interactions, such as those between contextual unstructured time use and land use characteristics, and contextual family structure and land use characteristics for some forms of delinquency (but not others). There was also support for two interactions arguably implicit in social disorganization theory, specifically those of poverty by residential mobility, and poverty by racial and ethnic heterogeneity, on property

delinquency. Other interactions for which there was some support were between individual-level unstructured time use and land use characteristics, but only for property crime. Finally, there was modest support for the mediating role of individual-level time use mediating the relationship between the family characteristics and delinquency.

Overall, the results indicate that the opportunity framework and school context are especially useful for explaining several forms of juvenile delinquency. Additionally, future research should examine the role of disposable income and private transportation for juvenile delinquency, in addition to both the individual and school-level effect of unstructured time use. Finally, the broad idea in this dissertation is that youth attending the same school potentially have access to the opportunities of other youth in the school, thereby providing themselves with increased opportunities. Future research should determine whether this focus should be restricted to specific peer networks and peer contexts, or whether the larger school context is more appropriate.

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Acknowledgments

This research uses data from Add Health, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant P01-HD31921 from the National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123 W. Franklin Street, Chapel Hill, NC 27516-2524 (www.cpc.unc.edu/addhealth/contract.html).

I would also like to thank Eric Silver, Barry Lee, Rich Felson, Lisa Miller, and especially Wayne Osgood for their time and valuable comments that improved my work. Any errors are of course my own.

Chapter 1: Theoretical Connections and Hypotheses

Criminological theories recognize that a variety of characteristics of the social environment and of individuals differentially expose people to opportunities for crime and delinquency. Although we know a fair amount about the characteristics that increase the probability of juvenile delinquency by increasing individual and environmental opportunities for such an event, we know little about how individual and environmental opportunities act in combination. This dissertation examines theories of opportunity and control and extracts a variety of characteristics grounded in opportunity processes in order to examine ways that opportunity affects delinquency. Further, the approach is consistent with the criminal event perspective, viewing delinquency as a social event with multiple sources. Accordingly, individual and aggregate opportunity factors are used along with multilevel techniques to depict the multi-faceted role of opportunity in a delinquent event. This research extends previous research by explicitly modeling the complex ways that opportunity characteristics come together to affect the risk for delinquency.

The criminal event perspective, the general organizing framework for this dissertation, captures the complexity of crime and delinquency (Kennedy and Sacco 1996; Meier, Kennedy, and Sacco 2001b; Miethe and Meier 1994; Sacco and Kennedy 2002). This perspective views crime and delinquency as social occurrences and, as a result, multiple aspects of the event are considered (e.g., characteristics of social structure, the individual and victim). That is to say, there are additional relevant characteristics of a crime beyond individual motivation. For instance, youth with unstructured leisure time who decide to break into an abandoned building next door are not only motivated to do it, but also have the time. They live in an area that provides them with an abandoned building that tempts them and there is no one who stops them.

Without opportunity, which comes together in many forms to increase the probability of delinquency, there would be no crime. The possibility of delinquency, or a criminal event, is affected by patterns of behavior, such as the places that individuals go and how they spend time. Additionally, people move in and out of social contexts, most notably the contexts of family, work or school, and leisure (e.g., Meier, Kennedy, and Sacco 2001a; Silbereisen and Todt 1994). Each of these contexts provides greater or fewer opportunities for crime and delinquency, affecting the likelihood of a criminal event.

The criminal event perspective is particularly useful because it allows for the integration of a variety of characteristics from multiple theoretical frameworks that all have relevant contributions to our understanding of crime and delinquency (Meier, Kennedy, and Sacco 2001b; Sacco and Kennedy 2002). The purpose of this perspective, according to Meier, Kennedy, and Sacco, "is to identify those conditions – immediate and relatively close to the act – as well as other, more removed but still relevant factors, that are implicated in the occurrence of the crime" (2001a: 3). That is to say, there are proximal factors, such as the abandoned building and unstructured time use, and distal factors, such as mixed-use land patterns and poverty that are associated with the commission of an offense. Crime is a social occurrence, and what is unique about this perspective is the focus on the whole package of a criminal event as can be pieced together from various criminological theories. For example, there are theories of place, theories of victimization, and theories of individual offending that have pointed to some unique and yet some similar characteristics linked to a criminal event. The criminal event perspective simply recognizes that many theories of crime and delinquency have identified a number of relevant characteristics linked to crime and delinquency, and merely pulls the relevant pieces together to describe and predict such an event.

This dissertation uses the idea of delinquency as a social, criminal event. In particular, I look for factors that increase the likelihood that such an event will take place by increasing the opportunities for such an event to occur. General forms of opportunity examined in this dissertation fall under the broad categories of physical characteristics of the environment, family characteristics and individual characteristics. These opportunity characteristics are examined in a number of ways, which are designated as the six goals for this dissertation and are briefly summarized below.

The first goal of this dissertation is to determine if the contextual opportunity factors affect delinquency and, if so, which factors in particular. The second goal is to determine whether the individual opportunity characteristics affect delinquency and, if so, which factors in particular. The third goal of this dissertation is to determine whether the contextual effects of family characteristics moderate the contextual effects of the physical environment. This is, statistically speaking, an interaction between characteristics of the social context and is implicitly and explicitly acknowledged by aggregate-level criminological theory. The fourth goal is to check for the possibility that the contextual characteristics of the physical environment condition the effects of individual-level family characteristics on delinquency. Statistically speaking, this is a cross-level interaction. The fifth goal is to determine whether the individual opportunity characteristics moderate the individual family characteristics, which is accomplished through individual-level interactions. Finally, the last goal of this dissertation is to determine whether individual opportunity factors mediate or provide a mechanism through which the family characteristics lead to offending. It could be that the characteristics of an adolescent are more proximal sources for delinquency than the background family characteristics of the adolescent (e.g., family disruption).

Before moving on, I need to describe what I mean by "opportunity." For this dissertation, opportunity can be described as a set of circumstances that come together in space and time to produce a situation that is conducive towards delinquency. There are two ways that opportunity is examined. First, there is the opportunity that the adolescent perceives in a tempting target, a term borrowed from routine activity theory and discussed in the next section. A tempting target is anything that the potential offender can be delinquent to, and can be a person or property (e.g., a building, a television set, a fight with a peer). In the abandoned building example in the introduction, the presence of the empty building was the tempting target that, barring restraints against it, would be the target of the delinquent event. The "barring restraints against it" includes the second way that opportunity is examined, which is through social control or guardianship. There may be guardianship over the property or the offender (or both), and this dissertation is concerned with the second of these. Back to the adolescents in the earlier example, the next step would be to follow through on the perceived opportunity of the empty building. If there is an adult present, the opportunity presented by the building is likely insignificant. If there are five friends and an empty neighborhood, the opportunity for breaking into the building is increased. Thus, not only the presence of a tempting target but also the lack of social control increases an adolescents' exposure to situations conducive towards delinquency.[1]

This chapter reviews research about both contextual and individual effects on delinquency to establish the hypotheses presented at the end of each section. The chapter begins by examining previous contextual research in order to identify those factors that are associated with high rates of crime and delinquency. In particular, the role of opportunity and social control can be found in routine activity theory, social disorganization theory, and studies of place. This review of research on social context is followed by a review of individual opportunity factors

[1] Opportunity and social control are not mutually exclusive categories.

that increase an adolescent's risk for delinquency by moving them about in time or space in ways that place them away from guardianship and near targets. Thus, the first section covers contextual theory and the second section covers individual theory. The highlighted themes through both sections are the contribution of opportunity and control through environmental features, daily routines, and guardianship.

Contextual Theory – Opportunity and Social Control

This section reviews contextual research in order to identify those conditions that affect the general level of opportunities for delinquency in an area. In this dissertation, contextual or structural theories "propose that the proportion of crimes among groups, classes, communities, or societies differ because of variations in their social or cultural make-up… Such theories also consider the deviancy-producing structures that an individual must encounter in order to increase the probability of his or her committing a crime" (Akers 2000: 5). Accordingly, one focus of this dissertation is on determining what conditions or characteristics of social settings are conducive to or stifle delinquent behavior by affecting the general level of opportunities available for delinquency.

This section on contextual features that produce delinquency has two non-exclusive components: opportunity and informal social control. The contextual opportunity section reviews routine activity theory and a related field of research that falls broadly under the title of "place." Routine activity theory is the dominant structural opportunity theory. The contextual informal control section reviews social disorganization theory, the dominant neighborhood theory that centers on notions of social control. While there is some overlap between broad macro-level notions reviewed in this section, each line of research (routine activity, notions of place, social disorganization) is somewhat independent and offers unique insights into delinquency.

Social Context and Opportunity in the Current Research

Before proceeding with the contextual theory section, a note about the way social context is used in this dissertation is necessary. The school is the context of analysis, although 1) neighborhoods are generally the context of interest in criminological research, and 2) some of the "school contextual effects" reported later are based on school-level averages of the neighborhood characteristics of each student. These two points are inter-related.

On the first point, the dominant context for delinquency studies has been the neighborhood for about a century, though other contexts affect social behavior (e.g., Bronfenbrenner 1986; Silbereisen and Todt 1994). Neighborhoods are often used in contextual research for a number of connected reasons (but see, e.g., Felson, Liska, and South 1994; Welsh, Greene, and Jenkins 1999 for multilevel analyses with schools). First, delinquency is often a group event (Reiss 1986; Thrasher 1927; Zimring 1981). Indeed, the ability to control groups of neighborhood youth was of central importance to Shaw and McKay's research (1942) on social disorganization. The groups of youth who get into trouble, while sometimes consisting of friends, could also consist of co-offenders (Reiss 1986), or youth that are present when an opportunity for delinquency arises, whether or not they are a friend. The neighborhood is viewed as an important social context for delinquency research, as the thought is that neighborhood youth were most likely on hand when situations conducive towards delinquency transpired. For these same reasons, however, I use the school context while (and related to point two above) still taking aspects of the neighborhood environment itself into account.

From the perspective of youth, schools are an important organizing context for their daily lives. Specifically, there is evidence that schools are important contexts for making and seeing friends (Corsaro and Eder 1995). For example, Ennett and Bauman (1993) found in a cigarette

smoking study about peer groups that about 95% of students' friendship choices were with other students in their school (nominations were not limited to students within the same school). This connects to the delinquency and neighborhood research about delinquency happening in groups noted above. If co-offenders are important for delinquency, then the potential pool of youth that an adolescent has access to should matter. Furthermore, the constraints and opportunities of these co-offenders should matter. Schools in this dissertation serve as the dominant context in the lives of children from which youth can pull friends or even co-offenders, because of the schools central influence on children's lives. Context effects depend on contact, and the school in this dissertation is viewed as a better measure of potential contact.

As indicated in point number two above, I use neighborhood residential characteristics, but within the school context. The idea is that the environment of each youth still matters because the residential environments provide differential opportunities for delinquency. Because youth can pull friends and/or co-offenders from school rather than from their neighborhood, it increases the pool of potential youth available, and by extension, the pool of places to which an adolescent potentially has access. For example, if some land use characteristics provide more opportunities for delinquency (e.g., urban versus rural) then the structure of schools, unlike the neighborhood context, makes it at least possible that youth have access to environments beyond their own. In this way, no one youth can be viewed as totally independent of the other youth who also share the school context, even though any two youth may never be particularly good friends. Thus, each school used in the analyses that follow in a later chapter is seen as a summary of the social environments of each adolescent.

Contextual Opportunity – Routine Activity Theory & Notions of Place

Routine Activity Theory

Although routine activity theory is not inherently limited to aggregates or groups, most of the applications have been at the aggregate level. The macro-level focus means that aggregate or contextual characteristics are used to explain rates of crime and delinquency. In 1979, Cohen and Felson introduced routine activity theory to explain why beneficial gains across social indicators usually associated with lower crime rates did not curb crime. The authors pointed to changes in the opportunities for crime in the daily pattern of peoples lives (Cohen and Felson 1979). Indeed, the name "routine activity" is based on the theory's implication that daily life patterns and routines provide varying degrees of criminal opportunities.

Cohen and Felson specified three necessary elements of a crime: a suitable target, a motivated offender, and the absence of a capable guardian (1979). The basic idea is that a crime happens when a victim or target and a motivated offender come together in space and time when there is no guardian around to protect against the event. Specifically, the authors related changes in the "suitable target" and the "absence of a capable guardian" components to trends in crime rates. The "motivated offender" component is taken for granted, or is constant, which is one reason that applications of this theory have emphasized victimization. The assumption is that there are many potential offenders and there are other theories to explain motivation, so this aspect does need examined in routine activity theory research.

When it comes to testing routine activity theory, however, it becomes hard to quantify and measure. The two components (guardianship and suitable targets) are often indirectly measured, such as with time away from the home and the number of people in the house. These

types of measures are considered relevant because time away from the home should increase personal victimization and property victimization. This is because time out of the home increases inter-personal contact that could lead to violent victimization and decreases guardianship over the home, which could lead to property victimization. Although the ideas of exposure, proximity, guardianship, and target attractiveness were further developed to test routine activity theory (e.g., Cohen, Kluegel, and Land 1981), these concepts are still somewhat elusive and hard to quantify.

Those who have tackled the empirical issues of routine activity theory by constructing measures for the key components have mixed findings. For example, Cohen and Felson used a measure representing household activities and found a correlation between changes in activities and changes in violent and property victimization rates (Cohen and Felson 1979). Sampson and Wooldredge (1987) found some support for routine activity theory, but also found that demographic factors and a few structural factors had larger effects on victimization than many of the routine activity measures. Finally, Massey, Krohn, and Bonati (1989) found time away from the home was not a predictor of property victimization as expected, although the causal ordering is questionable because the data were cross-sectional.

For this dissertation, the important point made by Cohen and Felson is that even if the pool of potential targets and offenders were to remain constant, a change in the level of guardianship is enough to affect opportunities for crime and delinquency (Cohen and Felson 1979). Guardianship refers to the "capable guardian" component of the model, or the ability of someone to intervene or handle the situation. One of the authors' popular examples was the entrance of women into the workplace – although this entrance was a socially positive change, it may be related to increases in property crime through a reduction in guardianship over homes during the workday (Cohen and Felson 1979; Felson 1994). The decrease in guardianship over

property increased opportunities for delinquency because there was no one left in the home to watch over personal property.

Thus, one way to identify structural factors that may increase opportunities for crime and delinquency based on routine activity theory is to determine those factors that are associated with a decrease in guardianship. The next two sections address this point. The first section reviews the physical characteristics of place that reduce guardianship. The second section reviews social disorganization theory. One part of social disorganization theory focuses on informal social controls, a concept that links to guardianship and is further developed in the social disorganization section.

Characteristics of Place

One way that contextual opportunity presents itself in the crime and delinquency literature is in the form of characteristics of place, often the neighborhood. The study of place has a long history and the most relevant for this research has roots in an ecological approach to crime and delinquency (e.g., Burgess 1925; Hawley 1950; Park, Burgess, and McKenzie 1925; Thrasher 1927). The "kinds of places" explanations can include both routine activity and social disorganization theories discussed in this dissertation (Bursik and Grasmick 1993). One popular application of this type of explanation is the examination of "hot spots," or locations where crime events cluster together (e.g., Roncek and Bell 1981; Roncek and Maier 1991). Other explanations of place include characteristics of the physical environment itself, such as street design or lighting. The characteristics of place, as defined in this more physical way, affect opportunity through guardianship over people and property. It is not hard to imagine that the opportunity to victimize property or a person is increased when there is no lighting as opposed to a highly lit area.

One notable example is Stark's (1987) ecological theory of "deviant places" that extrapolated five characteristics from almost a century's worth of criminological research. Stark, in a review, found that poverty, transience, density, dilapidation, and mixed-land use consistently were related to high neighborhood crime rates (1987). Specifically, Stark (1987) presented a series of intertwined propositions that related each of the five factors (poverty, transience, density, dilapidation, and mixed-land use) to each other and outlined how they reflected social processes that affected the crime rate through opportunities for crime and delinquency. The themes that run through the relevant propositions are consistent with the opportunity focus of this dissertation – those of opportunity, informal social controls, and deviance.

The contextual factors Stark focused on related to either an increase in opportunities for delinquency or a decrease in the level of guardianship, increasing the aggregate level opportunities for delinquency. For example, Stark noted that density and poverty increased exposure to situations conducive to delinquency, exposure to mixed-land use, and reduced guardianship. Further, neighborhoods that were poor, dense, and had mixed-land use patterns also had high rates of mobility and dilapidation, which decreased the amount of guardianship over a neighborhood. All five factors are deemed important and relevant to this dissertation and are included in the analyses because of the aggregate effect of all five on opportunities for offending. Two of the characteristics, poverty and transience, were also identified by Shaw and McKay (discussed further in the social disorganization section). The three remaining factors Stark (1987) identified, however, are best described as physical characteristics of place. These factors, density, dilapidation, and mixed-land use, are discussed for the remainder of this section on "place."

The effect of density, according to Rodney Stark (1987), was partly in combination with poverty. In particular, it was in poor and dense neighborhoods that people tended to congregate outside, and these types of neighborhoods (poor, dense) tended to be near mixed-land use areas. The idea behind density was that it produced a situation where people did not want to remain in crowded buildings. That means that individuals, especially youth, are out of the home generally congregating on the streets. This put people in situations conducive towards delinquency; groups of youth congregating on the street in neighborhoods that tend to have low guardianship for a delinquent event.

The effect of dilapidation was also connected to the other characteristics for Stark. For those people in poor, dense, mixed-use neighborhoods, there is residential mobility (Stark 1987) because people want to move out of these areas as soon as possible. These conditions mean that the housing will become dilapidated. There is some level of community flux and rental units, where the end result is that people do not "properly" care for the homes. In this dissertation, dilapidation represents a concept close to that identified by Skogan (1990). In the context of this dissertation, dilapidation is viewed as a form of neighborhood decay, which is related to crime and delinquency by decreasing guardianship. This is done both by indirectly communicating to residents and others that nobody cares about the neighborhood, and directly by frightening away would-be neighborhood guardians (e.g., such as elderly neighborhood homeowners who fear neighborhood youth they do not know). Those youth attending schools where a number of students live in dilapidated housing should be at higher risk for delinquency because the opportunities for delinquency are increased.

Finally, mixed-land use affects crime places by providing locations conducive towards delinquency (Stark 1987). For example, in a discussion of street blocks and informal social

control, mixed-land use was implicated by Taylor (1997) as an important feature of every day life that affects crime and delinquency. Mixed-land use is, for instance, a block with both residential homes and commercial or industrial businesses. This mixing of homes with non-residential land use provides an area with a constant stream of strangers (Felson 1994; Taylor 1997). The steady flow of strangers promotes anonymity and reduces the level of supervision over neighborhood residents, particularly the youth.

There are two final points to make about Stark's (1987) article. First, the propositions suggest that the combinations of these structural characteristics increase delinquency risk beyond their separate effects. For example, he did not mention the effect of just being in a poor neighborhood or just being in a dense neighborhood, but the effect of being in a poor, dense neighborhood. This highlights the importance of examining how these structural characteristics interact to increase the opportunities for delinquency. Second, Stark recognized the importance of parental monitoring. Briefly, more time outside of the home decreased parental monitoring, increasing the risk for delinquency (Stark 1987). This point on parental monitoring will be discussed in the next section covering social disorganization.

Contextual Informal Social Control – Social Disorganization Theory

The last section reviewed routine activity theory and ideas of place, both macro-level perspectives grounded in opportunity processes. This section picks up on the point from routine activity theory that even if the pool of potential targets and offenders remained constant, changes in guardianship would affect crime and delinquency. This section reviews social disorganization theory, which intersects routine activity theory at the point of guardianship.

Social disorganization theory is the dominant approach to explaining differences between neighborhoods in rates of crime and delinquency (Bursik and Grasmick 1993; Sampson and

Groves 1989). The modern roots of social disorganization theory began about the 1920s with the publication of a few major works, including Park, Burgess, and McKenzie (1925), Thrasher (1927), Thomas and Znaniecki (1927/1958), and Shaw and McKay (1942). These Chicago School scholars witnessed incredible transformations in society during their time, such as the mass in-migration to urban centers (Burgess 1925; Shaw and McKay 1942; Thomas and Znaniecki 1927/1958). Several of these scholars were influenced by the research other scientists at the University of Chicago were conducting, particularly plant ecologists who examined how plants adapt to their environment. In fact, social disorganization theorists later used the notions of invasion, domination, and succession from plant ecology. Partially because of this exposure, researchers began to look at the interaction between people and the environment and viewed delinquency as an outcome of the environment, in this case, the urban city (Burgess 1925; Shaw and McKay 1942; Thrasher 1927). The ecological ideas were particularly useful in light of evidence that neighborhoods' delinquency rates remained fairly constant even when groups in those neighborhoods completely changed over time (Shaw and McKay 1942). This evidence indicated that neighborhood characteristics sustained the delinquency rates above and beyond the specific people that lived in the neighborhood, and social disorganization researchers set out to determine what structural or contextual characteristics were responsible.

Probably the most well-known early social disorganization researchers were Shaw and McKay, and most modern social disorganization research stems directly from their work (1942, 1969). They determined that rapid social growth and change broke down the informal social controls that were so important in minimizing delinquency rates in neighborhoods (Bursik and Grasmick 1993; Bursik 1988; Sampson and Groves 1989). Difficult social circumstances, such as rapid social change, hinder the natural ability of social controls to keep the delinquency rate

from increasing (Akers 2000; Bursik 1988). This emphasis on social control was one reason Kornhauser (1978) classified social disorganization theory as a group-level control theory. Formal controls are institutionalized means of control, such as the police and neighborhood connections to political powers outside of the neighborhood. This contrasts to informal social controls, which Akers describes as existing "in the family, friendship groups, churches, neighborhoods, and other groups in the community" (Akers 2000: 165). If you will feel bad if your mother finds out you have done something, you are subject to informal social control. These informal social controls are thought to be more useful than formal controls in reducing the level of crime and delinquency in a social setting.

Over the course of their research, Shaw and McKay identified three structural factors that affected delinquency rates by inhibiting the effectiveness of social controls: ethnic heterogeneity, residential mobility, and poverty (Shaw and McKay 1942). These factors relate to delinquency rates by reducing the amount of guardianship at the aggregate level over all youth in a neighborhood. Kornhauser noted "Each of these characteristics destroys or makes difficult the establishment of safe and orderly relations among the residents" (Kornhauser 1978: 59). Broadly speaking, these three factors make neighborhood connections unstable, which then hinders the neighborhood supervisory capability provided by informal social controls (Sampson and Groves 1989; Shaw and McKay 1942). These characteristics also increased social disorganization by increasing anonymity among residents, which decreased the level of informal social control over area youth. Specifically, residential mobility increased social disorganization because neighbors were not able to form and maintain friendship networks. Ethnic heterogeneity generated mistrust among neighbors, decreasing the likelihood that someone would intervene to control the behavior of strangers and their children. Poverty had indirect effects on delinquency because

poor people live in poor areas, which are more mobile and more diverse (Bursik and Grasmick 1993; Bursik 1988; Sampson and Groves 1989; Shaw and McKay 1942). In all three cases, anonymity between neighbors is a likely outcome, and this anonymity breaks down informal social control, which leads to delinquency.

Although poverty, residential mobility, and racial and ethnic heterogeneity are commonly used as predictors of crime and delinquency rates, the effects of these factors are not consistent across studies and are worth examining. Two reviews demonstrate this point: Sampson and Lauritsen (1994) and Smith and Jarjoura (1988). Both reviews suggest that the effect of residential mobility might be the most consistent of the three neighborhood characteristics linked to crime and delinquency rates. The effects of poverty are less clear. Smith and Jarjoura noted that the effect of poverty varied depending on the size of the area used in the study (1988). Sampson and Lauritsen (1994) noted that although the independent effect of poverty is questionable, the effect might be conditional on neighborhood change such as residential mobility, meaning it is more important in combination with another neighborhood factor (i.e., statistical interaction). This contention was supported by and Smith and Jarjoura's own empirical research (1988). Finally, both reviews indicate that few studies used an appropriate measure of ethnic and racial heterogeneity (Smith and Jarjoura 1988), but rather use the percentage of neighborhood residents who are African-American (Sampson and Lauritsen 1994). Smith and Jarjoura's own empirical research found the effect of racial and ethnic heterogeneity on violent crime rates was reduced to insignificance when family disruption was included in the model (Smith and Jarjoura 1988). Thus, the three neighborhood characteristics seem to be associated with crime and delinquency rates, because the exact nature of that relationship is still questionable.

In addition to poverty, ethnic and racial heterogeneity, and residential mobility, researchers also have argued that family disruption is consistent with social disorganization theory (see, Bursik and Grasmick 1993; Sampson 1986; Sampson 1992). The argument is that delinquency rates are affected by family disruption because parents are most often taking responsibility for their children, and more adults in the neighborhood should translate to a better functioning system of informal social control. For instance, Sampson argues, "in areas with a cohesive family structure, parents often take on responsibility for their own children and for other youth also…By supervising and keeping track of youth other than just their own, parents maintain some degree of control over group activity that accounts for well over one-half of all juvenile delinquency" (Sampson 1986: 278). This logic fits an opportunity perspective; a fewer number of parents in a neighborhood translates to a reduction in the amount of guardianship over youth and property.

There is empirical support for a contextual effect of family disruption. Anderson (2002), using the school context, found a positive significant effect of family structure on delinquency against persons after controlling for a number of individual and structural characteristics including the number of parents for the respondent. Interestingly, Anderson (2002) also found that the proportion of youth in single parent families (i.e., context effect) was negatively related to property crime. That is, as the proportion of single parent families within a school increased, the odds of an adolescent committing property crime decreased. Additionally, several macro-level tests of social disorganization theory have documented contextual effects of family disruption that were stronger than other more theoretically pertinent social disorganization variables (Sampson and Groves 1989; Veysey and Messner 1999).

A final factor, parental monitoring, also is consistent with the social disorganization perspective (also see Osgood and Anderson 2002). As just noted about family disruption, parents are the people most likely to take responsibility for their children. The general level of parental monitoring over all neighborhood youth should correlate with the delinquency rate of each neighborhood. For example, Riley (1985) "found that parental supervision of leisure-time activities was one of the most important predictors of juvenile delinquency" (cited in Sampson 1986: 279). Additionally, as noted in the last section on physical characteristics of place, Stark (1987) implicitly recognized the importance of parental monitoring. In particular, children experience lower levels of supervision when they spend more time outside of the home, in part because they move away from the people most likely to watch them, the parents (Sampson 1986; Stark 1987). I could not identify any research that examined the contextual or aggregate-level effect of parental monitoring. There is aggregate criminological research that examines characteristics similar to parental monitoring, such as collective efficacy. Thus, the aggregate effect of parental monitoring, although implicitly important in criminological writings for studying delinquency, is unknown.

In sum, social disorganization theory is a neighborhood control theory that explicates, among other things, the importance of neighborhood informal social controls. A low level of neighborhood informal social control is consistent with reduced guardianship, and both are associated with higher delinquency rates as compared with neighborhoods where there is more informal social control. Poverty, ethnic and racial heterogeneity, and residential mobility were identified as neighborhood factors that are associated with high rates of delinquency. Family disruption and parental monitoring were also identified as being related to delinquency rates by

reducing the level of informal social control over neighborhood youth. Consequently, all five factors are included in the analyses presented in a subsequent section.

Summary of Structural Opportunity Factors and Resulting Hypotheses

Eight contextual characteristics can be extrapolated from the macro-level perspectives (routine activity theory, characteristics of place, and social disorganization theory) as affecting rates of crime and delinquency by increasing opportunities for a criminal event. The contextual factors are poverty, ethnic and racial heterogeneity, mobility, single parent families, land use, dilapidation, density, and parental monitoring.[2] I have argued that all eight are opportunity factors in the sense that they affect delinquency by directly increasing opportunities for deviance or by decreasing informal social control, or guardianship. Informal controls are the social controls most likely to be present and to respond when a situation arises that could end in deviance, as adolescents are moving about in the daily routines of life. Routine activity theorists identified guardianship as an essential component of a criminal event.

The first four factors, poverty, residential mobility, racial and ethnic heterogeneity, and family disruption, primarily are associated with social disorganization theory, although they are consistent with routine activity theory and studies of place. In fact, Meier noted that these four characteristics "appear to be common among major theories of crime" (Meier 2001: 62). The next three factors, land use, dilapidation, and density, are identified most notably in the theories of place. These are three of the five factors identified by Stark's study of opportunity and place and all affect the chances of being delinquent by increasing the opportunities for a delinquent event to occur (Stark 1987). The final factor, parental monitoring, is relevant within social

[2] One other contextual characteristic, unstructured socializing with peers, is discussed in a later section.

disorganization perspective and is consistent with the notion of guardianship from routine activity theory.

Before discussing the hypotheses it is necessary to say a few words about the delinquency measures used in this dissertation. Specifically, three types of delinquency are used in the analyses: property crime, person crime, and substance use. These three forms of delinquency are distinguished because it is expected that the effect of the independent variables may differ among them. For example, Anderson (2002) found that the contextual effect of family disruption was different for property delinquency and person delinquency.

The first set of hypotheses examines the total effect between each of the opportunity structural characteristics and delinquency (denoted with a "c"). That is, do the opportunity contextual characteristics affect crime and delinquency? There are two reasons for beginning with this set of questions. First, there is mixed evidence for the effects of some of these characteristics as noted in the review above. Second, it is necessary to establish baseline effects for each of the context characteristics. The following list lays out the eight hypotheses for each of the structural characteristics discussed in this section and the anticipated effects based on previous research and theory.

Hypothesis 1c: Racial and ethnic heterogeneity will have a positive relationship with property delinquency, violent delinquency, and substance use, with more heterogeneity resulting in more delinquency.

Hypothesis 2c: Poverty will have a positive relationship with property delinquency, violent delinquency, and substance use, with more poverty resulting in more delinquency.

Hypothesis 3c: Residential mobility will have a positive relationship with all forms of delinquency included in the analyses, with higher residential turnover resulting in more delinquency.

Hypothesis 4c: Family disruption will have a positive relationship with property delinquency, person delinquency, and substance use, with more single parent families resulting in more delinquency.

Hypothesis 5c: Land use patterns will be associated with all forms of delinquency included in the analyses, with more delinquency expected as land use becomes more mixed. As residential areas are mixed with other uses, such as commercial use, higher rates of delinquency are expected.

Hypothesis 6c: Dilapidated housing will have a positive relationship with all forms of delinquency included in the analyses, with more dilapidated areas providing more opportunities for delinquency.

Hypothesis 7c: Density will have a positive relationship with all forms of delinquency included in the analyses, with more dense areas providing more opportunities for delinquency.

Hypothesis 8c: Parental monitoring will have a negative relationship with all forms of delinquency included in the analyses. Lower levels of monitoring should provide more opportunities for delinquency.

Interaction Among Structural Factors

The next goal of this dissertation is to test for interaction effects between the contextual characteristics. Although the effect of structural factors in combination with each other on crime and delinquency is both implicit and explicit in all three sections reviewed above, empirical examinations are sparse. Smith and Jarjoura (1988) presented arguments for conditional effects, or interactions, between residential mobility, poverty, and racial and ethnic heterogeneity as identified by Shaw and McKay (1942). Smith and Jarjoura expected that neighborhoods experiencing all three in combination should have significantly higher rates of crime and delinquency. The author's review of previous research examining these interactions indicated that poverty was important in conditioning the effects of mobility and heterogeneity (Smith and Jarjoura 1988: 34). That is, neighborhoods with lower socioeconomic status are more affected when there is also either high levels of residential mobility or high levels of racial and ethnic heterogeneity. Smith and Jarjoura's (1988) own research found a large interaction effect between poverty and mobility, and I will test for both of these conditional effects. I also expect

interactions between the physical characteristics of place, (e.g., dilapidation) and the family characteristics (family disruption and parental monitoring). That is, family factors that reduce guardianship in combination with land use characteristics that reduce guardianship will disproportionately increase the level of opportunities to be delinquent. The idea is that adolescents from areas with a low level of intact or high monitoring families may not be at as much risk when there is low density, little to no dilapidation, and residential (not mixed) land use.

Individual-Level Theory – Opportunity and Social Control

This section covers individual characteristics that increase the risk or probability of an adolescent being involved in a delinquent event by exposing them to some increased level or number of opportunities. In this dissertation, individual-level refers to research using characteristics of the person to explain why someone commits crime. This is in contrast to the macro-level focus of the last section, which used characteristics of social settings or groups to examine rates of crime and delinquency. In the criminal event framework, these individual characteristics are more proximal sources of crime and delinquency than the structural characteristics in the last section (see, Meier, Kennedy, and Sacco 2001a for discussion). In this dissertation, adolescent characteristics consistent with ideas of opportunity are used to explain participation in delinquency.

This section begins by outlining an individual version of the routine activity theory discussed in an earlier section. As opposed to the macro-level routine activity theory, the individual routine activity theory pertains directly to individual offending. With this link to offending, the individual routine activity discussion is further developed by a connecting two opportunity factors to the spirit of the theory. I then briefly return to the aggregate level with a

macro-level application of individual-level routine activity. Then the notion of social control as it relates to individuals (rather than the social setting) is outlined, followed by a summary and general set of hypotheses.

Individual Opportunity – Routine Activity Theory

Macro-level routine activity theory, reviewed in an earlier section, pointed to the convergence of a suitable target, a motivated offender, and the absence of a capable guardian as the necessary ingredients for a crime or delinquent event to occur. In 1996, Osgood and his colleagues extended the macro-level routine activity theory to explain individual-level offending rather than victimization like the macro-level theory version (Osgood, Wilson, O'Malley, Bachman, and Johnston 1996). First, they replaced the concept of a "motivated" offender with the situational idea that the motivation resides in the act itself (Briar and Piliavin 1965). If the motivation were solely in the person no other characteristic would matter for crime and delinquency. There are characteristics, however, of the situation that provides actors with motivation to offend, such as the pleasure of eating a pilfered candy bar or the satisfaction of hitting a rival in front of a crowd of onlookers. The suggestion is that everyone is prone to deviate based on the specific circumstance, where the characteristics of the situation itself makes a criminal event more or less likely. Second, the "suitable target" component of the macro-level routine activity perspective was replaced by the more general idea that some situations make a deviant act more possible and rewarding. Finally, the "capable guardian" component was discussed in terms more consistent with the use of "handler," which does not carry the connotation that a specific person is in charge. The concept of a handler has to do with control over the potential offender rather than being a guardian to the potential target of the crime (Felson 1986). This conceptualization also is consistent with the idea that the motivation for

crime and delinquency resides in the situation itself, and within the criminal event perspective, this promotes a more situationally inclusive examination of crime and delinquency.

The key concept of Osgood and his colleagues' individual-level routine activity approach was unstructured socializing with peers in the absence of authority figures (Osgood et al. 1996). The authors gave three reasons why the amount of time an adolescent spends in unstructured socializing increases his or her risk for delinquency. First, individuals who are involved in unstructured socializing have the opportunity to offend. This is because they are not in a structured activity that would occupy their time and attention, thereby restricting the opportunity to offend. Second, youth who spend more time in unstructured socializing are less likely to have a guardian or handler of a situation that may arise. Finally, there are peers available for companionship or co-offending, or to serve as an appreciate audience for deviant exploits, and generally, more exposure to situational inducements to delinquency (Osgood et al. 1996). Time spent in unstructured socializing increases the chances of a peer-centered environment. For example, recall that at the macro-level, parental supervision of leisure activities was an important factor affecting delinquency rates (Osgood and Anderson 2001; Sampson 1986).

The results of Osgood and colleagues (1996) individual-level study indicated that adolescents who spent more time in unstructured activities were at higher risk for criminal behavior, heavy alcohol use, use of marijuana and other drugs, and dangerous driving (Osgood, Anderson, and Shaffer Forthcoming; Osgood et al. 1996). Similarly, Flannery and colleagues found that youth who spent more time with peers after school were at higher risk for aggression and substance use than adolescents home with a parent or home alone (Flannery, Williams, and Vazsonyi 1999). Agnew and Petersen found that delinquency was positively related to time spent in unstructured activities and leisure activities with peers (Agnew and Petersen 1989). Thus,

there is evidence that adolescents who spend more time in unstructured socializing are at higher risk for several forms of delinquency.

Individual Opportunity – Extension of Logic

In addition to unstructured socializing with peers, there are two other adolescent characteristics included in this dissertation. I argue that both access to transportation and disposable income are consistent with routine activity theory both in terms of opportunity and guardianship. For instance, both factors have the capability of moving youth away from guardianship, placing them in setting where they are more anonymous to those around them. This anonymity increases exposure to situations conducive to deviance, increasing the risk of a delinquent event.

The first characteristic that fits the logic of routine activity theory is access to transportation. If adolescents are mobile, they have the ability to get away from the informal social control networks established by parents and other adults. Transportation gives an adolescent more freedom of movement and, as the adolescent moves into unfamiliar territory, they become unknown to those around them and they are less effectively supervised (Felson 1998). Once again, as anonymity is gained, informal control is lost, and that increases opportunity. There is support for this reasoning in studies of the effects of mass or rapid transit where findings indicate that large-scale transportation systems affect crime and delinquency. For example, youth use public transportation to get to areas where there are more targets, such as cars to break into (Brantingham, Brantingham, and Wong 1991; Felson 1998). This same logic applies to automobiles. Specifically, cars provide youth with a means for escaping their immediate environment by moving youth around in space, increasing the exposure to situations conducive to delinquency and affecting the risk for a delinquent event (Felson 1998).

Disposable income, the second and final individual opportunity factor in this section, is also likely to affect the opportunity for offending. Disposable income can be used to buy anonymity or otherwise grant the adolescent more freedom. For example, income could be used for transportation, such as to put gas in the car or to buy a bus or subway ticket "downtown." Adolescents' access to income can also make them less dependent on their family and more self-sufficient, providing the adolescent more freedom to be with friends. For instance, an adolescent would not need to be home to eat if they have the means to provide themselves with food (and no house rule about being home for dinner). An adolescent's disposable income also can be used to directly assist in deviant behavior, such as to purchase drugs, alcohol, or cigarettes. Research on youth employment provides indirect evidence of the positive relationship between working and delinquency (Ploeger 1997; Steinberg and Dornbusch 1991; Steinberg, Fegley, and Dornbusch 1993). Further, the strongest work-delinquency relationship is with substance and alcohol use (see, Ploeger 1997).[3]

A Macro-level Extension

When I reviewed the eight structural opportunity factors in a previous section, I made note that there was a ninth structural opportunity factor that would be discussed later. That last contextual opportunity factor is the aggregate effect of time use, or unstructured socializing with peers. In an unpublished paper, Osgood and Anderson (2002) extended the individual-level routine activity application of time use to the macro- or aggregate level. This macro-level idea of time use is different from the individual-level concept of time use. In particular, as just discussed, the individual-level concept of time use is interpreted as the effect of a specific youth's time use, or amount of unstructured socializing with peers, on that specific youth's

[3] Although the employment-delinquency relationship is different than the hypothesized access to disposable income-delinquency relationship, I could not identify any disposable income-delinquency research.

likelihood of delinquency. The macro-level concept of time use, on the other hand, refers to the effect on individuals of the average amount of time that all youth in the neighborhood spend hanging out, above and beyond any particular adolescents' time use patterns.

The contextual effect of time use on delinquency was expected from a routine activity perspective. First, there was an expectation that in settings where there was increased unstructured socializing with peers, it would be easy to encounter situations conducive towards delinquency. As noted previously in this dissertation, it is well-established that delinquency is often a group event (Sampson and Groves 1989; Zimring 1981). More youth hanging out with nothing in particular to do means that there are more kids to serve as co-offenders or victims or to provide drug or alcohol connections. Thus, although we expected that some of the effect was due to individual characteristics, a contextual effect of unstructured time use was expected to emerge (Osgood and Anderson 2002).

Furthermore, Osgood and Anderson (2002) noted that the expectation of a context effect of unstructured socializing with peers was also consistent with the social disorganization theory's emphasis on the role of peer groups as essential to social disorganization. In fact, some of the early social disorganization researchers used unsupervised peer groups in a neighborhood as an indicator of social disorganization (Sampson and Groves 1989; Shaw and McKay 1942; Thrasher 1927). The ability to monitor these groups is the key function of strong informal social control in social disorganization theory. Thus, both ecological perspectives would predict a contextual effect of unstructured socializing with peers in the absence of adults. Osgood and Anderson's (2002) research indicated that the school-level average of time adolescents spent hanging out with their friends, or unstructured socializing, was associated with school-averaged rates of

juvenile delinquency[4]. Moreover, the authors found that the largest independent contextual effect on unstructured socializing was through parental monitoring, which further supports the inclusion of macro-level parental monitoring in the current dissertation. Thus, the ninth contextual opportunity factor included in this dissertation is unstructured socializing with peers.

Individual Opportunity – Informal Social Control

Three opportunity factors, unstructured socializing with peers, access to private transportation, and access to disposable income, were outlined in the first part of the last section. I argued that all three characteristics fit the logic of an opportunity perspective, providing youth with increased exposure to situations conducive towards delinquency. As argued earlier in this chapter, there are also forms of social control that affect youths' opportunities for delinquency. This section reviews common uses of individual social control in theory to determine which characteristics are associated with more opportunity for delinquency.

The common use of the term "social control" at the individual-level within the criminological literature is not always consistent with the concept of social control as discussed in the macro-level section. At the aggregate level, informal controls provide guardianship over an entire area or group of people, affecting the general level of opportunities available for everyone. The same logic should be applied at the individual-level, but two senses of social control need to be differentiated. The first way social control is used at the individual-level has to do with social bonding theory. The second way that social control is used at the individual-level and which is most consistent with this dissertation concerns notions of guardianship.

Probably the most prominent use of the term "social control" is organized around Hirschi's theory of social bonding (Hirschi 1969). Hirschi identified four elements that kept

[2] This delinquency occurred anywhere and was not specific to school.

individuals from committing crime and delinquency by reducing the motivation for offending: commitment, involvement, belief, and attachment to others. These four elements of social bonding theory, however, are not consistent with the opportunity framework of this dissertation. The role of informal social control was reviewed in the macro-level section because this component of the social disorganization model was consistent with the "absence of a capable guardian" component of routine activity theory. The guardianship component of routine activity theory is consistent with the overall focus on opportunity characteristics that increase risk of delinquency by increasing situations conducive towards delinquency in this dissertation. The bonding elements are not consistent with these ideas because the degree of bonding is a source of inhibition.[5] Indeed, Gibbs notes, "Hirsch's theory does not encompass a conceptualization of control or social control, and one is left with the impression that either term designates *any condition* that inhibits juvenile delinquency" (Gibbs 1981: 146 italics in original). The amount of bonding does not directly relate to the opportunities available for delinquency. In particular, there is no increase in exposure to situations with elements of a delinquent event.

The second form of social control in criminological theory is consistent with the opportunity focus of this dissertation – a youth is exposed to some level of guardianship. This form of social control is more consistent with ideas from, for example, Reiss (1951) and his notion of external social controls or Reckless's (1957; 1956) notion of outer containments (Akers 2000). Both of these concepts point to control factors outside of the person (i.e., not

[5] The bond of involvement is similar to unstructured time use discussed earlier. The idea is that if youth are involved in activities or structured time use then there will not be time for delinquency. This is an assumption that I am not making. In particular, the opportunity for delinquency might present itself independently from structured activities as delinquency can happen very quickly. For example, athletes could quickly smoke marijuana during practice if the opportunity for doing so exists, namely the presence of marijuana and the absence of the coach or other adults watching them. Thus, the presence of a structured activity does not necessarily indicate the absence of opportunity. Unstructured time use is a better temporal measure of opportunity for delinquency, which is the theme of this dissertation.

psychological factors such as motivation or bonding) that work to keep people from committing an offense.

Consistent with these last notions of social control, two factors are identified as relevant for providing guardianship over youth: parental monitoring and family disruption. The number of adults in the home should provide some amount of guardianship over youth, and when there are fewer adults in the home there may be increased opportunities for delinquency (Felson 1994). There is substantial evidence that family disruption is an important predictor of delinquency. For example, Rankin and Kern (1994) found that adolescents in single parent families were at higher risk for delinquency even when they were attached to their parents. Similarly, Anderson (2002) found that adolescents in single parent families were at higher risk for person, property, and status delinquency independent of several other individual and contextual factors.

The second social control factor included in this dissertation is parental monitoring. It should be obvious that when parents provide a high level of monitoring over their children the children have fewer opportunities to be delinquent. There is considerable support for the effect of parental monitoring. For example, a review of family factors associated with delinquency found a lack of parental monitoring to be among family variables most predictive of delinquency (Loeber and Stouthamer-Loeber 1986). Similarly, Sampson and Laub (1994) found strong effects for maternal supervision on both official delinquency and parent, teacher, and self-reported delinquency. Additionally, the authors found that maternal supervision mediated the effect of the social context on delinquency, a finding that is tested in this dissertation (Sampson and Laub 1994).

Summary of Individual Opportunity Factors and Resulting Hypotheses

Three individual characteristics were derived from micro-level theories of opportunity and social control. The three factors are unstructured socializing with peers in the absence of adults, disposable income, and transportation. I have argued that all three factors increase situations conducive towards delinquency by decreasing guardianship or social control over an adolescent. In addition to the three micro-level characteristics, the macro-level effect of time use was discussed from a routine activity perspective. Aggregate time use is the last of the macro-level characteristics and the first hypothesis here follows those of the last section.

> Hypothesis 9c (macro-level proposition from micro-level section): It is expected that regardless of the amount of time that any one youth spends hanging out with friends not doing anything in particular, the average amount of time that all youth within that social setting spend in this manner increases the risk of delinquency for each youth in that social setting.

The remaining three hypotheses (denoted with an "i") fulfill the third proposed goal and examine the direct effect of each individual opportunity factor on delinquency. All of the direct effects are examined to establish baseline effects for further analyses and because there is little research that includes these characteristics.

> Hypothesis 1i: It is expected that adolescents with unstructured time use are at higher risk for property crime, person crime, and substance use.

> Hypothesis 2i: It is expected that adolescents with access to private transportation (i.e., automobiles) are at higher risk for property crime, person crime, and substance use.

> Hypothesis 3i: It is expected that higher amounts of disposable income will be positively related to property delinquency, person delinquency, and substance use.

> Hypothesis 4i: It is expected that adolescents in single parent families are at higher risk for property crime, person crime, and substance use.

> Hypothesis 5i: It is expected that adolescents with parents who are less available for monitoring are at higher risk for property crime, person crime, and substance use.

Interactions and Mediation – Structural and Individual Characteristics

The next step will be to determine whether there are conditional effects of opportunity factors. Two types of interactions will be examined. The first type of interaction is between an individual-level factor and a structural factor, or a cross-level interaction. Cross-level interactions in this dissertation mean that school-level characteristics differentially affect groups within an independent variable. The idea is that context only expresses itself when individual opportunity factors are in play because the combination may provide multiple opportunities for delinquency. For example, the effect of living in a single parent family may matter more, or only, when the area is very dense or very dilapidated, as the youth is provided a physical environment conducive towards delinquency. The cross-level interactions examined in this dissertation use the aggregate physical characteristics of place (e.g., density, dilapidation) and the individual opportunity and control characteristics, specifically the family characteristics and an adolescent's unstructured socializing with peers. There are no specific hypotheses or expectations other than to see whether characteristics of place matter more, or only, when adolescents spend considerable time in unstructured socializing or under certain family conditions (e.g., single parent families).

The second type of interaction effect is between gender and other individual-level characteristics. Time use is chosen because this opportunity factor is the most consistent with the framework for this dissertation and because of previous research findings indicating strong effects on delinquency (see, Osgood, Anderson, and Shaffer Forthcoming; Osgood et al. 1996). Additionally, there are reasons to look for the interaction effect. For example, males are often allowed to go further from home than girls, have less household chores than girls, and are generally given more freedom away from home and parents than are girls (Fuligni and Stevenson

1995; Posner and Vandell 1999). Further, criminologists are aware of the power of gender, meaning that boys are considerably more delinquent than girls. It will be interesting to examine, then, whether girls who spend considerable time in unstructured socializing approach the level of delinquency of boys who spend the same amount of time in unstructured socializing. There are no specific hypotheses, but the effect of time use will be tested to see if it interacts with gender or either of the other two opportunity factors, access to transportation and access to disposable income. The latter interactions are examined to determine whether the presence of unstructured time use increases the risk of delinquency when one of the other two forms of opportunity is present.

The final goal of this dissertation is to test whether the aggregate effects of the family variables are mediated (rather than moderated) by an adolescent's unstructured time use. While moderation determines the conditions under which the outcome is affected, mediation seeks to explain how or why the outcome occurs (see, Baron and Kenny 1986). The idea behind the mediation analyses in this dissertation, then, is to determine whether any family effects (family structure and parental monitoring) on delinquency are due to the amount of time an adolescent spends in unstructured socializing with peers in the absence of adults. Thus, unstructured time use is used again, but this time instead of interacting with family characteristics, I explore whether time use serves as the mechanism through which the family factors affect delinquency. Mediation would be supported if the family characteristics are related to delinquency, but then are no longer once the effect of unstructured time use is introduced. In this case, it is not family structure driving the relationship between family structure and delinquency. Rather, youth who live with only one parent or have low levels of parental monitoring may spend more time "just hanging out with friends" than do youth who live with two adults or have high monitoring.

Chapter 2: Methods

Data Collection

This research uses the National Longitudinal Study of Adolescent Health (Add Health) data collected by researchers at the University of North Carolina at Chapel Hill. The survey is a probability-based sample of adolescents in grades 7 through 12. The design of the study resulted in a school-based cluster sample where the schools had an unequal probability of being selected (Chantala and Tabor 1999). There were a total of 132 schools sampled, 80 high schools and 52 middle schools. The students within those schools were then eligible for selection for an In-School Questionnaire (n=90,118) or an In-Home Survey (n=20,745 for Wave I). This research uses the In-Home survey.

The students chosen for the In-Home survey were sampled from the school rosters and the adolescent completed the survey using audiotapes, headphones and laptop computers. The In-Home Survey is the longitudinal component of the study, and a Wave III has recently been added to the project. For those who were chosen for the In-Home Questionnaire, surveys were administered to the mother or other female head of household, where possible, to collect parental information about the child(ren) and limited information about the family. The parental survey was interviewer-administered by pencil and paper. The measure of poverty was the only information from the parent survey used in this dissertation.

Variable Selection

This section explains the operationalization of all measures used in the analyses that follow. This section begins with the individual-level variables, followed by the contextual

characteristics, and ending with the control variables. Table 1 presents the relevant descriptive information.

Individual-Level Variables

The four measures of delinquency, five opportunity factors, and the socio-demographic characteristics are all measured at the individual level. The individual-level control variables, which are individual-level variables aggregated to form school-level variables, are presented in a subsequent section following the contextual measures.

Delinquency

Four delinquency measures are used in the analyses: violent delinquency, property delinquency, heavy alcohol consumption, and marijuana use. There is no reason to expect the relationship of the explanatory variables to delinquency to be consistent across delinquency types, which is why a general delinquency index is not used. For instance, some youth may be more likely to participate in substance use than to engage in violent delinquency when the opportunity for delinquency presents itself.

Violence (Person) – This variable is a scale based on four questions. In the last 12 months, how often did you: 1) get into a serious physical fight? 2) hurt someone badly enough to need bandages or care from a doctor or nurse? 3) take part in a fight where a group of your friends was against another group? 4) use or threaten someone with a weapon? The respondent could choose never (coded 0), 1 or 2 times, 3 or 4 times, 5 or more times (coded 3) for each of the four questions. The resulting scale has a range from 0-12 and about 60% of respondents reported committing none of the four offenses used in the scale.

Property – This variable is a scale based on five questions. In the last 12 months, how often did you: 1) deliberately damage property that didn't belong to you? 2) take something from a store without paying for it? 3) steal something worth more than $50? 4) go into a house or building to steal something? 5) steal something worth less than $50? The respondent could choose never (coded 0), 1 or 2 times, 3 or 4 times, 5 or more times (coded 3) for each of the five questions. The resulting scale has a range from 0-15 and about 65% of respondents reported committing none of the five offenses used in the scale.

Heavy Alcohol Use – This measure is based on the single question, "Over the last 12 months, on how many days did you drink five or more drinks in a row?" The possible responses were never (coded 0), 1 or two days, once a month or less (3-12 times in the past 12 months), 2 or 3 days a month, 1 or 2 days a week, 3 to 5 days a week, and every day or almost every day (coded 6). Just over 73% of the sample did not report any heavy drinking in the last 12 months.

Marijuana Use – This variable is based on the single open-ended question, "During the past 30 days, how many times did you use marijuana?" The estimated number of times the respondent used marijuana was recoded into five categories. The categories, all of which refer to last 30 days, are: not in the last 30 days (coded 0), once in the last 30 days, bi-weekly, weekly, and daily. Almost 86% of the sample reported not smoking over the prior 30 days (coded 4).

Individual Opportunity

There are five opportunity characteristics included in the analyses: unstructured time use, access to disposable income, access to transportation, family structure, and parental monitoring.

Unstructured Time Use – The measure of time use is based on the single question, "During the past week, how many times did you just hang out with friends?" The responses ranged from 0 (not at all) to 3 (5 or more times). There were about 40% of adolescents who reported hanging out 5 or more times in the past week, while just over 9% reported not having done this at all in the past week.

Access to Disposable Income – Two variables were created based on three open-ended questions that asked adolescents how much money they made from summer jobs in an average week, non-summer jobs in an average week, and allowance each week. The responses were coded such that the highest amount of money made in a week from either a summer or non-summer job was $400 to reduce any bias in unusually high answers (less than 2% of respondents). The highest amount reported for allowance was $95. These three income measures, which were weekly totals, were adjusted to reflect the total yearly amount of disposable income. Specifically, the summer total was multiplied by 12 weeks, the non-summer total was multiplied by 40 weeks, and the allowance total was multiplied by 52 weeks. This estimated "yearly" total was divided by 52 weeks to derive a weekly total. The weekly total was used to create two variables. One variable represents those youth with no disposable income ("no money") and the other represents those youth who are in the top 15% of disposable income earners ("high disposable income").

Access to Transportation – A youth's access to transportation is assessed by one measure based on the question, "How many miles do you drive each week?" This original responses ranged from no amount of driving each week, 1-50 miles, 51-100 miles, and over 100 miles, and were recoded into a dummy variable representing those that drive at least one mile a week.[6]

[6] The analyses were conducted using both the original coding of the driving variable (i.e., number of miles driven) and the dummy variable representing those that drive any number of miles. Although both had a relationship with delinquency, the dummy variable had a slightly stronger relationship and was used in all the analyses to ease interpretation.

Approximately one half of the respondents reported driving some number of miles (at least one) each week.

Single Parent Families – This is a dummy variable for whether the respondent lives with only one person, in almost all cases a parent. The single parent family category (coded 1) includes both single mothers and single fathers. The two-parent category (coded 0) includes 2 people in the house, whether or not the two people are biological parents.

Parental Availability – The measure of parental monitoring is a scale based on two questions for each parent, totaling four questions. The questions asked the adolescent respondent whether the resident mother and resident father were at home when the adolescent left for school in the morning and when he or she returned home from school in the afternoon. The original response categories were never, almost never, sometimes, almost always, and always. The responses for each question and parent were recoded such that a score of 0 means the parent was there never or almost never, a 1 means the parent was there sometimes, and a 2 means that the parent was there always or almost always there. The parental availability measure used in the analyses ranges from 0-4 and is based on the highest monitoring score the adolescent received for both questions about when they leave for school in the morning and when they return home in the evening. For instance, an adolescent with a score of 4 has at least one person almost always or always at home when they leave for school in the morning and when they return home from school in the afternoon. That is, higher numbers represent more "parental availability." This recoding reduces bias caused for those with only one parent. I cannot assume that those with only one parent received any more or less direct monitoring than those with two parents even though the presence of two parents may make monitoring easier. Approximately 6% reported that neither their mother nor father is home when they leave for school and arrive home from school.

Socio-Demographic Characteristics

Age – The reported age of the adolescent respondent in 1995. The sample and analyses include only those youth between 13 and 19 years of age. There is also an age-squared term included in the analysis consistent with the age-crime curve because the relationship of age to crime is non-linear.

Race and Ethnicity – There are five dummy variables that represent the race or ethnicity of the respondent, one for each of the five following groups: Native Americans, Asian Americans, Non-Hispanic Blacks, and those of Hispanic origin, and non-Hispanic White/Caucasian. In the analyses that follow, the non-Hispanic White/Caucasian group serves as the reference category.

Sex – This is a dummy variable for whether the adolescent respondent was male. Almost 49% of respondents were male.

Socio-economic Status – This is a dummy variable for whether the family of the respondent received Aid for Dependent Families (AFDC), food stamps, or a housing subsidy. This measure is based on the parent response and over 14% of the respondents were classified as living in "poverty."

Contextual Characteristics

There are nine aggregate contextual characteristics included in this research: poverty, racial and ethnic heterogeneity, residential mobility, land use, density, dilapidation, family structure, parental monitoring, and time use. The aggregate version of the remaining two individual opportunity factors, access to disposable income and transportation, were also included in the analyses.

Poverty – This is the school contextual version of the individual-level poverty variable. It represents the proportion of students within each school whose parent had indicated the family received Aid for Families with Dependent Children (AFDC), food stamps, or a public housing subsidy. The schools in this sample range from not having any students within the school who are considered poor, to having 58% of the students within the school who are considered poor.

Racial and Ethnic Heterogeneity Index – When this index is equal to zero, there is no heterogeneity, or one dominant group (Blau 1977:9, footnote), and approaches 1 for maximum heterogeneity depending on how many groups are included in the measure. It is computed by taking dummy variables for race aggregated to proportions, squaring those proportions, and then summing those values and subtracting the total from 1. This computed measure is based on 5 groups: Native American, Asian/Island Pacific, Black (non-Hispanic), White/Caucasian (non-Hispanic), Hispanic. The heterogeneity within schools ranged from a low of 0, meaning all students are in the same group, to a .75, which is approaching total heterogeneity (i.e., .80 for each group having the same proportion of people in it).

Residential Mobility – The contextual measure for residential mobility was computed by taking the age of respondent and the answer to the question, "How old were you when you moved here to your current residence?" and subtracting the age moved to the current residence from age of the respondent. A dummy variable was created that represented those respondents who moved residences in the previous three years. This dummy variable was aggregated to create a school-level creating a measure of mobility that represented the proportion of students in each school that moved residences in the previous three years.[7] Schools in this sample range from a low of 15% of students who moved residences in the last 3 years to a high of 69% of students.

[7] The distance moved is not known.

Land Use – The school-level variables are based on the following question asked of the interviewer after the interview was over, "How would you describe the immediate area or street (one block, both sides) where the respondent lives?" The choices were: rural, suburban, urban, residential only, 3 or more commercial properties, mostly retail, 3 or more commercial properties, mostly wholesale or industrial, and other. The "other" category was set to missing. Four variables were made out of the choices such that the categories are: rural, suburban, urban/residential, and mixed-land use. There could have been confusion on the part of the interviewer properly determining the suburban, urban, and mixed-land use landscape. To ensure conservative estimates, the suburban and mixed-land use categories are added into the urban variable while still having separate variables. In this manner, the effect of either suburban or mixed-land use is above and beyond any "urban" effect. The suburban group is the reference category for the urban and mixed-land use groups in the analyses. The rural variable is relative to non-rural environments.

Single Parent Families – This is the proportion of single parent families within each school and is creating by aggregating the individual-level responses. The sample ranges from all of the students having two parents in the house to 62% of the students in the school living with only one parent.

Parental Availability – This measure of parental availability is the aggregated form of the individual-level parental availability variable. This aggregated scale could range from 0-4, but the sample has a range of 2.41 – 3.79 where higher numbers mean that more of the students within a school have someone at home both when they leave for school in the morning and when they get home from school in the afternoon.

Dilapidation – The school-level variable for dilapidation is the sum of two individual-level questions asked of the interviewer at the end of the interview. The first question was "How well kept is the building in which the respondent lives?" The second question was "How well kept are most of the buildings on the street?" The choices were very well kept (coded 1), fairly well kept (needs cosmetic work), poorly kept (needs minor repairs), and very poorly kept (needs major repairs; coded 4). The missing values were coded differently than the other variables with the exception of density. Specifically, if a youth was missing a score on one item but not the other (e.g., a neighborhood score but no individual score), the missing score was replaced with the score on the other variable. There were adolescents who had "true missing" scores (no score on either variable), and these missing values were replaced with the school mean. This was done because the neighborhood and individual score are likely to be more similar to each other than to the overall school mean. This aggregate measure ranges from 2.09 – 5.00 where higher numbers mean that more of the students within the school live in more poorly kept areas.

Density – The school-level variable for density is based on two individual-level questions asked of the interviewer at the end of the interview. The first question was "In what kind of building does respondent live?" The choices were a detached single- family house, mobile home/trailer, single parent row house or town house (2 or more attached units), divided home, small apartment (2 to 4 units), apartment building (5 or more units) and free access to the housing units. The missing values were coded differently than the other variables with the exception of dilapidation. Specifically, if a youth was missing a score on one item but not the other (e.g., a neighborhood score but no individual score), the missing score was replaced with the score on the other variable. There were adolescents who had "true missing" scores (no score on either variable), and these missing values were replaced with the school mean. This was done because the

neighborhood and individual score are likely to be more similar to each other than to the overall school mean. This variable works such that the higher numbers indicate more dense living structures, and ranges from 2.00 – 9.20.

Time Use – This is the school-level average of the level one opportunity variable. The level-two time use measure has a range of 1.06 – 2.35 where higher numbers indicate that a greater proportion of students within the school spend more time each week with friends.

Access to Transportation – This measure is the school-level average of the individual-level dummy variable representing those youth who drive more than 1 mile a week. The school-level variable represents the proportion of youth in school that drive "some number of miles", which is at least one.

Access to Disposable Income – These two measures are the school-level average of the individual-level variables and each one represents the proportion of youth in school in each category. In particular, one variable represents the proportion of youth in school without a disposable income. The other variable represents the proportion of youth, by school, in the top 15% of income earners.

Individual and Structural Control Variables

When a school-level variable is formed as a mean of an individual-level variable, it is appropriate to include both levels of the variable in an HLM model. This is necessary to establish contextual effects as compared to compositional effects. A contextual effect is an emergent effect, which means that there is some effect above and beyond the aggregation of individual effects. That is, the whole is greater than the sum of all the parts; the aggregate effect is above and beyond the individual effect. On the other hand, a compositional effect is simply the effect of aggregating individual characteristics that then have a combined effect on the dependent

variable, but that effect is not emergent – the effect is only the sum of the parts. For example, males commit more crime than females. A contextual effect is when more men than women in a setting creates an effect for everyone in the setting. A compositional effect would be that settings with more males have more crime because there are more males there, and each of them is more likely to commit crime than a female, but not more likely to commit crime than males in other settings. The males are the only ones at risk and the aggregated effect is really just the individual effect working at the aggregate level. Nevertheless, both levels of each variable are still needed, and this section describes the counter-parts to the variables discussed in the last two sections. These variables are only used for this statistical purpose and their effects are not discussed beyond the basic statistics included in this section.

Age – This is the school-level average of student's ages 13-19, recoded to be centered at age 16.

Sex – This is the school-level proportion of male students.

Race – The five individual-level dummy variables were aggregated to the school-level. There is a variable for each of the following groups: Native Americans, Asian Americans, Non-Hispanic Blacks, Hispanics, and non-Hispanic White/Caucasians. Each school-level variable represents the proportion of youth by school that identified with each group.

Land Use – These measures are the individual-level versions of the school-level variables. Specifically, after each interview the interviewer was asked, "How would you describe the immediate area or street (one block, both sides) where the respondent lives?" The choices were: rural, suburban, urban, residential only, 3 or more commercial properties, mostly retail, 3 or more commercial properties, mostly wholesale or industrial, and other. The "other" category was set to missing. The variables were made out of the choices such that the categories are: rural,

suburban, urban, and mixed-land use. Suburban land use is the reference category for the urban and mixed-land use variables in the analyses.

Mobility – The individual-level residential mobility measure was computed taking the age of respondent and the answer to the question, "How old were you when you moved here to your current residence?" and subtracting the age moved to the current residence from age of the respondent. The dummy variable represents those adolescents who lived in the current residence for 3 years or less.

Density – The density of the area surrounding the adolescents' home was a scale based on two questions asked of the interviewer after the interview was over. The first asked the interviewer, "In what kind of building does respondent live?" The second question asked the interviewer, "What type of residence is most common on the street (one block, both sides) where the respondent lives?" The responses for each question range from 1-6, where a one is a detached single- family house and a six is an apartment building with 5 or more units and free access to the housing units. The scale is the sum of the two questions and ranges from 2-12, where higher numbers represents greater density.

Dilapidation – The dilapidation of the area surrounding the adolescents' home was based two individual-level questions asked of the interviewer at the end of the interview. The first question was "How well kept is the building in which the respondent lives?" The second question was "How well kept are most of the buildings on the street?" The choices were very well kept (coded 1), fairly well kept (needs cosmetic work), poorly kept (needs minor repairs), and very poorly kept (needs major repairs; coded 4). The scale is the sum of the two questions and ranges from 2-8, where higher numbers represents greater dilapidation.

Number of Student Respondents in the School – This measure is the number of youth who answered the Survey within each school and is based on standardized scores. The original values ranged from 19 – 1695, however, the standardized score has a range of -.73 – 9.41.

Sample and Analysis Plan

The final sample consisted of 17,890 adolescents from 132 schools. The original sample was reduced for a number of reasons. First, the adolescents who had missing or out-of-range data for the school, the adolescent's gender, age, ethnicity or race, or any of the four forms of delinquency were removed from the sample. The data were manipulated to adjust for missing data on the remaining explanatory variables by replacing the missing data with the school mean. The school mean was used because both middle and high schools were included in the sample and several of the explanatory variables vary by middle and high school respondents. The most obvious example is the access to transportation, or the "driving" variable – the middle schools have lower means on the driving variable than the high school, because fewer (if any) students are driving in middle school. A dummy variable was created for each explanatory variable where respondent's missing scores were replaced with the school mean. This was done to control for any systematic differences between those who answered a question and those who had missing responses.

The cluster-sample design of the survey creates data issues that must be dealt with prior to any analyses (see, Chantala and Tabor 1999 for details). The most important issue is dependency, where individuals who share a social setting are more similar to each other than to those individuals in a different social setting. With these data, adolescents at one school are likely to be more similar to each other than to adolescents at another school. This dependency

with the data must be dealt with, and I use hierarchical linear modeling techniques (HLM) for that purpose (Bryk and Raudenbush 1992).

Another statistical issue that needs to be addressed is finding a statistical model appropriate for the distribution of the dependent variables. Specifically, linear modeling is not appropriate for the dependent variables for a number of reasons. For one thing, the dependent variable scales are whole integers that are positively skewed. Standard linear models would produce nonsensical predicted values and are not appropriate (Gardner, Mulvey, and Shaw 1995). Additionally, the data are skewed in a way that violates the assumption that the errors were normally distributed (Agresti 1996). Moreover, normal means for transforming the outcome variables cannot work because of the substantial proportion of cases at the minimum value (Bryk, Raudenbush, and Congdon 1996).

The analyses that follow used an overdispersed Poisson model. This was appropriate because the Poisson distribution assumes positive integers and it is consistent with large proportions of cases at the limiting value of zero. Aptly, this type of distribution is a probability model. The problem, however, is that the normal Poisson distribution fixes the variance to the means, which is unrealistic and biases significance tests (see, Osgood 2000). This assumption of fixed variance, for example, would mean that every delinquent act was independent of every other delinquent act, which is unrealistic. Moreover, this assumption would only be correct if the predictor variables perfectly explained the dependent variable, which is also unrealistic. This is why the overdispersed version of the Poisson distribution was used in the following analyses.

Table 1

Individual-Level Descriptives

Individual Characteristic n=17890	Mean	Minimum	Maximum
Dependent Variables			
Marijuana Smoking	.32 (.85)[a]	0	4.00
Alcohol Use	.66 (1.31)	0	6.00
Property Crime	1.10 (2.16)	0	15.00
Person Crime	1.01 (1.77)	0	12.00
Independent Variables			
Age, 13-19 years old (centered around 16 years old)	-.22 (1.64)	-3.00	3.00
Age Squared	2.73 (2.89)	0	9.00
Gender (male)	.49 (.50)	0	1.00
Non-Hispanic-White	.54 (.50)	0	1.00
Native American	.01 (.09)	0	1.00
Asian	.07 (.26)	0	1.00
Non-Hispanic Black	.21 (.41)	0	1.00
Hispanic	.17 (.38)	0	1.00
Socio-economic Status	.14 (.33)	0	1.00
Single Parent Family	.26 (.43)	0	1.00
Parental Availability Scale	3.06 (1.16)	0	4.00
Unstructured Time Use	1.98 (1.00)	0	3.00
No Disposable Income	.14 (.35)	0	1.00
High Disposable Income	.13 (.33)	0	1.00
Respondent Drives Some Number of Miles	.50 (.50)	0	1.00

[a] Standard errors in parentheses

Table 1, continued

School-Level Descriptives

School Contextual Variable n=132	Mean	Minimum	Maximum
Proportion In Poverty In School	.16 (14)[a]	0	.58
Proportion Moved in Last 5 Years or Less, or Mobility	.39 (.12)	.15	.69
Aggregate Racial/Ethnic Heterogeneity Index	.34 (.22)	0	.75
Aggregate Density Measure	3.23 (1.22)	2.00	9.20
Aggregate Dilapidation Measure	3.30 (.52)	2.09	5.00
Proportion Rural	.28 (.29)	0	.99
Proportion Suburban (reference category)	.38 (.26)	0	.98
Proportion Urban	.34 (.28)	0	.96
Proportion Mixed Land Use	.03 (.04)	0	.35
Proportion of Single Parent Families	.26 (.12)	0	.62
Aggregate Parental Availability	3.09 (.23)	2.41	3.79
Aggregate Time Use	1.97 (.20)	1.06	2.35
Proportion With No Access to Disposable Income	.15 (.09)	0	.53
Proportion of Students with High Disposable Income	.10 (.08)	0	.31
Proportion of Students that Drive Some Number of Miles	.43 (.27)	0	.91

[a] Standard errors in parentheses

Chapter 3: Results

The results discussed in this chapter came from analyses using the statistical software package HLM, or Hierarchical Linear Modeling. All explanatory variables presented in the following tables were grand-mean centered, which ensures the school-level coefficients are contextual effects over and above the individual-level effects (see, Bryk and Raudenbush 1992: 26). For reasons noted in the last section, overdispersed Poisson regression modeling within the HLM program was used for all four of the dependent variables (Bryk, Raudenbush, and Congdon 1996).

The coefficients correspond to mean levels of offending and are in a log linear metric that, when exponentiated, are in a multiplicative form for the original metric (see, Gardner, Mulvey, and Shaw 1995; Liao 1994). This metric ensures that all of the predicted values for the dependent variable will be greater than zero because the exponentiated coefficients are always positive. Statistically, in a multiplicative model such as this, a negative number becomes a fraction, which means that negative numbers result in a decrease in the expected count. The coefficients for these models are similar to logistic coefficients as they need to be exponentiated to determine the magnitude of the effect and are interpreted in terms of odds. The difference is that the outcome range is not constrained to be between 0-1 as with probabilities. The exponentiated coefficients are presented in the necessary tables for the reader's convenience.

First Steps – Baseline Analyses

Null Model

There are two sets of analyses presented in this section before the goal-fulfilling analyses of interest in the next six sections. The first analysis is a null model (i.e., no explanatory

variables) for each of the four dependent variables (see Table 2). The null model established baseline effects for the coefficients and variance components, which are both in a log-linear metric. The school-level variance components (i.e., u_0) are useful because they establish the amount of aggregate variance that might be explained by future models (see Table 3 for the variance components for all models).[8] An examination of the variance components in Table 3 indicates that there was more school-level variance to be explained in the two substance use variables than either property or person offenses. The exponentiated intercepts presented in Table 2 represent the average number of offenses per adolescent for each form of delinquency. For example, the exponentiated coefficient 1.02 for property offending means that the average number of property offenses for an adolescent is about one unit on the 1-15 scale.

Model 1

The next model, Model 1, consisted of the three main demographic correlates of offending, an adolescent's: gender, age, and race or ethnicity (see Table 4). This model was necessary in order to determine the effects of the other contextual variables included in the next several models. This was particularly important for substance use measures that are more age-dependent than the person and property delinquency measures. This is evident when examining the effect on the variance components. For example, notice the large drop in the heavy alcohol use measure once these basic correlates were included (i.e., from .342 to .073, Table 3).

The results of Model 1 presented in Table 4 show a negative relationship between age and both property and person offending and a positive relationship between age and the substance use measures. Age is centered around 16 years old and an age-squared term was included in the model, which means that the age variable is relative to the age trend for 16-year-

[8] Though the Poisson regression model includes an overdispersion term at the individual level, it does not have a metric that can be interpreted as an individual level variance component.

old youth. The youth who were younger than 16 years old were more likely to engage in property and person delinquency while the youth who were older than 16 years old were more likely to engage in substance use. The negative direction of the age-squared term indicates that offending was decelerating as the youth aged for all four forms of delinquency. The gender relationship was also consistent with previous findings that males are more likely to be delinquent than females. The race and ethnicity variables indicated lower rate of offending by Asian youth than White youth (the reference category) for all four dependent variables, and this was significant for the substance use measures. There was a higher rate of offending for both Hispanic youth and Native American youth than White youth for all four forms of delinquency. In particular, Native Americans had significantly higher rates of person offending and marijuana use than White youth. Hispanic youth had significantly higher rates of person offending than White youth. African-American youth had significantly lower rates of property offending and heavy alcohol use than White youth. African-American youth, however, had significantly higher rates of person delinquency than White adolescents.

The school-level variance components are reported in Table 3. The bottom of Table 3 presents the percentage explained at level two by each model. For Model 1, the addition of the correlates decreased the school-level variance (proportion explained, log-linear metric) for all four forms of delinquency, ranging from 27% for property delinquency to 79% for heavy alcohol use. The results suggest much of the variation among schools was due to substantial effects of these basic demographic correlates of delinquency, particularly for heavy alcohol use.

Goal One: Context Effects

The first goal of this dissertation outlined in a previous section was to examine contextual effects of opportunity factors. Two models examined contextual effects on the four forms of

delinquency. The first model presented in this section includes the physical contextual characteristics of the neighborhood environment. The second model in this section adds the family characteristics. This was done for two reasons. The first is that the school-level physical characteristics of the residential environment can be viewed as being more exogenous than the family characteristics. The second reason is that a statistical examination revealed differences between these two groups in explaining differences between school means while there were fewer differences within group (i.e., differences between the physical and family characteristics). In particular, the first model, Model 2, included the neighborhood physical characteristics of density, dilapidation, proportion of youth within a school living in rural areas, the proportion of youth within a school living in urban areas, and the proportion of youth within a school living in mixed land use areas. In addition to the school-level residential characteristics, the school-level "social disorganization" variables of poverty, ethnic and racial heterogeneity, and residential mobility were also included. The reference group for the rural variable is non-rural. For the urban and mixed-land use variables, the reference category is the proportion of youth within a school who live in suburban areas. The second model in this section, Model 3, adds the family variables, family structure and parental availability, at both the individual-level and the school-level.

Model 2

Table 5 presents Model 2, which extended Model 1 by adding eight contextual variables and one individual-level variable. The individual-level effects are presented in the first half of Table 5 while the school-level context effects are presented in the second half. At the individual-level, the added individual characteristic, socio-economic status, was significantly related to person offending and marginally related to both forms of substance use. The remaining level-one

variables did not change significantly. This is because the introduction of contextual variables does not affect the level-one coefficients other than to move small amounts of variance between the two levels.

A quick examination of all four dependent variables and the context effects presented on the second page of Table 5 shows that many of the contextual effects were not significant, although others are large. Recall the coefficients were grand-mean centered and the appropriate level-one variables were included, which ensured that that the level-two coefficients were context effects. One thing to note is that the contextual characteristics were more significantly related to property crime than to the other three forms of delinquency. Interestingly, the effect of school-level poverty on property crime was negative and significant, meaning that as the proportion of students in a school who were from poor families increased, a youth's likelihood for property offending decreased. Attending a school with a high level of poverty was positively related to the other three forms of delinquency, with a significant association between poverty and marijuana use and a marginally significant relationship between poverty and person offending. School-means for both racial and ethnic heterogeneity and dilapidation were positively related to all four forms of delinquency, and both were significantly related to property crime.[9] School-level residential mobility was positively related to all forms of delinquency except alcohol use, but was significantly related only to person delinquency. The direction of the context effect for density was split. There was a positive relationship of mean density with property and person delinquency, but a negative relationship with substance use. That is, as the average housing density of those students within a school increased, the likelihood that any one youth would engage in property and person delinquency increased, but the likelihood of substance use decreased. This relationship with property and person delinquency supports earlier

[9] The dilapidation effect on person offending was positive, but not different from zero.

assertions that density should be positively related to delinquency. The negative mean density relationship with substance use was unexpected. It may be that housing density serves to decrease substance use by increasing the risk of detection.

The school-level neighborhood land use variables (second half of Table 5) indicate that as the proportion of youth living in rural areas increased within the school context, the likelihood of all four forms of delinquency decreased relative to schools with more non-rural youth. This effect was significant for property offending and marijuana use. There was little difference between urban youth and suburban youth for property delinquency, person delinquency, and heavy alcohol use. Those adolescents in schools with more youth from urban areas had lower rates of marijuana use than suburban areas (27% lower), although this effect was not significant. Finally, the adolescents from schools with more youth from mixed-land use areas had higher rates of offending than adolescents in schools with more youth from suburban areas, particularly for the two forms of substance use. Although only the coefficient for heavy alcohol use was significant, three of the four effects of mixed land use were quite large. The negative rural effect and the positive effect of mixed land use on delinquency was consistent with hypotheses. The negative school-level effect of urban residential land use (with suburban land use serving as the reference group) was unexpected. The expectation was that those youth attending schools where many youth were from suburban residential environments would have lower crime rates than youth attending schools where many youth came from urban areas because of the lack of guardianship and increase in opportunities for urban youth.

Finally, the between-school variance components presented in Table 3 show a substantial reduction in the variance of both property and person delinquency. In fact, the variance components for both property and person delinquency were halved (see bottom half of Table 3).

The substance use variance components were also reduced, but to a lesser degree. Model 2 was most effective explaining person delinquency (55% from Model 1) followed closely by property delinquency (50% from Model 1) and least effective explaining heavy alcohol use (8% from Model 1).[10] Thus, the school-level physical characteristics of the neighborhoods of youth were useful for explaining property and person delinquency.

Model 3

Model 3 added the family variables, family structure and parental availability, to Model 2 (see Table 6). The level-one effects presented in the first part of Table 6 indicate a positive effect for family structure and a negative effect for parental availability. That is, living in a single parent family increased an adolescent's risk for all four types of delinquency while having at least one parent around when the youth leaves and returns from school decreased the risk for all four forms of delinquency. In fact these effects are almost offsetting with the exception of marijuana use. For example, the difference between having one adult in the house versus two adults for an adolescent translated to an 8% higher risk for person offending, while one unit of parental monitoring decreased the risk by about 5%.

The contextual effects of school means for the family factors presented in the second half of Table 6 followed the same general pattern as the individual-level effects. In particular, there was a positive relationship between school-level family structure (i.e., proportion of single parent families) and all four forms of delinquency and a negative relationship between school-level parental availability and all four forms of delinquency. Additionally, almost all of the contextual

[10] Recall that the level-two versions of the level-one socio-demographic characteristics were included in the models. The between-school variance explained resulted from both the school-level socio-economic factors (not reported in the tables) and the school-level opportunity variables. I re-ran these models with only the level-one versions of the contextual characteristics and again adding in the level-two contextual effects. This was done to determine whether the school-level variance explained was due to the level one or level two variables. The results suggest that much of the between-school variance explained for all four dependent variables and all four models is due to the level-two opportunity characteristics.

effects are quite large relative to the individual-level effects. There was a large significant context effect of family structure on the substance use measures and a moderate but not significant effect on both property and person offending. The contextual effect of family structure partially supports Anderson's (2002) research, which found a positive contextual effect of family structure on person delinquency but a negative contextual effect on property crime.

The contextual parental availability measure had a negative effect on all four forms of delinquency and the effect was significant for all but heavy alcohol use. The most sizable relationship was for marijuana use, where the difference between all students having neither parent home at either time (before or after school) and all students having at least one parent home at both times decreased the odds of marijuana use by about 43% (i.e., (exp -.57) = .57, which is subtracted from 1 for .43 or 43%). This makes sense in terms of opportunity factors because youth would find it hard to participate in this form of substance use while an adult was home. The results indicate that if everyone has an adult at home the rate of marijuana use, property and person delinquency is significantly decreased.

Many of the other contextual characteristics maintained their relationship to the four forms of delinquency after the introduction of the family characteristics. One exception is the school-level poverty variable. The effect size was reduced and was no longer significant for property offending although it was still negative, and was reduced for both of the substance use measures once the family variables were introduced. The effect size of the mixed-land use variable also increased for all four forms of delinquency. For marijuana use, dilapidation was reduced to a negligible and negative effect. Interestingly, the effect for residential mobility changed directions for marijuana use with the introduction of the family variables. The

previously positive effect became negative, meaning that stability increases marijuana use. Marijuana use is generally a peer-centered activity and stability may be necessary for youth.

Overall for Model 3, the addition of the family contextual variables changed several of the effects presented in Model 2. Specifically, school-level poverty and school-level neighborhood dilapidation were less important for property offending. School-level racial and ethnic heterogeneity and school-level neighborhood mixed-land use were more significantly related to property and person (violent) delinquency. Additionally, the school-level neighborhood density and mixed-land use characteristics were more significantly related to marijuana use than in the previous model, with density reducing marijuana use and mixed land use increasing marijuana use.

Finally, the between-school variance components presented in Table 3 show that all four variance components were reduced with the addition of the contextual family characteristics, relative to Model 2. In particular, the bottom of Table 3 shows that Model 3 was most effective explaining between-school means for property delinquency (27% reduction in variance from Model 2) followed by marijuana use (25% reduction from Model 2), and least effective for heavy alcohol use (10% reduction from Model 2). Overall, the contextual effects were useful for explaining the between-school variance in property and person delinquency. The bottom of Table 3 shows the percentage of the between-school variance explained between models. For example, the variance components for person delinquency dropped from .051 before the introduction of the context effects (i.e., Model 1) to .019 after all of the context effects were added (i.e., Model 3), a 63% reduction. While the context effects were also useful for explaining marijuana use, the usefulness of the context effects on heavy alcohol use was minimal.

There are three findings from Model 3 worth highlighting. First, there were large school-level contextual effects for single parent families on delinquency, particularly on the substance use measures. This indicates that as the proportion of youth in a school that lived with only one parent increased, the rates of all forms of delinquency increased for all adolescents regardless of any one youth's family structure. Second, there was also a large school-level effect for neighborhood mixed-land use. This indicates that youth attending schools where many students lived in mixed land use settings were at increased risk for delinquency, regardless of the residential environment of any particular student. Finally, there was a substantial relationship between school-level parental monitoring and delinquency. That is, as the proportion of students in school who were exposed to lower levels of monitoring increased, so did the delinquency of all students in the school regardless of any one student's monitoring. This emphasizes the importance of school-level guardianship, particularly by parents.

Goal Two: Opportunity Effects

Model 4

The second goal of this dissertation was to establish the effects of the opportunity factors. Two such characteristics, those representing family, were discussed in the last section. This section examines the addition of the remaining opportunity characteristics, unstructured time use, disposable income, and transportation, which was accomplished by Model 4 (see Table 7). These opportunity factors were included at both the individual and school-level. Recall there are two disposable income variables, no disposable income and high disposable income (top 15% of disposable income earners).

The first part of Table 7 shows the individual-level results of Model 4. The effect of both unstructured socializing (time use) and driving at least one mile a week were positive and significant for all four forms of delinquency. Additionally, the increased risk was higher for substance use than the increased risk associated with property and person offending. The two variables for an adolescent's access to disposable income had an interesting pattern. First, the adolescent's who did not have any disposable income had lower rates of offending than those adolescents with access to disposable income for all four forms of delinquency, and this effect was significant for heavy alcohol use. Second, the adolescents who were in the top 15% of income earners had higher rates of offending for all four forms of delinquency than all other adolescents. This relationship was significant for person offending and both forms of substance use, but there was little difference between those in the top 15% of income earners and the other youth for property crime. This pattern of results was expected for the substance use measures, as heavy alcohol use and marijuana use both require money to purchase. The higher rate of person offending for those in the high disposable income group was surprising as it was expected that the youth with no disposable income would have higher rates of person delinquency than those with a disposable income.

The school-level context effects presented in the second half of Table 7 indicate a positive relationship between the average amount of time spent in unstructured socializing by students attending a school and all four forms of delinquency. Further, this effect was significant for person delinquency and both types of substance use. Thus, as the amount of unstructured socializing for all youth within a school increased, so did the risk of an adolescent committing all four types of delinquency. This is consistent with Osgood and Anderson's (2001) research that found a contextual effect for unstructured socializing with peers on a general delinquency index.

Interestingly, the proportion of students within a school who drive some number of miles was negatively related to all four forms of delinquency, and this effect was marginally significant for property offending, person offending and marijuana use. I have no explanation for this effect.

The context effects for the two disposable income variables were also interesting although none of these contextual effects were significant. Adolescents attending schools with more youth without disposable income had lower rates of property delinquency and both forms of substance use than adolescents in schools with disposable income, but higher rates of person offending. Additionally, as the proportion of high disposable income earners in a school increased, so did the rate of both property and person offenses. This may reflect access to suitable targets (e.g., property). On the other hand, the rate of substance use was lower in schools with many high disposable income earners, most notably marijuana use. This was not expected because both forms of substance use require disposable income (in theory), and the idea was that more youth in a school with disposable income should increase access to both substances for all youth.

The addition of the opportunity factors changed a few of the contextual effects from Model 3. For example, the school-level poverty effect changed across the four forms of delinquency. For property crime, the context effect of poverty became stronger, meaning that as the proportion of students within the school that were poor increased from none to all of them, the risk of an adolescent within that school committing property crime further decreased from Model 3 (45% less likely versus 57% less likely). Two forms of delinquency, person delinquency and marijuana use, had reduced relationships with school-level poverty. In particular, the effect of school-level poverty was reduced to insignificance in Model 4 for person delinquency, and the likelihood was reduced by nearly 100% for marijuana use. For heavy alcohol use, little

difference was found between youth attending schools where all adolescents were poor and schools where all adolescents were not poor. This may indicate that the opportunity factors of Model 4 serve as a more proximal explanation for delinquency than poverty.

Similarly, the relationship between all four forms of delinquency and the proportion of students living in rural areas changed with the addition of the opportunity factors. Specifically, the relationship was reduced for property and person delinquency and marijuana use, with all of these relationships moving closer to zero. A negligible relationship presented in Model 3 for heavy alcohol use became positive. In Model 4 all the students in a school living in rural areas rather than non-rural areas increased heavy alcohol use by 14% (i.e., exp .13 = 1.14). There was still a significant negative relationship between both marijuana use and property delinquency, meaning the mean rate of offending when all students in a school lived in rural areas compared to when all students lived in non-rural areas was decreased by about 46% for marijuana use and by 24% for property offending. This may reflect the lack of opportunities in rural areas for these two types of offending.

The likelihood of offending across all four forms of delinquency became slightly larger for the effect of ethnic and racial heterogeneity after adding the opportunity factors. The school-level residential mobility measure that changed from positive to negative between Model 2 and Model 3 for marijuana use changed back to positive in Model 4. The risk for marijuana use increased for the difference between schools of youth from mixed-land use areas relative to comparable suburban youth, while the risk for heavy alcohol use decreased. The risk of both types of substance use increased for youth in a school where all students live with one parent compared to a school where all students live with both parents. This evidence of increased

effects for some explanatory variables may suggest a suppressor effect of the opportunity characteristics.

To sum, the contextual effects that were significant changed little with the exception of effects on marijuana use. The school-level effect of poverty on property delinquency that was significant in Model 2 and insignificant in Model 3 became significant again in Model 4. The school-level effect for poverty and parental availability on person delinquency that was significant in Model 3 became insignificant in Model 4. Finally, the contextual effect of parental availability that was significant in Model 3 became insignificant, while the contextual effects of racial and ethnic heterogeneity and urban became significant. Generally, the opportunity factors seemed to mediate the relationship between both poverty and parental availability and delinquency.

The between-school variance components (Table 3) were slightly reduced with the exception of heavy alcohol use between Model 3 and 4. This suggests that the additional three opportunity factors at level two were not impressive predictors in terms of explaining between-school variance. Moreover, for heavy alcohol use, the additional school-level opportunity factors increased the variance. This is due to some level-one variance shifting to level two when the opportunity factors were introduced, creating more variance around the school-means. The additional three school-level opportunity factors were most effective explaining between-school differences in marijuana use (15% from Model 3) and least effective for heavy alcohol use followed by property crime.

Comparing across all models, there are some notable changes to the variance components presented in Table 3. First, the contextual characteristics were particularly useful for explaining differences between schools in property delinquency. In particular, the physical characteristics of

Model 2 explained 50% of the variance that remained from Model 1 and the family characteristics explained 27% of the variance that remained from Model 2. This pattern for property crime was paralleled closely by person delinquency. Specifically, the school-level physical characteristics of the residential environment explained 55% of the variance remaining from Model 1 and the family characteristics explained 17% of the variance remaining from Model 2.

Finally, the bottom of Table 3 presents two additional sets of percentages. The first set is the proportion explained by all the variables (i.e., from the null model to Model 4). It is clear that the school-level versions of the correlates of crime were especially relevant for explaining between school differences in heavy alcohol use, explaining 79% of the between-school variance from the null model, but only explaining 82% total across all models. This suggests that relative to the correlates of crime (i.e., age, race and ethnicity, and gender), the opportunity factors offered very little to the explanation of heavy alcohol use.

The second set of percentages is the proportion of the between-school variance explained once the correlates have been considered (i.e., from Model 1 to Model 4). That means that the variance from the introduction of the correlates only is the starting point for assessing the percentage explained. The total percentage explained in the bottom row of Table 3 show that 69% of the between-school variance in person offending that was left after the correlates were introduced was explained by the opportunity factors, followed by property crime with 65%, followed by marijuana use with 53% of the between-school variance left after the correlates were introduced being explained.

Three findings from Model 4 are worth highlighting. First, the three individual-level opportunity characteristics (unstructured time use, access to disposable income, and access to

private transportation) and the two individual-level family characteristics (living in a single parent family, and parental monitoring) were almost all significantly related to all four forms of delinquency. Moreover, most of these relationships were in the expected direction. Second, the contextual effect of unstructured socializing with peers was large and significant for most forms of delinquency, particularly the two substance use measures. This indicates that as the proportion of time spent in unstructured socializing for all youth in a school increased, so did the risk for delinquency and especially substance use, regardless of how much time any one youth spent in this way. Finally, there were large and significant effects of both school-level single parent families and school-level neighborhood mixed-land use on the two substance use measures. Again, as the proportion of youth in a school from either a single parent family or from a mixed-land use residential setting increased, so did the risk of substance use above and beyond any individual-level effect. These findings are consistent with previously stated hypotheses.

Goal Three: Conditional Context Effects

This section addresses the third goal of this dissertation, the potential for conditional effects, or interactions. The idea behind testing for the interactions was to detect whether the physical characteristics of the social setting mattered more when opportunity factors were in play. While all of the potential interactions for Table 8 were tested, only the significant coefficients are included in the table. To further ease interpretations and reduce the complexity of a complete table of significant interactions, those interactions that were significant ($p<.05$) are graphed and presented as Figures.

The school-level physical characteristics of the places students lived examined with the contextual interactions were density, the land use type, and dilapidation. The opportunity characteristics that were used in the interactions with these physical characteristics were time use

and the family variables of family structure and parental availability. This test for moderation is most appropriate for parental availability because moderators are best introduced when there is an inconsistent or weak relationship between the independent and dependent variables when a stronger relationship was expected (see, Baron and Kenny 1986). In addition to these interactions, three interactions from social disorganization theory are tested: the interactions between poverty, residential mobility, and racial or ethnic heterogeneity.

The first three sets of interactions (see Table 8) interact the contextual opportunity characteristics unstructured time use, family structure, and parental monitoring with the school-level physical characteristics of rural, urban, and mixed-land use. Regarding contextual unstructured socializing with peers, there was a negative interaction between the contextual time use measure and rurality for both property (see Figure 1) and person (see Figure 2) delinquency. This indicated that rural youth were less affected by time use. That is, for adolescents who attended schools with a high proportion of rural youth spending considerable time in unstructured activities with peers brought less risk for both property and person delinquency than it would at schools with many non-rural youth. On the other hand, the time use/urban land use interaction was positive for both property (see Figure 3) and person (see Figure 4) delinquency. When many youth are participating in unstructured socializing in an urban area, the risk for both property and person delinquency was significantly increased, by over 200% for both compared with youth who attended school with a high proportion of suburban youth. This pattern of interactions (negative rural interaction and positive urban interaction) is consistent with the opportunity focus of this dissertation. That is, adolescents who attended school where many youth spent considerable time not doing anything in particular (high time use) and also where

many youth lived in more populated land use areas had the highest rates of both property and person delinquency.

There was also a positive significant interaction effect of rurality and family structure on heavy alcohol use, meaning rural youth were more affected by contextual family structure. As Figure 5 demonstrates, a high proportion of youth attending a school where many youth lived with only one parent was particularly detrimental for youth who attended school with a high proportion of youth from rural areas for heavy alcohol use. The last land use interaction of significance was that of urban land use and parental availability on person delinquency (see Figure 6). In particular, the interaction was negative, which means that greater parental availability within a school had more impact of decreasing person delinquency for the youth attending schools where many of the students were from highly urban schools than in schools where many of the youth were from low urban areas.

The next set of tested interactions involved the school-level physical characteristics of residential environments and family contextual characteristics. There was a significant interaction effect between contextual family structure and density on heavy alcohol use. The negative interaction effect on heavy alcohol use indicated that as the proportion of youth who lived with only one parent within a school increased, for those youth in high-density areas the risk of heavy alcohol use decreased. On the other hand, Figure 7 demonstrates that the proportion of youth who lived with only one parent within a school increased, for those youth in low-density areas the risk of heavy alcohol use considerably increased. This effect may indicate that the effect of high density somehow overcomes the lack of intact family structures or that there is less guardianship over youth in schools where many youth are from areas of low density.

The last sets of interactions examined were among the social disorganization effects. The empirical examinations determined whether there were interactions between poverty and mobility, poverty and racial and ethnic heterogeneity, and racial and ethnic heterogeneity and mobility and all four forms of delinquency. None of these interactions were significant for person delinquency and both forms of substance use, but there were interaction effects on property delinquency. In particular, there was an interaction effect of poverty and mobility (see Figure 8). Higher rates of mobility compared with lower rates of mobility produced about a one-unit increase in property crime at schools where a higher proportion of youth lived in poverty than schools where few students lived in poverty. Perhaps interestingly, youth in low poverty and low residential mobility schools had similar rates of property offending as youth in high poverty and high mobility schools.

Finally, there was a significant positive interaction of racial and ethnic heterogeneity and poverty on property delinquency. Figure 9 demonstrates that racial and ethnic heterogeneity increased the rate of property crime for youth who attend school where many youth are poor. For youth who attended school where a low proportion of the students lived in poverty, the effect of heterogeneity was negligible on the risk for property delinquency, although the rate of offending was still higher than youth in highly diverse and high poverty schools. Both of these social disorganization interactions were expected based on previous ideas outlined by Smith and Jarjoura (1988), although the third interaction, residential mobility and heterogeneity, was expected as well but was not found.

Goal Four: Cross-Level Interactions

This section addresses the fourth goal of this dissertation, the potential for cross-level interactions. Cross-level interactions in this dissertation examine whether school-level

characteristics differentially affect groups when differentiated by an individual level variable. All potential interactions in Table 9 were tested, but only the significant coefficients are presented. Additionally, the interactions that were significant at the $p<.05$ level are presented in graphical form as Figures. The cross-level interactions tested included all of the contextual interactions examined in the last section, namely that of the school-level physical characteristics of residential environments and individual opportunity characteristics. In addition to those that were examined in the last section, a final interaction between adolescent unstructured time use and school-level unstructured time use for all four forms of delinquency was tested.

Table 9 shows significant interactions between the amount of time that an adolescent spent in unstructured socializing and the land use characteristics of students' residential environments. There was a positive coefficient for the effect of individual unstructured time use by school-level mixed land use interaction on property crime. Figure 10 shows that as an adolescent spent more time in unstructured socializing, the rate of property offending increased at a faster pace for youth from schools where many youth came from mixed-land use areas rather than suburban areas. Nevertheless, there were higher rates of offending for adolescents attending school where many youth lived in low mixed-land use areas regardless of the amount of time an adolescent spent in unstructured socializing.

The remaining significant interactions included interactions between the school-level physical characteristics of the residential environment and family structure and the substance use measures (see Table 9). As Figure 11 demonstrates, an adolescent's family structure decreased heavy alcohol use for youth attending school where many youth come from mixed-land use areas. Figure 11 also demonstrates that the rate of offending is considerably higher for youth attending schools where many youth come from mixed-land use areas. Generally, the effect of

living in a single parent family depends on how mixed the land use, in this case low mixed use (positive effect) compared with high mixed use (negative effect).

Figure 12 shows the family structure by school-level neighborhood density interaction on heavy alcohol use. In particular, when an adolescent lived with only one parent, the rate of heavy alcohol use increased for youth that attended schools where many youth lived in areas that were not dense when compared to dense areas. In fact, in dense areas, the rate of heavy alcohol use was decreasing slightly for youth in single parent families rather than increasing as it was in school where many students were from low-density areas. This is not inconsistent with the opportunity focus of this dissertation because the adolescents with the lowest rate of heavy alcohol use live with both parents and in high-density areas. This could be consistent with previous arguments because school-level neighborhood density may produce some guardianship abilities, rather than decreasing guardianship, as was hypothesized earlier in this dissertation.

Finally, Figure 12 demonstrates the interaction between family structure and dilapidation on marijuana use. While youth with two parents have similar rates of marijuana use regardless of neighborhood dilapidation, youth in single parent families had higher rates of offending when they attended schools where many youth were from areas with lower levels of dilapidation rather than higher levels of dilapidation. It is interesting that for adolescents in single parent families, the highest risk of substance use falls in the lower levels of the school-level physical characteristics of residential environments (e.g., low dilapidation, low density).

Goal Five: Individual Time Use Interactions

The final goal involving interactions, goal five, concerned the effect of individual-level time use, or unstructured socializing with peers, on gender (a major predictor of delinquency), and the other two opportunity factors, access to disposable income and access to transportation.

Table 10 includes all of the tested interactions but only the significant coefficients are presented. Additionally, the interactions that were significant at $p<.05$ are presented in graphical form as Figures.

Figure 14 shows the relationship between an adolescent's time use and access to disposable income on property crime. Time use has a steeper slope for youth without a disposable income ("no money") compared with adolescents with some disposable income. Thus, although there is some difference in the low end of time use for youth with and without access to disposable income in rate of property offending (adolescents with access to disposable income had higher rates of offending), both groups had similar rates of offending when an adolescent spent considerable time in unstructured socializing with peers.

Figure 15 shows the relationship between an adolescent's time use and whether the adolescent drives any number of miles on person delinquency. This relationship shows that adolescents who spent little time in unstructured socializing had similar rates of offending regardless of whether the adolescent reported driving any number of miles. In the high category of unstructured time use, however, youth who drove some number of miles had higher rates of offending then youth that did not drive. Finally, Figure 16 shows the relationship between an adolescent's time use and the gender of respondent on heavy alcohol use. The effect of time use differed for males and females, in particular, the effect of time use on heavy alcohol use was greater for males.

Goal Six: Mediating Effects of Individual Opportunity and Socio-Demographic Characteristics on Context

Finally, and consistent with the last goal of this dissertation, the mediating effects of unstructured time use were examined. Baron and Kenny (1986) outlined the steps for testing for

mediation. First, the independent variable must affect the mediator. Consistent with this first step, a set of regression analyses were conducted to determine if unstructured socializing with peers was affected by the family characteristics. The results indicated significant effects ($p<.01$) for both family structure and parental monitoring on unstructured time use. Second, the independent variables must affect the dependent variable (Baron and Kenny 1986). Accordingly, a regression equation was estimated without the unstructured time use variable for each dependent variable. Results indicated significant effects ($p<.05$) for both the family structure and parental availability on all four dependent variables. Finally, the mediator must affect the dependent variable in a model with both the independent variables and the mediator, and the effect size for the independent variables should be reduced (Baron and Kenny 1986). A perfect mediator would reduce a previous effect size to zero. Although none of the effect sizes were significantly reduced, all effects were at least slightly reduced (see Table 11). Table 11 shows that the coefficients for family structure on the substance use measures were most affected by the mediating effects of time use. Based on this evidence, there was only modest support for the mediating effect of unstructured time use on delinquency, with most evidence supporting the mediation of single parent families.

Table 2

Null Model – Regression Coefficients for Delinquency Offenses

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
DEPENDENT VARIABLES	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
Overall Intercept	.015 (.04)	1.02	-.004 (.03)	1.00	-.670*** (.06)	.51	-1.413*** (.06)	.24

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 3

Variance Components

SCHOOL-LEVEL VARIANCE COMPONENTS	PROPERTY	PERSON	ALCOHOL USE	MARIJUANA USE
NULL MODEL				
School-level variance, u_o	.121***	.084***	.342***	.365***
Level 1 Overdispersion Term	4.007	2.947	2.479	2.080
MODEL ONE				
School-level variance, u_o	.088***	.051***	.073***	.247***
Level 1 Overdispersion Term	3.867	2.711	2.508	2.024
MODEL TWO				
School-level variance, u_o	.044***	.023***	.067***	.182***
Level 1 Overdispersion Term	3.862	2.670	2.480	2.027
MODEL THREE				
School-level variance, u_o	.032***	.019***	.060***	.136***
Level 1 Overdispersion Term	3.843	2.660	2.470	2.024
MODEL FOUR				
School-level variance, u_o	.031***	.016***	.061***	.112***
Level 1 Overdispersion Term	3.790	2.601	2.371	1.964

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

PROPORTION OF EXPLAINED VARIANCE	PROPERTY	PERSON	ALCOHOL USE	MARIJUANA USE
Model 1 from the Null Model	27%	39%	79%	32%
Model 2 from Model 1	50%	55%	8%	26%
Model 3 from Model 2	27%	17%	10%	25%
Model 4 from Model 3	3%	16%	-2%	18%
Total Explained Between Null Model & Model 4	74%	81%	82%	69%
Total Explained Between Model 1 & Model 4	65%	69%	16%	55%

Table 4

Model 1

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
INDIVIDUAL-LEVEL VARIABLES								
Overall Intercept	-.04	.96	-.08**	.92	-.65***	.52	-1.41***	.24
	(.03)		(.03)		(.03)		(.05)	
Age	-.09***	.91	-.07***	.93	.26***	1.30	.18***	1.20
	(.01)		(.01)		(.01)		(.02)	
Age Squared	-.04***	.96	-.02***	.98	-.04***	.97	-.06***	.94
	(.01)		(.01)		(.01)		(.01)	
Gender	.49***	1.63	.74***	2.10	.36***	1.43	.35***	1.42
	(.03)		(.03)		(.03)		(.04)	
Native American	.10	1.11	.41**	1.51	.01	1.01	.55***	1.73
	(.14)		(.11)		(.15)		(.16)	
Asian	-.09	.91	-.10	.91	-.77***	.46	-.75***	.47
	(.06)		(.06)		(.08)		(.10)	
Non-Hispanic Black	-.11*	.90	.33***	1.39	-.73***	.48	-.08	.92
	(.05)		(.04)		(.06)		(.07)	
Hispanic	.07	1.07	.35***	1.42	.02	1.02	.10	1.11
	(.05)		(.04)		(.05)		(.07)	

Table 5

Model 2

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
INDIVIDUAL-LEVEL VARIABLES								
Age	-.09***	.91	-.07***	.93	.25***	1.28	.17***	1.19
	(.01)		(.01)		(.01)		(.02)	
Age Squared	-.04***	.96	-.02***	.98	-.05***	.95	-.06***	.94
	(.01)		(.01)		(.01)		(.01)	
Gender	.49***	1.63	.74***	2.10	.36***	1.43	.35***	1.42
	(.03)		(.03)		(.03)		(.04)	
Native American	.07	1.07	.38***	1.46	-.01	.99	.52**	1.68
	(.14)		(.11)		(.15)		(.16)	
Asian	-.09	.91	-.14*	.87	-.82***	.44	-.79***	.45
	(.07)		(.06)		(.08)		(.10)	
Non-Hispanic Black	-.14**	.87	.24***	1.27	-.77***	.46	-.14*	.87
	(.05)		(.04)		(.06)		(.07)	
Hispanic	.05	1.05	.27***	1.31	-.02	.98	.04	1.04
	(.05)		(.04)		(.05)		(.07)	
Socio-Economic Status	.05	1.06	.18***	1.20	.09†	1.09	.11 †	1.12
	(.05)		(.04)		(.05)		(.07)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 5, continued

Model 2

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
SCHOOL-LEVEL VARIABLES (LEVEL 2)								
Overall Intercept	-.07**	.93	-.12***	.89	-.68***	.51	-1.45***	.24
	(.03)		(.02)		(.03)		(.05)	
School-level Poverty	-.95**	.39	.48 †	1.62	.62	1.86	1.31*	3.71
	(.35)		(.26)		(.40)		(.62)	
School-level Ethnic and Racial Heterogeneity	.48**	1.62	.17	1.18	.10	1.11	.32	1.38
	(.16)		(.12)		(.19)		(.29)	
School-level Residential Mobility	.31	1.36	.59**	1.80	-.06	.94	.15	1.16
	(.28)		(.22)		(.35)		(.52)	
School-level Density	.07 †	1.07	.02	1.02	-.15**	.86	-.11	.90
	(.04)		(.03)		(.05)		(.08)	
School-level Dilapidation	.15*	1.16	.00	1.00	.07	1.07	.09	1.09
	(.07)		(.06)		(.09)		(.14)	
School-level Proportion Rural	-.54***	.58	-.15	.86	-.06	.94	-1.17***	.31
	(.14)		(.11)		(.16)		(.26)	
School-level Proportion Urban	.03	1.03	-.10	.91	-.06	.94	-.31	.73
	(.16)		(.12)		(.20)		(.29)	
School-level Proportion Mixed Land-Use	.07	1.07	1.03	2.80	2.72*	14.30	2.37	10.70
	(1.02)		(.78)		(1.30)		(1.95)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 6

Model 3

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
INDIVIDUAL-LEVEL VARIABLES								
Age	-.10***	.91	-.08***	.92	.24***	1.27	.16***	1.17
	(.01)		(.01)		(.01)		(.02)	
Age Squared	-.04***	.97	-.03***	.97	-.05***	.95	-.06***	.94
	(.01)		(.01)		(.01)		(.01)	
Gender	.49***	1.63	.74***	2.10	.37***	1.45	.35***	1.42
	(.03)		(.03)		(.03)		(.04)	
Native American	.08	1.08	.38***	1.46	.00	1.00	.52**	1.68
	(.14)		(.11)		(.15)		(.16)	
Asian	-.08	.92	-.13*	.88	-.80***	.45	-.76***	.47
	(.06)		(.06)		(.08)		(.10)	
Non-Hispanic Black	-.17***	.84	.22***	1.25	-.79***	.45	-.20**	.82
	(.05)		(.04)		(.06)		(.07)	
Hispanic	.06	1.06	.28***	1.32	-.01	.99	.06	1.06
	(.05)		(.04)		(.05)		(.07)	
Socio-Economic Status	.06	1.06	.18***	1.20	.09 †	1.09	.10 †	1.12
	(.05)		(.04)		(.05)		(.07)	
Single Parent Family	.11**	1.12	.08**	1.08	.12**	1.13	.27***	1.31
	(.04)		(.03)		(.04)		(.05)	
Parental Availability/Absence	-.09***	.91	-.05***	.95	-.08***	.92	-.11***	.90
	(.01)		(.01)		(.01)		(.02)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 6, continued

Model 3

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
SCHOOL-LEVEL VARIABLES (LEVEL 2)								
Overall Intercept	-.08**	.92	-.12***	.89	-.69***	.50	-1.47***	.23
	(.03)		(.02)		(.03)		(.05)	
School-level Poverty	-.60	.55	.60 †	1.82	.10	1.11	1.04	2.83
	(.42)		(.32)		(.54)		(.76)	
School-level Ethnic and Racial Heterogeneity	.49***	1.63	.20 †	1.22	.15	1.16	.41	1.51
	(.15)		(.11)		(.19)		(.27)	
School-level Residential Mobility	.27	1.31	.53**	1.70	-.30	.74	-.18	.84
	(.28)		(.23)		(.38)		(.52)	
School-level Density	.03	1.03	-.01	.99	-.21***	.81	-.21**	.81
	(.04)		(.03)		(.05)		(.08)	
School-level Dilapidation	.10	1.11	-.04	.96	.02	1.02	-.04	.96
	(.07)		(.05)		(.09)		(.13)	
School-level Proportion Rural	-.43**	.65	-.10	.91	.01	.99	-1.00***	.37
	(.14)		(.11)		(.17)		(.25)	
School-level Proportion Urban	.06	1.06	-.10	.91	-.18	.84	-.46	.63
	(.15)		(.12)		(.21)		(.29)	
School-level Proportion Mixed Land-Use	.64	1.90	1.55*	4.71	3.54**	34.47	4.20**	66.69
	(.99)		(.78)		(1.35)		(1.89)	
School-level Proportion Single Parent	.49	1.63	.31	1.36	2.19**	8.94	2.81**	16.61
Families	(.54)		(.42)		(.69)		(.99)	
School-level Parental Availability/Absence	-.43**	.65	-.30**	.74	-.07	.93	-.57**	.57
	(.15)		(.12)		(.19)		(.27)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 7

Model 4

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
INDIVIDUAL-LEVEL VARIABLES								
Age	-.13***	.88	-.12***	.89	.17***	1.19	.10***	1.11
	(.01)		(.01)		(.01)		(.02)	
Age Squared	-.04***	.96	-.03***	.97	-.04***	.96	-.06***	.94
	(.01)		(.01)		(.01)		(.01)	
Gender	.46***	1.58	.71***	2.03	.29***	1.34	.28***	1.32
	(.03)		(.03)		(.03)		(.04)	
Native American	.10	1.11	.39***	1.48	.01	1.01	.54***	1.72
	(.14)		(.11)		(.15)		(.16)	
Asian	-.04	.96	-.09	.91	-.74***	.48	-.69***	.50
	(.07)		(.06)		(.08)		(.10)	
Non-Hispanic Black	-.14**	.87	.24***	1.27	-.72***	.49	-.12 †	.89
	(.05)		(.04)		(.06)		(.07)	
Hispanic	.09 †	1.09	.30***	1.35	.04	1.04	.12 †	1.14
	(.05)		(.04)		(.05)		(.07)	
Socio-Economic Status	.06	1.06	.17***	1.19	.09 †	1.09	.10	1.11
	(.05)		(.04)		(.05)		(.07)	
Single Parent Family	.10**	1.11	.07*	1.07	.10**	1.11	.25***	1.28
	(.04)		(.03)		(.04)		(.05)	
Parental Availability/Absence	-.08***	.92	-.04***	.96	-.06***	.94	-.10***	.91
	(.01)		(.01)		(.01)		(.02)	
Time Use	.19***	1.21	.17***	1.19	.32***	1.38	.44***	1.55
	(.02)		(.01)		(.02)		(.02)	
No Disposable Income	-.07	.93	-.02	.98	-.11*	.90	-.01	.99
	(.04)		(.04)		(.05)		(.06)	
High Disposable Income	.06	1.06	.25***	1.28	.28***	1.32	.33***	1.39
	(.04)		(.04)		(.04)		(.05)	
Respondent Drives Some Number of Miles	.14***	1.15	.12***	1.13	.33***	1.39	.25***	1.28
	(.03)		(.03)		(.04)		(.05)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 7, continued

Model 4

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
SCHOOL-LEVEL VARIABLES (LEVEL 2)								
Overall Intercept	-.10***	.91	-.14***	.87	-.75***	.47	-1.58***	.21
	(.03)		(.02)		(.03)		(.05)	
School-level Poverty	-.85*	.43	.37	1.45	-.07	.93	.69	1.99
	(.44)		(.32)		(.55)		(.74)	
School-level Ethnic and Racial Heterogeneity	.51***	1.67	.22*	1.25	.17	1.19	.49*	1.63
	(.15)		(.11)		(.19)		(.25)	
School-level Residential Mobility	.28	1.32	.44 †	1.55	-.23	.80	.31	1.36
	(.30)		(.24)		(.41)		(.55)	
School-level Density	.02	1.02	-.02	.98	-.19***	.83	-.24***	.79
	(.04)		(.03)		(.06)		(.07)	
School-level Dilapidation	.09	1.09	-.04	.96	-.01	.99	-.03	.97
	(.07)		(.05)		(.09)		(.12)	
School-level Proportion Rural	-.26 †	.77	.01	1.01	.13	1.14	-.64*	.53
	(.16)		(.12)		(.19)		(.26)	
School-level Proportion Urban	.14	1.15	-.12	.87	-.15	.86	-.44	.64
	(.16)		(.12)		(.21)		(.28)	
School-level Proportion Mixed Land-Use	.35	1.42	1.66*	5.26	3.47**	32.14	4.83**	125.21
	(1.01)		(.76)		(1.36)		(1.81)	
School-level Proportion Single Parent Families	.63	1.88	.37	1.45	2.31***	10.07	3.01**	20.29
	(.54)		(.41)		(.70)		(.94)	
School-level Parental Availability/Absence	-.28 †	.76	-.17	.84	.02	1.02	-.45	.64
	(.16)		(.12)		(.21)		(.28)	
School-level Time Use	.13	1.14	.25*	1.28	.38 †	1.46	.99***	2.69
	(.17)		(.12)		(.21)		(.29)	
School Proportion No Disposable Income	-.69	.50	.30	1.35	-.18	.84	-.44	.64
	(.47)		(.34)		(.56)		(.78)	
School Proportion High Disposable Income	.46	1.58	.71	2.03	-.47	.63	-1.74	.18
	(.70)		(.55)		(.86)		(1.17)	
Respondent Drives Some Number of Miles	-.44 †	.64	-.33 †	.72	-.20	.82	-.83 †	.44
	(.26)		(.20)		(.33)		(.45)	

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 8

Contextual Interactions

CONTEXT INTERACTIONS	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
Interactions Tested: Coefficients only if significant	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
Aggregate Time Use * Rural	-1.09* (.56)	.34	-.84* (.40)	.43				
Aggregate Time Use * Urban	1.30* (.58)	3.67	1.16** (.41)	3.19				
Aggregate Time Use * Mixed Land Use								
Aggregate Family Structure * Rural			1.40 † (.75)	4.06	2.51* (1.28)	12.31		
Aggregate Family Structure * Urban								
Aggregate Family Structure * Mixed Land Use								
Aggregate Parental Availability * Rural								
Aggregate Parental Availability * Urban			-.69* (.36)	.50				
Aggregate Parental Availability * Mixed Land Use								
Aggregate Family Structure * Dilapidation								
Aggregate Family Structure * Density					-1.03*** (.28)	.36		
Aggregate Parental Availability * Dilapidation	.45 † (.28)	1.57			.60 † (.34)	1.82		
Aggregate Parental Availability * Density								
Poverty * Mobility	5.65** (1.80)	284.29						
Poverty * Racial & Ethnic Heterogeneity	2.43* (1.10)	11.36						
Racial & Ethnic Heterogeneity * Mobility								

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 9

Cross-Level Interactions

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
Interactions Tested: Coefficients only if significant	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
Individual Time Use * Rural								
Individual Time Use * Urban	.10 † (.05)	1.11						
Individual Time Use * Mixed Land Use	.67* (.32)	1.95						
Individual Family Structure * Rural								
Individual Family Structure * Urban					-.24 † (.12)	.79		
Individual Family Structure * Mixed Land Use					1.52* (.74)	4.57		
Individual Parental Availability * Rural								
Individual Parental Availability * Urban								
Individual Parental Availability * Mixed Land Use								
Individual Family Structure * Dilapidation							-.22* (.09)	.80
Individual Family Structure * Density					-.08* (.03)	.92		
Individual Parental Availability * Dilapidation								
Individual Parental Availability * Density								
Individual Time Use * Aggregate Time Use								

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 10

Individual-Level Interactions

	PROPERTY		PERSON		ALCOHOL USE		MARIJUANA USE	
Interactions Tested: Coefficients only if significant	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)	Coeff (Std. Err.)	Exp (Coeff)
Individual Time Use * Gender					-.09** (.03)	.92	-.09 † (.05)	.91
Individual Time Use * Drives some number of miles			.07** (.03)	1.07				
Individual Time Use * No Disposable Income	.09* (.04)	1.09						
Individual Time Use * High Disposable Income								

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Table 11

Mediating Effects of Time Use

DEPENDENT VARIABLE	MODEL WITHOUT TIME USE				MODEL WITH TIME USE			
	Family Structure	Exp Coeff	Parental Avail.	Exp Coeff	Family Structure	Exp Coeff	Parental Avail.	Exp Coeff
Property Crime	.113**	1.12	-.085***	0.92	.103**	1.11	-.081***	0.92
Person Delinquency	.078**	1.08	-.043***	0.96	.068**	1.07	-.040***	0.96
Heavy Alcohol Use	.120**	1.13	-.070***	0.93	.098*	1.10	-.062***	0.94
Marijuana Use	.272***	1.31	-.108***	0.90	.244***	1.28	-.100***	0.90

*** p<=.001; ** p< =.01; * p< =.05; † p<=.10

Figure 1

Contextual Interaction: Contextual Time Use by Rural Land Use on Property Crime

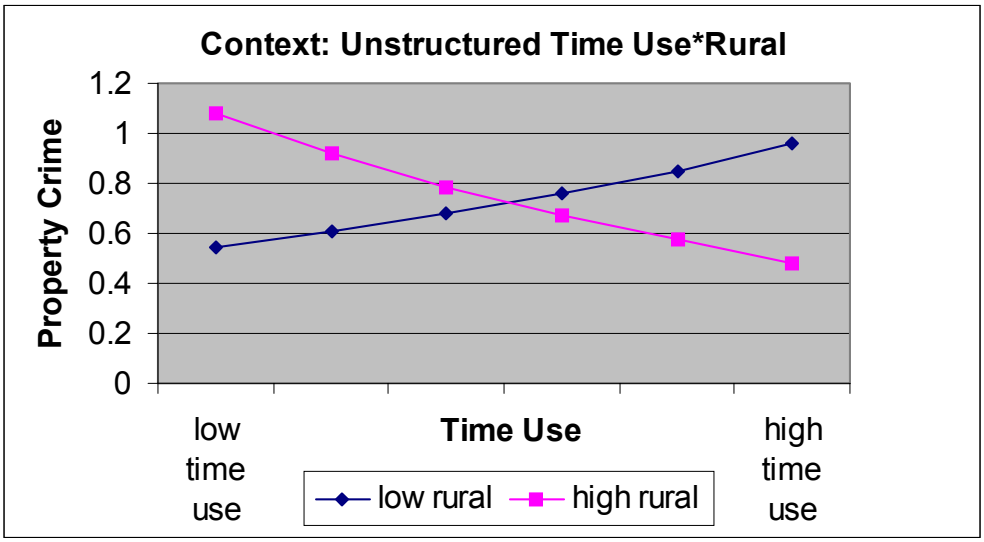


Figure 2

Contextual Interaction: Contextual Time Use by Rural Land Use on Person Delinquency

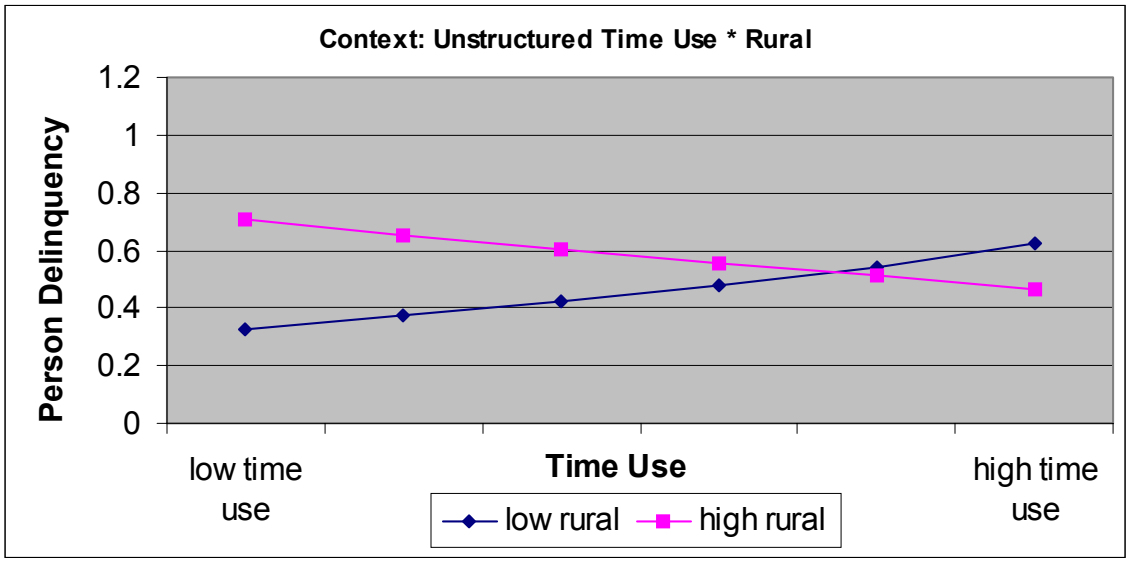


Figure 3

Contextual Interaction: Contextual Time Use by Urban Land Use on Property Crime

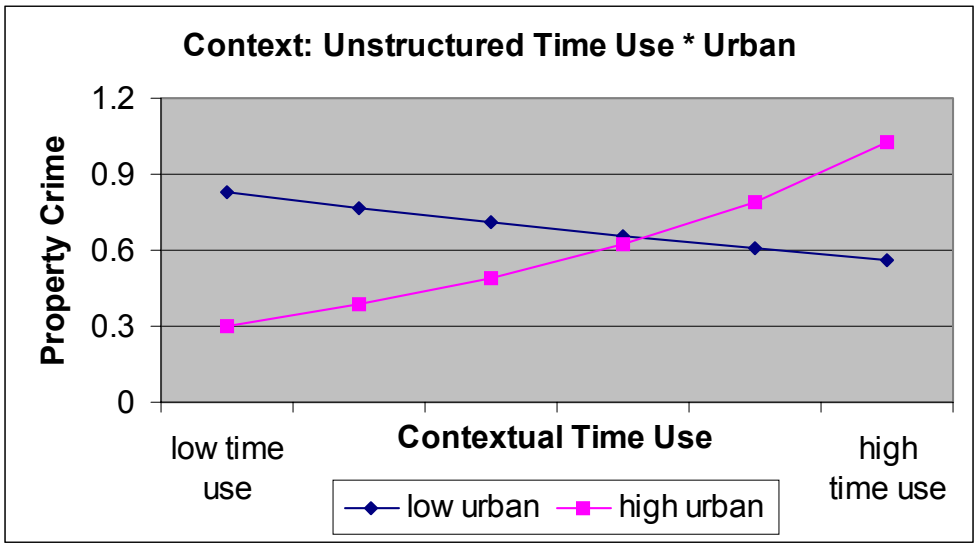


Figure 4

Contextual Interaction: Contextual Time Use by Urban Land Use on Person Crime

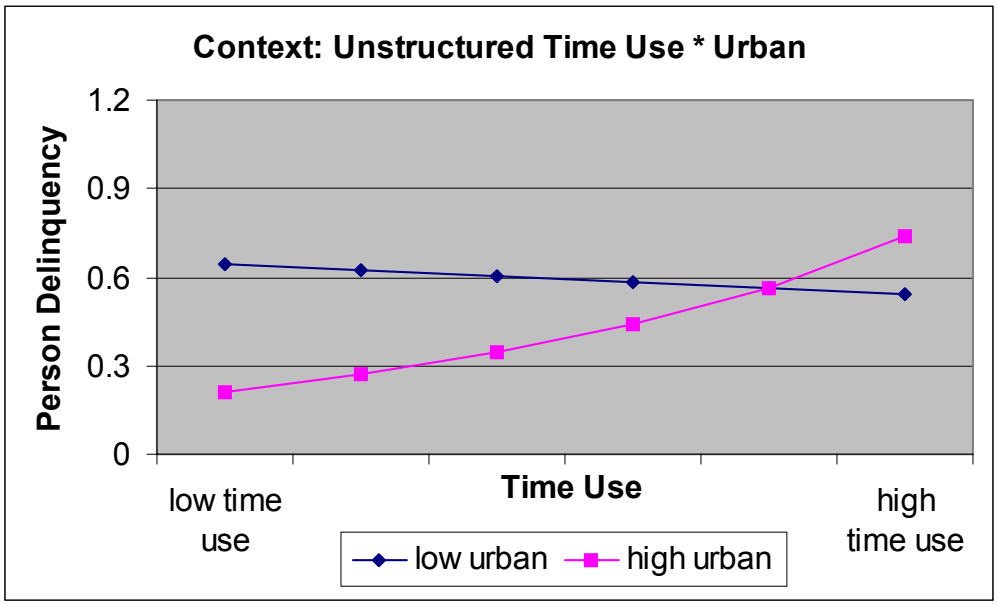


Figure 5

Contextual Interaction: Contextual Family Structure by Rural Land Use on Heavy Alcohol Use

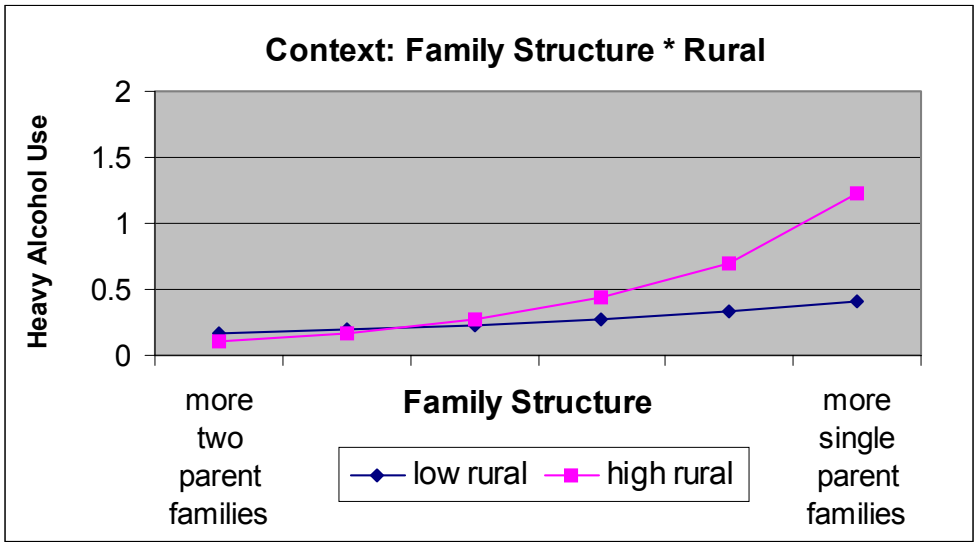


Figure 6

Contextual Interaction: Contextual Parental Availability by Urban Land Use on Person Delinquency

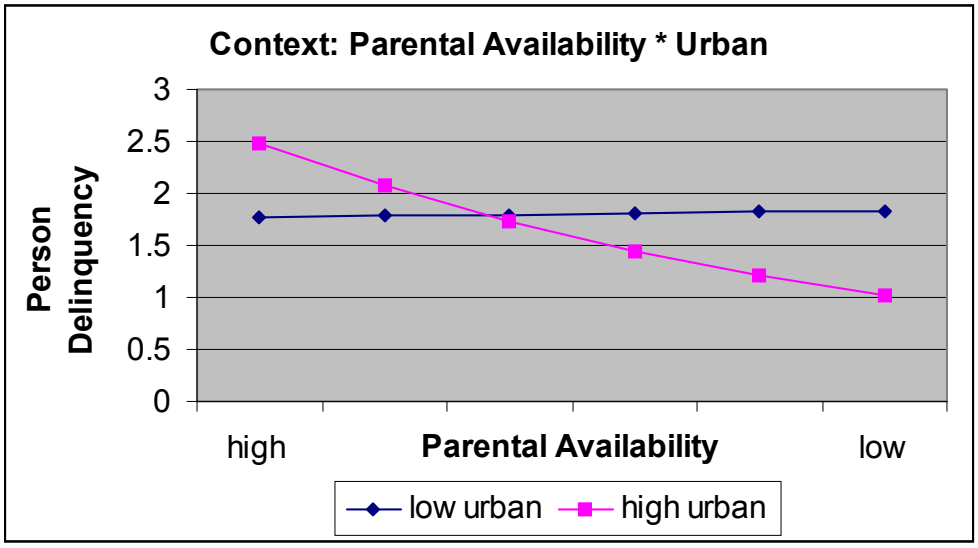


Figure 7

Contextual Interaction: Contextual Family Structure by Density on Heavy Alcohol Use

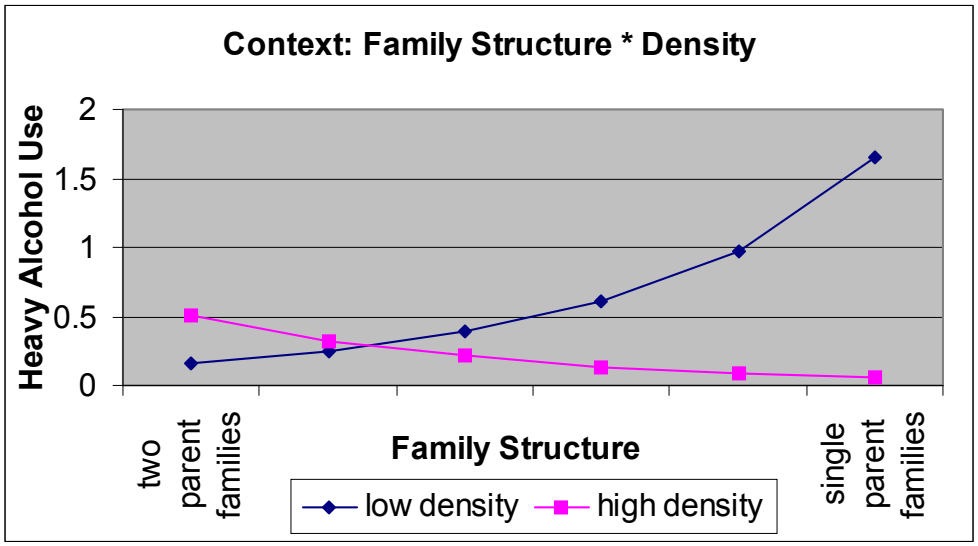


Figure 8

Contextual Interaction: Contextual Poverty by Mobility on Property Crime

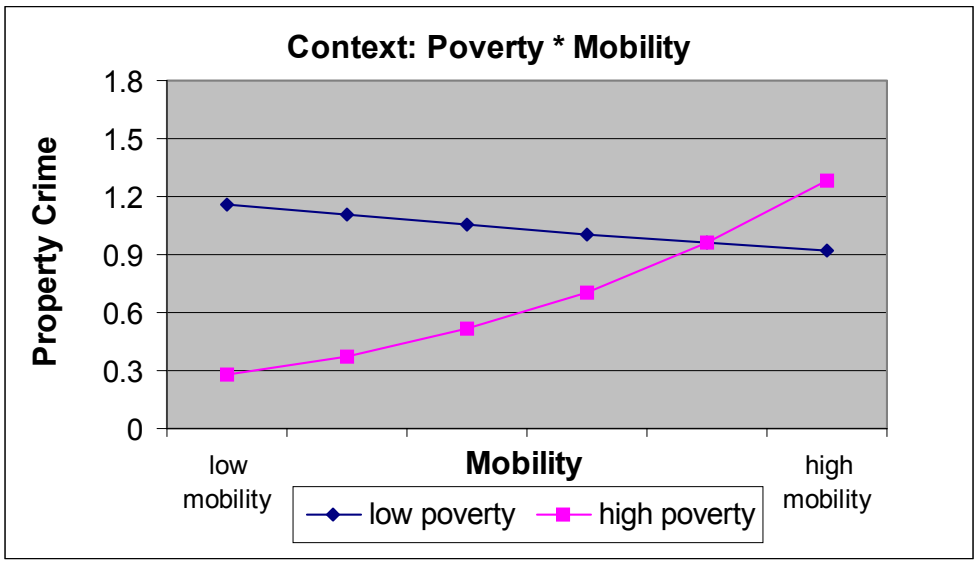


Figure 9

Contextual Interaction: Contextual Poverty by Heterogeneity on Property Crime

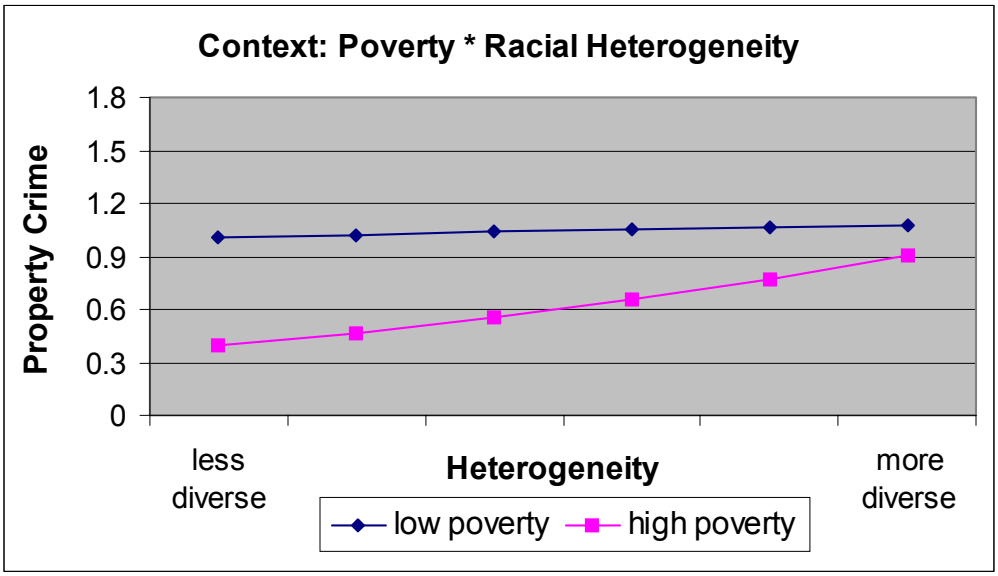


Figure 10

Cross-Level Interaction: Individual Time Use by Mixed Land Use on Property Crime

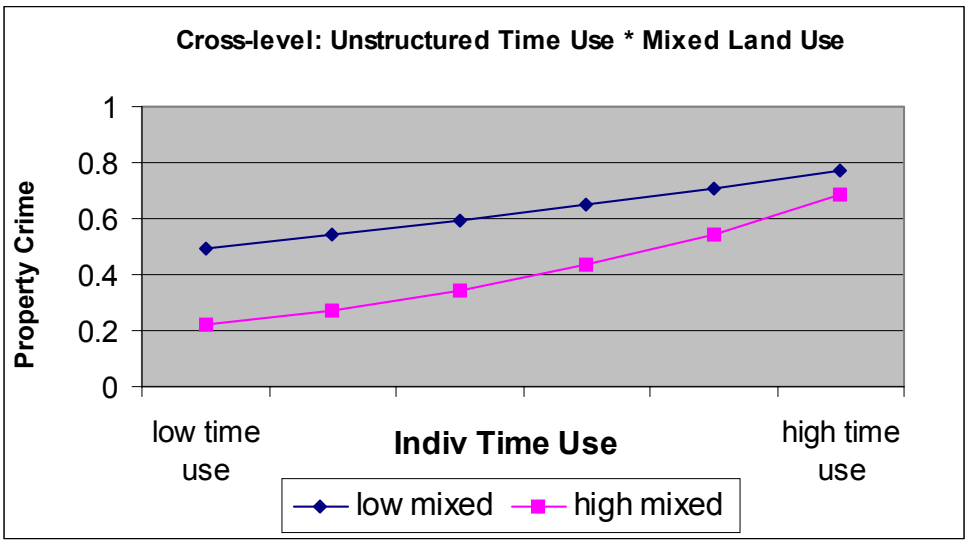


Figure 11

Cross-Level Interaction: Individual Family Structure by Mixed Land Use on Heavy Alcohol Use

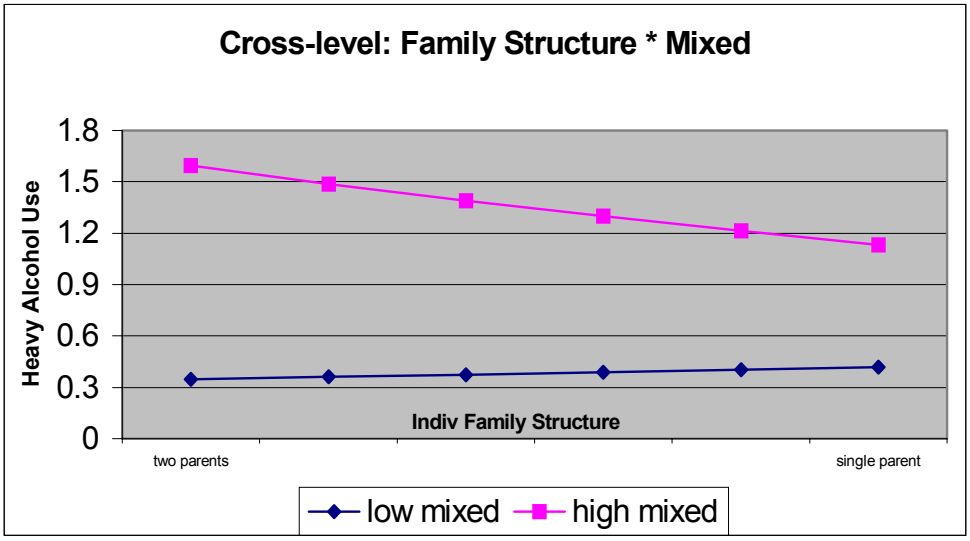


Figure 12

Cross-Level Interaction: Individual Family Structure by Density on Heavy Alcohol Use

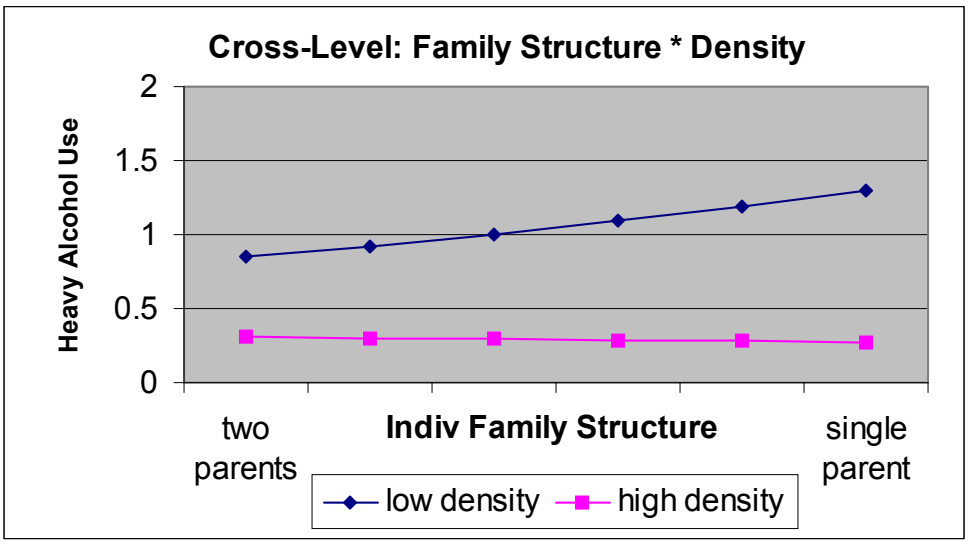


Figure 13

Cross-Level Interaction: Individual Family Structure by Dilapidation on Marijuana Use

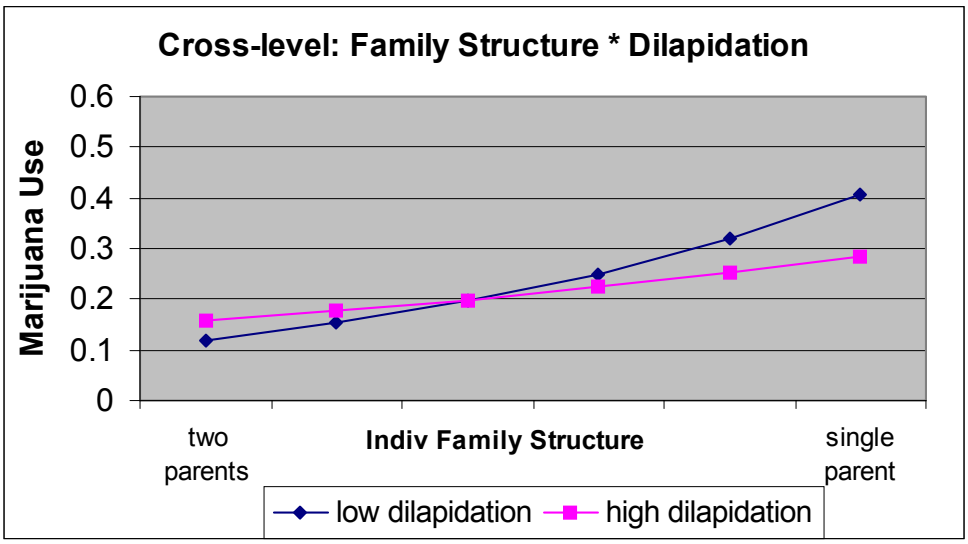


Figure 14

Individual-Level Interaction: Unstructured Time Use by No Disposable Income on Property Crime

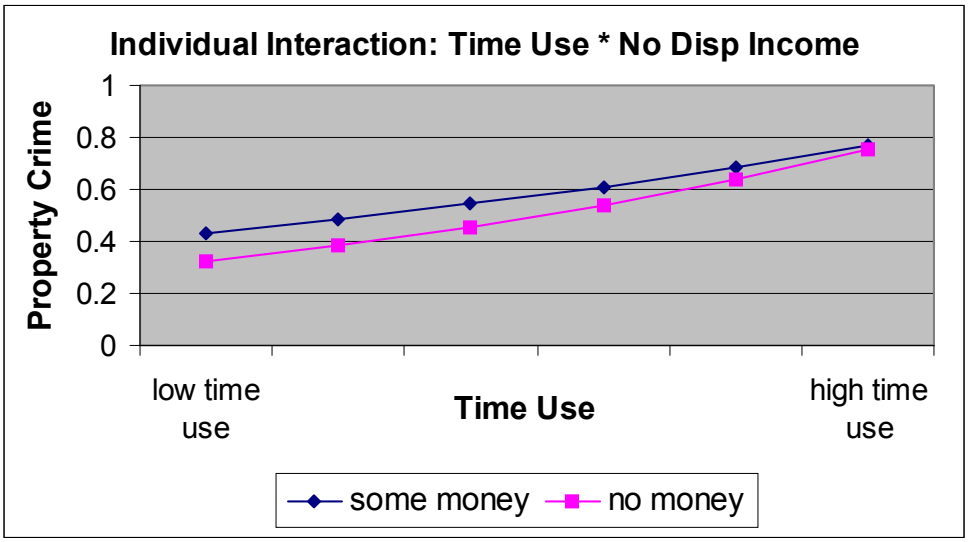


Figure 15

Individual-Level Interaction: Unstructured Time Use by Drives Some Number of Miles on Person Delinquency

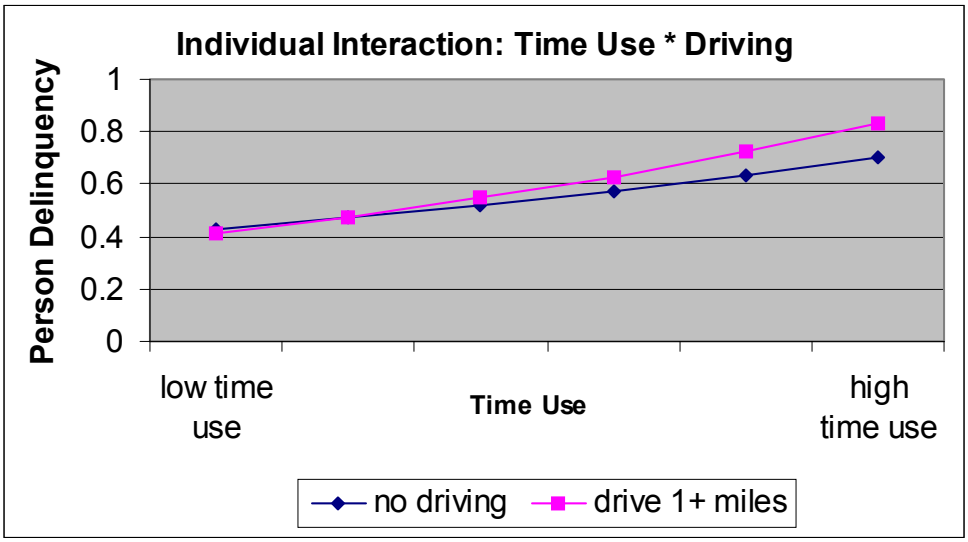
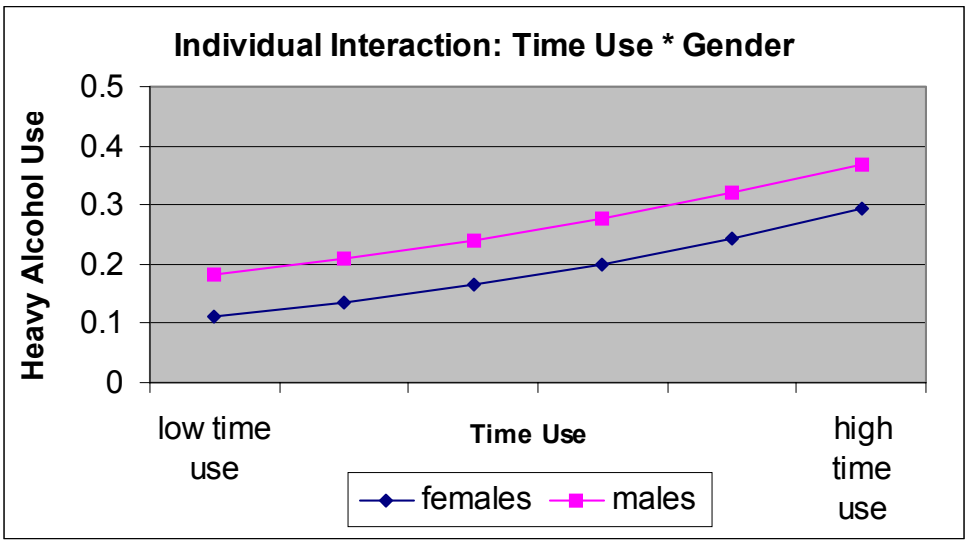


Figure 16

Individual-Level Interaction: Unstructured Time Use by Gender on Heavy Alcohol Use



Chapter 4: Discussion and Conclusion

This dissertation used the criminal event perspective and opportunity characteristics to describe factors associated with an increased risk for juvenile delinquency. In particular, this research examined environmental and individual effects on four forms of delinquency. Opportunity factors were derived from an aggregate and an individual-level routine activity theory, social disorganization theory, and notions of place.

This dissertation extended previous research in several important ways. First, the current dissertation improves on past research by examining several new individual opportunity characteristics that generally are not included in studies of delinquency. These characteristics, access to disposable income, access to private transportation, and unstructured time use, are consistent with the logic of this dissertation and routine activity theory, yet these measures are not widely included in criminological research. Importantly, these additional opportunity factors were significant predictors of all types of delinquency used in the empirical analyses.

Another interesting aspect of this dissertation was the use of the school context as important for determining contextual effects on delinquency. There were large differences between school means in delinquency as well as some large contextual effects, both pointing to the role of the school context in delinquency. The contextual effects proved to be robust in explaining the large differences between school means in delinquency, with the exception of heavy alcohol use. The contextual effects that had large effects on delinquency included the school-level proportion of youth that lived in single parent families, the school-level proportion of youth that lived in mixed-land use residential areas, and the school-level average amount of time spent in unstructured socializing with peers.

Finally, this dissertation also examined how opportunities come together, or interact, to increase the likelihood of a criminal event. That is, this research explicitly examined the joint impact of multiple factors in addition to the main effect of each factor separately. There was mixed support for a few of the tested interactions. For example, there was support for the interactions proposed by Shaw and McKay (1942) within the context of social disorganization theory. In particular, high residential mobility and high poverty combine to significantly increase property crime, as do high racial and ethnic heterogeneity and high poverty. On the other hand, there was only mixed support for the idea that the school-level physical characteristics of the residential environment are particularly relevant once opportunity characteristics are introduced. In fact, there was evidence that the opportunity factors were more proximal sources of delinquency while the physical characteristics were more distal. This is consistent with ideas presented by Meier and his colleagues (Meier, Kennedy, and Sacco 2001b).

Broadly speaking, many of the hypothesized contextual effects on delinquency were supported, however, there were some exceptions. For instance, the characteristics of land use showed a surprising pattern. Three variables representing land use (rural, urban, and mixed) and the relationship to delinquency was sometimes in the opposite direction expected. Rural land use had an unexpected positive relationship with heavy alcohol use. More surprisingly, the urban effect on person (violent) crime and both substance use measures was negative, suggesting that as the proportion of youth within the school that lived in urban areas increased, the risk of these forms of delinquency was reduced relative to schools with a high proportion of youth from suburban areas.

The school-level contextual effect of family structure was large across models and dependent variables. The contextual effect of family structure only partially supports previous

findings by Anderson (2002), who found a negative context effect on property delinquency and a positive context effect on person delinquency. The results of this dissertation, however, showed a positive effect on property crime. Anderson's (2002) previous research did not include parental monitoring as was done in this dissertation. It may be that parental monitoring mediates the relationship between family structure and delinquency. This is worth exploring in future contextual or multi-level research.

Finally, the school-level effect of neighborhood density was in the opposite direction of the hypothesis for three of the four delinquency measures (all but property crime). This suggests that increased density decreases the risk for person delinquency and both forms of substance use. These offenses are most likely deterred if there are a considerable number of people around (relative to property crime), and perhaps the housing density of a neighborhood can serve that function. Indeed, results from the interaction effects support the notion that school-level neighborhood density serves to decrease some forms of delinquency.

The effects of individual opportunity factors generally were in the predicted direction with the exception of access to disposable income. Specifically, for all forms of delinquency there was a positive relationship with unstructured time use, access to transportation, and single parent families and a negative relationship with parental monitoring, all of which were expected. There was an unexpected pattern of relationships, however, with the two variables representing access to disposable income (no disposable income and the top 15% of disposable income earners) and delinquency. In particular, those youth who did not have a disposable income were less likely to engage in all forms of delinquency compared with those youth who had some disposable income. Consistent with earlier hypotheses, those youth in the top 15% of disposable income earners were more likely to engage in all forms of delinquency than other youth.

There was mixed support for some of the interactions examined (contextual, cross-level, and individual), and modest support for the mediating effect of unstructured time use. The interactions that were tested here examined whether the presence of physical environmental characteristics that increase the opportunities for delinquency mattered more when particular family characteristics were present (single parent families and low monitoring). Overall, the conditional contextual effects were more significantly related to property and person crime than the substance use measures, especially marijuana use. There was a positive interaction effect for unstructured time use and urban land use on both property and person crime, but no effect on either substance use measure. Similarly, there was a negative interaction effect for unstructured time use and rural land use on both property and person crime, but no effect on either substance use measure. None of the contextual conditional effects mattered for explaining marijuana use, while some of the interactions that included family characteristics were significantly related to alcohol use, the other substance use measure.

As predicted by previous research, there was a positive interaction effect of the social disorganization factors. In particular, the interaction of poverty and mobility and poverty and racial and ethnic heterogeneity both had a positive significant interaction in relation only to property offending. This supports previous research by Smith and Jarjoura (1988), who argued for the conditioning effect of poverty on both mobility and heterogeneity. The authors found a large and significant interaction effect of poverty and mobility, which is replicated here.

For the cross-level interactions that were examined, none mattered for explaining person delinquency. There were more significant cross-level interactions for heavy alcohol use than any other offense, including the other substance use measure of marijuana use. In particular, several significant interactions that included family structure and a few school-level physical

characteristics of the residential environment were significantly related to both forms of substance use. The strongest of these relationships was the interaction between an adolescent's family structure and school-level neighborhood mixed-land use on heavy alcohol use. A graph of the relationship (Figure 11) indicated that youth that attended schools where many youth lived in mixed-land use areas and lived with both parents were at the highest risk for heavy alcohol use. It is surprising that those in intact families were at higher risk. Perhaps having two parents in the home somehow increases the availability of alcohol, which then increases the risk for heavy alcohol use. Also unexpectedly, there were stronger relationships in the lower categories of the school-level physical land use characteristics of residential environments than in the higher categories of these characteristics. For example, the effect an adolescent's family structure on both substance use measures was strongest in schools where a high proportion of youth lived in areas with low levels of the residential physical characteristics of density and dilapidation.

Finally, there was only sparse support for the individual-level interactions. The unstructured time use measure was interacted with gender and the other opportunity characteristics. There was some support that unstructured time use mattered less for those without a disposable income, those who do not drive, and for females. The effect of unstructured time use did not substantially mediate any of the family effects.

There are several limitations of this dissertation. The first two are related to the measurement of two independent variables. One is the unstructured time use variable, where there was no way of determining whether the adolescents were unsupervised. The question asked the adolescent how many days during the average week he or she spent with friends and not doing anything in particular. This wording does not allow for any determination of supervision and, although it is assumed in this dissertation to be unsupervised, there could be indirect

monitoring taking place. Additionally, this measure is a single item with a limited response range. The time use variable then is considered a conservative estimate of the actual effect of time use. The second potentially problematic measure was the residential mobility measure, which did not capture any information about the distance moved. That is, an adolescent could have moved within neighborhood or school, but the effect presented in this dissertation is based on whether the adolescent moved at all regardless of how far the adolescent moved. Though these variables were still effective in explaining delinquency, future research should have more precise measurement of these opportunity factors. Finally, the data used in this dissertation are cross-sectional. This creates some problems because the independent variables do not necessarily precede the dependent variables. Future research should determine whether these effects become weaker, stronger, or stay the same using longitudinal data.

CONCLUSION

This dissertation began with the assumption that opportunity is crucial to a delinquent event. Accordingly, this dissertation sought to pull together factors that differentially affect the opportunity for an event to happen. Routine activity theory, a contextual theory of opportunity, also points to guardianship as important in creating opportunity. In fact, at the aggregate level, a decrease in guardianship increases opportunities. With this general framework, a set of contextual and a set of individual characteristics were extrapolated from relevant criminological literature. These factors all are consistent with the themes of opportunity and guardianship.

The opportunity characteristics broadly into the following categories: residential environment, social context, family, and personal or individual characteristics. The school is the context used in the analyses. The residential characteristics of the places youth lived were

aggregated to the school, and represent the pool of places, and by extension the opportunities that any one adolescent may have access to through the other students in the school. I will return to this point in a moment.

In the process of selecting opportunity factors consistent with variants of routine activity theory, two factors were selected that have been mentioned or implied in delinquency literature (but see, Felson 2002), and another that has been sporadically empirically examined (see Osgood, Anderson, and Shaffer 2004 for review). The two newly tested individual-level characteristics are access to disposable income and access to an automobile. In this dissertation, these characteristics are viewed as important ingredients for substance use, particularly because both heavy alcohol use and marijuana use almost necessarily require one if not both of these "opportunities" in order to obtain the substance in the first place. That is, a youth may need to pay for and/or get to the substance before being able to use it. If an adolescent is not purchasing the substance himself or herself, but plan to share with others (e.g., marijuana use), then it is likely that a youth will need transportation in order to use the substance. This may be less true with alcohol, which is likely to be found in the home. In other words, substances illegal for adults as well as juveniles are likely to cost money and require transportation to obtain (and unstructured time use for that matter). Indeed, the results of this dissertation support this allegation, with some of the largest individual-level effects found for adolescents with high disposable income and adolescents who drive more than one mile.

Additionally, unstructured time use was included as an opportunity factor, both as an individual-level and contextual factor. Unstructured time use is not included in many studies of delinquency (but see Osgood, Anderson, and Shaffer 2004), yet proved to be a valuable predictor of juvenile delinquency. In fact, not only was the individual-level effect for unstructured time use

(the more time a youth spends with friends not doing anything in particular) positively and significantly related to juvenile delinquency, but so was the contextual effect. That is, the more time that all youth within a school spent in this activity, the more at risk for delinquency every youth in the school was regardless of any one adolescents' unstructured time use. This points to the possibility of place-specific policy because all youth within a school are at risk due to the emergent effect from the characteristics of each adolescent, in this case, unstructured time use. This contextual effect is consistent with previous findings by Osgood and Anderson (2001), and is worth exploring further in future research.

Finally, the broad idea in this dissertation was that youth attending the same school potentially have access to the opportunities of other youth in the school. I see two ways, however, that access to opportunities through peer contexts and peer activities affect an adolescent's risk for delinquency. The first way is at a general level, which is what is examined in this dissertation. In particular, you can be delinquent with people who are just acquaintances, such as peers from school, and not necessarily just with friends. This idea is consistent with, for example, Thrasher's (1927) ideas about the spontaneity of gangs and Reiss's (1986) ideas about co-offending. The second way that peer activities and context may matter is more specific to an adolescent's friends. This avenue needs to be examined in future research. Specifically, it may be that potential access to peer contexts through all students in the school (what is tested here) increases the risk of delinquency for all students in the school regardless of any one adolescent's friends. It is also possible, however, only the contexts of an adolescent's close friends matters. Future research should determine whether the focus should be restricted to specific friend networks and friend contexts, or whether the larger school context is more appropriate.

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