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Employment, Crime, and Context: A Multi-Level Analysis of the Relationship Between Work and Crime

by

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Abstract

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This dissertation examines the influence of work on criminal behavior. It stems from the perspective that work, at both the individual and community level, can shape attitudes, influence behavior and structure lifestyles. In this research, I examine whether industrial composition, labor market opportunities, and employment experiences, at both the macro and micro levels, can play an important role in affecting crime.

I draw on U.S. Census Data, the Uniform Crime Reports, and individual level data from the National Longitudinal Survey of Youth to examine how industrial and labor market characteristics of areas can influence aggregate rates of crime and how the employment experiences of individuals can effect individual levels of participation in criminal behavior. This multi-level approach allows for the examination of individual and contextual-level causal mechanisms in the employment/crime relationship.

At the aggregate level this research goes beyond much of the current literature by treating industrial composition, not labor force participation as the exogenous variable in aggregate models of work and crime. Industrial composition is shown to influence labor force participation, social organization, and residential segregation. All of these factors influence crime rates. This approach begins to address the role of labor market stratification, as well as de-industrialization in understanding the relationship between work and crime.

At the individual-level I use subjective indicators of job quality to determine whether investments in employment can deter individuals from criminal behavior. The findings suggest an interpretation of the relationship between work and crime that is supportive of the age-graded social control theory proposed by Sampson and Laub (1990). The results also suggest that the industrial and labor market contexts of counties have a significant effect on individual criminal behavior above and beyond the influence of individual employment. Collectively, these findings offer strong support to the labor market stratification and crime perspective. This approach combines social control theory, social disorganization theory, and the routine activities and crime perspective to understand the role of individuals and communities in the relationship between work and crime.

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Over the last five years or so I have occasionally dreamed of this point in time. Not only finishing my dissertation, but taking the time to formally thank those whose mentorship, friendship, and humor has made these six years both possible and enjoyable. Without their encouragement, advice, and presence my graduate school career would have been much different, and a lot worse. Unfortunately, my dissertation is due in an hour and a half and I am exhausted. My dreams of waxing wonderful and humorous prose about all the folks who have touched my life are being dashed against the rocky shores of a rapidly approaching deadline. So, I will get to the point.

First, I want to express my deep appreciation to the members of my committee. Professor Paul LePore, Professor Ross Matsueda, Professor Jerry Herting, and Professor George Bridges have all helped in ways too numerous to mention. While George has been a little safer as his office is guarded by numerous administrative assistants, Paul and Ross have been victim to many disturbances as I popped in to ask if they "had a minute." I learned quickly that there is no such thing as a minute long conversation with Ross. He would inevitably point to some interesting theoretical or statistical point that we would then discuss for awhile. If I can remember half of what I learned in these discussions, I will be twice the sociologist.

Paul's guidance has come in many packages. He is the eleventh grade English composition teacher I never had and my favorite social psychologist to debate. Both the lessons and the debates have made my dissertation a better piece of work. I recruited Jerry Herting late in the game (mostly out of guilt that I was using so much of someone's time who was not even

officially on my committee). His ability to talk statistics in a language I understand has been amazing. His attitude and willingness to share his knowledge are an inspiration.

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Ahh, forty-seven minutes to go until the graduate school closes for the quarter.....

Chapter 1: Introduction

This dissertation examines the influence of work on criminal behavior. It stems from the perspective that work, at both the individual and community level, can shape attitudes, influence behavior and structure lifestyles. In this research, I examine whether industrial composition, labor market opportunities, and employment experiences, at both the macro and micro levels, can play an important role in affecting crime.

At the macro level I ask which economic, industrial, and labor market characteristics at the community level are correlated with higher levels of violent and property crime? This structural approach, which finds its roots in the Chicago School and analyses of the effects of neighborhood context, builds on and tests the assumption that the economic health and labor market structure of a community can have both direct and indirect effects on criminal behavior. While many studies have examined how poverty and unemployment at the macro level influence rates of crime (Gillespie 1978; Blau and Blau 1982; Cantor and Land 1985; Chiricos 1986; Sampson 1987), far fewer have addressed the influence of industrial and labor market activity on crime rates beyond the effects of unemployment (see Bellair 2000; Crutchfield 1989; and Allan and Steffensmeier 1987 for exceptions). In this research, I conceptualize industrial composition and other county characteristics as exogenous variables that influence patterns of labor force involvement and social organization. It is hypothesized that these patterns as well as the variables that influence them will affect rates of crime.

At the micro level, I pose the question of whether individuals involved in the labor force and with certain job characteristics are any more or less likely to participate in violent or property crime than individuals with different employment circumstances. For instance, will unemployed individuals participate in crime at different levels than those who are employed or in school?

After holding income, education, and other important background and socio-economic variables constant, will factors such as the presence of promotional opportunities, job security, fringe benefits, or a pleasant working environment have any influence on the degree to which an individual is involved in violent or property crime? If there is evidence suggesting that such characteristics make a difference we can deepen our understanding of how the stratification of labor markets and the effects this process has on employment characteristics can influence participation in criminal behavior.

Exploring the relationships between work and crime at both the individual and community levels greatly enhances our ability to examine the causal mechanisms that relate the two concepts. When using only aggregate-level analyses to build theoretical models of the relationship between work and crime it is very difficult to test the causal processes. Most research that has looked at the influence of community characteristics on criminal behavior has also used aggregate rates of crime as the dependent variables (Blau and Blau 1982; Cantor and Land 1985; Chiricos 1986; Sampson 1987). This makes it extremely difficult to determine whether relationships are driven by individual-level processes aggregated up to the community level, or by contextual-level processes that occur independent of or in conjunction with individual characteristics. The assumption that an aggregate relationship is caused by a causal process at the individual level can lead to the ecological fallacy. For instance, evidence that cities with high levels of unemployment also have high levels of crime does not necessarily mean that the unemployed individuals are driving up the crime rate. Aggregate unemployment may create a context in which both the employed and the unemployed (or maybe even just the employed) are committing crimes at higher rates.

Research in the area of employment and crime using individuals as the unit of analysis avoids the error of ecological fallacy, but it does not allow for consideration of the direct or

indirect influence of contextual characteristics. If unobserved contextual characteristics significantly influence the outcome variables of interest then the individual-level model is mis-specified and will be estimated with considerable bias. The exclusion of community characteristics also makes it impossible to determine whether some structural conditions will strengthen or weaken individual-level relationships.

In the present work, both the individual and the community are used as units of analysis. First they are examined separately, then simultaneously. The focus on community industrial and labor market characteristics links this research with the large body of aggregate-level research on employment and crime. Yet, it also expands the focus to include community characteristics that precede labor force involvement and economic well-being such as industrial composition. Macro-characteristics such as this have received little attention in studies of work and crime.

Examining individual-level employment experiences and characteristics offers a more thorough understanding of how work at the individual level influences criminal behavior. Treating community and individual characteristics simultaneously as important predictors of criminal behavior permits the parceling out of the individual and contextual effects through which labor markets influence crime. This examination highlights the problem of the ecological fallacy and offers more valid support to proposed causal mechanisms at both the individual and community level.

The inclusion of industrial composition and labor market context in an examination of individual criminal behavior is especially relevant at a time in which the U.S. economy is rapidly moving away from centralized production and manufacturing, and towards a labor market dominated by information technology and service sector employment. Some have suggested that while these macro-economic shifts in patterns of production have driven down wages, weakened unions, and increased levels of economic inequality and stratification across the U.S., these shifts

have been especially detrimental to the health and well-being of communities in which manufacturing and extractive based industries were heavily concentrated (Wilson 1989, 1996).

The term "underclass" was introduced in the social sciences as scholars began to focus on the causes and consequences of pushing concentrated segments of urban populations towards the fringes of the labor market, one result of de-industrialization. One of the characteristics of the underclass that has received much attention is the high rate of participation in criminal behavior, especially violent crime, among individuals living in these areas characterized by unemployment, poverty, and high levels of social disorganization (Wilson 1989, 1996; Krivo and Peterson 1996; Crutchfield, Glusker , and Bridges 1999). While focusing on individual-level characteristics alone can tell us a fair amount about the causal process by which economic or employment factors can lead to participation in crime, introducing contextual-level information enhances the potential for greater explanation.

These issues concerning the effects of job characteristics and area context on criminal behavior are of sociological and criminological importance in their own right. However my final question is, perhaps, the most intriguing in that it examines the influence of macro economic factors on individual-level processes. I ask whether the economic, industrial, labor market and racial context of an area influence the individual-level relationship between a person's employment experience and their participation in criminal behavior. Will the individual relationship between employment characteristics and crime be stronger in a community with especially high or low levels of unemployment, or amidst a labor market dominated by certain types of industry, or in an area with certain patterns of racial composition? This type of analysis can be thought of as "slopes as outcomes." The dependent variable of interest, thought to be a product of contextual factors, is the slope of the individual relationship.

Nesting the individual-level relationship between work and crime within the larger economic and labor market context offers further insight into the causal mechanisms generating this relationship by specifying under what conditions it is more or less likely to exist. While the inclusion of economic and labor market context in this multi-level analysis follows the logical progression laid out by the first two questions, I also include indicators of racial composition and segregation in the analyses. I have added these variables to the inquiry to explore the effects that segregation (and the absence of employment networks that often accompany it) may have on the individual-level relationship between work and crime. These characteristics have been identified as key factors in our attempts to understand the consequences of shifts in the labor market (Wilson 1996; Massey and Denton 1993; Shihadeh and Ousley 1998) and the resulting concentrations of urban, often minority, poverty and joblessness.

This dissertation examines work and crime in several ways that have only begun to be explored in the current literature. First, at both the macro and micro levels, this study moves beyond viewing work as a dichotomous variable (employment vs. unemployment) when considering its potential relationship with crime. Instead, both work statuses and characteristics of jobs at the micro level, and industrial and labor market composition at the macro level, are viewed as factors that may be related to criminal behavior. The move toward a more multi-dimensional conceptualization of employment, at both the individual and aggregate level, was first suggested in the late 1980's (Crutchield 1989; Allan and Steffensmeier 1987) and has been further developed over the last fifteen years (Crutchfield and Pitchford 1997; Crutchfield, Glusker, and Bridges 1999; Uggen 1999; Wadsworth 2000). This dissertation further extends this approach to conceptualizing employment.

Both Crutchfield (1989) and Allan and Steffensmeier (1987) used occupational codings to classify the proportion of the population working in primary vs. secondary sector jobs.

Crutchfield and Pitchford (1997) and Uggen (1999) used a similar approach to classify survey respondents at the individual leve. Wadsworth (2000) used self-report information concerning employment patterns and types of compensation received by employees. My dissertation advances the instrumentation of this improved conceptualization of work at the individual level by using subjective indicators of specific job characteristics. It is these job characteristics that comprise important aspects of the day to day experiences of individuals employed in various occupations and sectors of the labor market.

Second, I explore how macro-level factors, such as industrial composition and labor market context can influence individual adult criminal behavior, both directly and through their impact on an individual's labor market experiences. While contextual factors related to labor market and economic characteristics have been used in previous work to explain aggregate crime rates (Allan and Steffensmeier 1987; Crutchfield 1987), they have only begun to be used to examine individual participation in crime (Crutchfield and Pitchford 1997; Bellair 2000). This dissertation expands on some of these initial efforts to explore the role of context on individual-level work and crime.

Finally, while much of the literature has focused on either the micro *or* macro-level processes by which work effects crime, this research uses multi-level modeling techniques to explore more precisely how the individual-level relationship between employment characteristics and criminal behavior varies across economic, labor market, and racial contexts. In other words, how will characteristics representing the industrial, economic, and racial context of a community, such as industrial composition, labor force participation patterns, and levels of segregation affect the relationship between an individual's work experience and his/her participation in criminal behavior?

Work and Crime: Theoretical Considerations and Empirical Conclusions

Taking a broader theoretical view, these issues address the larger question of how macro-economic structure and community organization, working through individual employment opportunities and experiences, affect crime at the individual and aggregate levels. The question concerning the economics/work/crime relationship has been approached from a variety of theoretical and empirical directions. Some have attempted to combine macro and micro components, but most have focused on one level of explanation. Looking at the strengths and weaknesses of some of these approaches, as well as their potential for extension, suggest both the need for further theoretical development and empirical assessment and points to a potentially fruitful direction for such work.

Research in the area of employment and crime has emerged from two fairly distinct intellectual realms, economics and sociology. While there is certainly some crossover between the two fields, advocates of each often view the work of those in the other discipline with some concern. Economists often argue that sociologists utilize sophomoric quantitative methodology to explore the complex relationship between employment and crime (DiIlulio 1996), while sociologists claim that the strictly utilitarian models proposed by economists become overly simplistic when they disregard non-economic influences and assume complete rationality. Despite these differences, scholars from both fields have contributed greatly to the development of a base of knowledge in the area.

The Role of Motivation

In 1968, Gary Becker published a seminal article entitled "Crime and Punishment: An Economic Approach." While no empirical analysis was offered, Becker suggested that the decision to engage in crime should be modeled like any other career decision. This approach,

expounded on by Ehrlich (1973) proposed that individuals make decisions concerning illegitimate and legitimate employment opportunities based on the relative attractiveness of their options. If legitimate opportunities become more attractive (the availability of better paid or more enjoyable jobs) and/or illegitimate opportunities become less attractive (lower profits, increased risk, more severe punishments, etc), or the other way around, an individual may shift their focus from one to the other. This theoretical approach to the causal mechanism explaining how employment influences crime has dominated much of the econometric research in the area of work and crime.[1] While the focus of economic choice theories is primarily on the individual actor and the decisions that they make, economic and industrial context at the macro level can play a role in the theory by framing the potential choices and opportunities from which an individual may choose. These provide indicators both of what an individual could earn legitimately, as well as opportunity costs if the actor chooses illicit employment.

While intuitively appealing for its simplicity, this model's basis in economic rationality limits its explanatory value to understanding decisions to participate in income generating crimes.[2] This leaves out the large percentage of criminal behavior in the U.S. that may be viewed as more expressive rather than instrumental. However, this type of rational choice model in which an individual balances their time and energy based on the available opportunities allows for both movement back and forth between legitimate and illicit work and for the simultaneous participation in both activities. This type of adaptation involving somewhat fluid movement between the spheres of work and crime is consistent with prior empirical research (Bushway and Reuter 1997; Sullivan 1994).

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[1] The other stream of research in economics focusing on work and crime has explored the effect of crime on future employment, and labor market success. Some have argued (Pirog-Good 1986; Good at al 1986; Fagan and Freeman 1999) for the need to model the processes by which unemployment increases crime and crime increases unemployment as simultaneous, allowing for reciprocal effects.

[2] There have been rational choice models proposed to explain violent crime, but these models tend to focus more on formal sanctions as deterrents and less on informal social controls.

Many sociologists accept the assumption that individuals weigh the costs and benefits of criminal behavior but argue that non-economic factors are often considered as part of the decision making process. With this in mind, some researchers have moved toward using a less strict conception of rational choice theory to explain the link between employment and crime. In discussing the salience of adult social bonds, Sampson and Laub (1990) draw on Hirschi's (1969) social control theory to talk about the role that job stability can play in the development of commitment to conventional behavior. While this approach does not view the decision to participate in illegal activity as a strict economic calculation, it does suggest that an evaluation of the relative rewards (more broadly defined than in many of the economic models) of different types of activities is central to the decision making process.

Sampson and Laub's age-graded social control theory (Sampson and Laub 1990) suggests that rewards from employment, and the investment in conventional lines of behavior that such rewards encourage, may create "stakes to conformity" (Toby 1957) that deter individuals from committing crimes. If employment offers few rewards, than investment in conventional lines of behavior will be limited and bonds to conforming behavior will be weak or non-existent. If this is the case, employment will not serve as a deterrent to criminal behavior. Social control theory, as outlined by Hirschi (1969) was primarily interested in the deterrent effect of opportunity costs or what might be lost by participating in crime. Drawing from the economic models of rational choice, it may also be useful to consider what might be gained from criminal activity. Adding this to social control models allows for the consideration of both opportunity costs and opportunity profits.

With this addition, and allowing psychic returns and emotional currency to be included in the model, a social control model of how employment influences criminal behavior would certainly fall within the realm of rational choice theory. By including both different indicators of

employment and different types of crime, my dissertation examines the degree to which any individual-level relationship between employment and crime can be explained by strictly economic factors. This will hopefully offer some insight into the debate between strict economic choice theories and less bounded versions of rational choice.

Like traditional economic choice theories, social control theory focuses on the individual-level process by which one makes a decision whether to participate in criminal behavior. Also like economic choice theories, by allowing context to frame the opportunity and reward structure in which this individual-level process occurs, we are able to connect macro-economic factors with individual behavior. In sum, those who have fewer opportunities to participate in rewarding employment (the result of macro-level opportunity structures) will be less likely to develop stakes or investments in career related lines of activity. The opportunities that influence the development of investments may be based on accurate or inaccurate perceptions of labor market prospects. It is worth noting that while macro-economic factors may create the framework for the decision making process, rational choice models, both the traditional economic models and a less restrictive social control perspective are based entirely on individual-level causal processes.

Traditional social disorganization theory (Shaw and McKay 1929) and its more recent developments (Stark 1987; Sampson and Groves 1989) present an ecological approach to understanding aggregate rates of criminal behavior. Shaw and McKay (1929) suggested that industrial development and immigration patterns weakened institutions of informal social control in urban areas. These macro-economic shifts and the community characteristics they generate help shape the context in which individual decisions are made. So in addition to explaining aggregate rates of crime, these approaches can be used to understand the context in which individual criminal behavior is taking place.

High levels of community instability weakens the social ties that bond individuals to their neighbors and neighborhood institutions (churches, school associations, community organizations, etc). Weak ties lower the costs associated with criminal behavior and leave individuals freer to deviate. It is also likely that higher rates of disorganization will lead to higher aggregate rates of crime. This increases the likelihood of individuals participating in crime by providing ample accomplices, mentors, and role models.

Shaw and McKay (1929) pointed to industrial development and immigration patterns as the beginning of the process of social disorganization. I would argue that de-industrialization and migration may encourage a similar process. While the inter-generational neighborhood succession that they wrote about may not take place, the concentration of low-wage unstable jobs is apt to be detrimental to family stability, neighborhood cohesion, and the development of community institutions. All of these factors create a context that is more conducive to crime by decreasing the costs associated with deviant behavior. These factors may influence an individual in conjunction with or irregardless of their own employment experience.

The Role of Opportunity

The routine activities and crime perspective (Cohen and Felson 1979) suggests a number of potential relationships between employment and crime. This perspective focuses more on opportunities to offend than motivations for offending. It proposes that employment influences the way people spend their money and their time, as well as altering the spatial distribution of human activity. Unemployment may actually decrease levels of crimes such as burglary by reducing the number of houses left unoccupied during the day (Witte and Long 1986). Yet it can at the same time increase the number of violent crimes by allowing more people to spend time in potentially "criminogenic situations," such as hanging out on street-corners, in arcades, bars, etc.

(Crutchfield 1987). Such gatherings bring together motivated offenders with potential accomplices, targets, and victims. In addition to unemployment, other labor market characteristics such as part-time employment, day-laboring, temporary lay offs, and job commitment can have similar effects in that they influence how, where, and with whom individuals spend their time.

From a routine activities and crime perspective, unemployment, characteristics of jobs, and employment patterns are all potential influences on criminal behavior. The mechanisms by which these influences occur include changing the availability of targets, creating concentrations of marginally employed or unemployed individuals, and increasing the amount of unstructured social interaction. The routine activities and crime perspective points to macro or contextual-level processes that relate employment to crime. As in the discussion of social disorganization theory, the influence these macro employment factors related to criminal opportunities have on individuals are not necessarily conditional on the individuals' specific employment situation.

Empirical Research

While there has been no shortage of theoretical development in the work/crime arena, consistent empirical evidence for the different causal mechanisms proposed in the theories has been less abundant. The body of empirical work can be broken into two major groups, studies drawing on aggregate data and studies focusing on individual-level data.

Aggregate level

Throughout the 1970s and much of the 1980s, there existed what Chricos (1987) referred to as a "consensus of doubt" concerning the relationship between unemployment rates and crime rates at the aggregate level. Chiricos argued that this was primarily the result of a misreading of the research in the literature and a lack of attention paid to the conditional nature of the

relationship. He suggested that while the work of Gillespie (1978), Long and Witte (1981), and Freeman (1983) supported the existence of a relationship, these works, and others, had often been misinterpreted as offering only weak and insignificant findings. He reported results from a meta-analysis drawing on sixty-three studies that explored the relationship between unemployment and property crime. His findings suggest that this relationship is usually positive, often significant, and is more likely to be found in studies that include 1970s data (in which there were large increases in both unemployment and crime), focus on property crimes, and utilize smaller levels of aggregation.

The finding that significant positive relationships are identified more consistently in studies that utilize data aggregated at lower levels stems from the heterogeneous nature of larger areas such as states and in some cases, metropolitan areas. In larger, more stratified and diverse areas, some particular communities may not be as affected by general economic conditions. An economic upswing driven by the technological sector, that increases the economic well being of a county or SMSA, may not increase the employment opportunities for low skilled workers living in the inner city. The work of Box (1987), Land, McCall and Cohen (1990), along with Reilly and Witt's Great Britain study (1996), and Kohfield and Sprague's (1988) study of crime and unemployment rates in St. Louis census tracts, all add further support to Chiricos's findings that suggest both a significant relationship between unemployment and crime, and the conditional nature of this relationship.

Some researchers have suggested that looking at general measures of unemployment can be somewhat misleading (Shihadeh and Ousley 1998; Allan and Steffensmeier 1989). While unemployment has often been used as an overall economic measure, it tells us little about what types of jobs are available or who is likely to fill them. As most crime is committed by adolescents and young adults (Hirschi and Gottfredson 1983), it is the job opportunities available

to individuals in these age brackets that should drive any potential relationship between employment and crime.

In a study of one hundred metropolitan areas in the United States, Shihadeh and Ousley (1998) found an inverse relationship between the availability of jobs requiring minimal skill and experience and rates of violent crime.[3] This finding adds more support to the conditional nature of the aggregate-level relationship between employment and crime. It suggests that while smaller more homogenous geographical areas may be especially susceptible to labor market influences, certain population sectors (in this case, low-skilled workers) may also be more heavily influenced by macro-economic factors.

Allan and Steffensmeier's research (1989) found that property crime rates for young adults (differentiated from adolescents) tended to be unaffected by the availability of low wage jobs, but were significantly decreased by the availability of higher quality jobs, which require more skill and offer better compensation. Property crime rates for adolescents, on the other hand, were inversely related to the availability of lower quality jobs.

Their focus on different age structures and types of crime makes it difficult to compare these two studies, yet their contrasts suggest some important distinctions in the study of work and crime. First, at the aggregate level, labor market processes may have varying effects on property versus violent crime. Second, different indicators of labor market opportunity may have different effects on criminal behavior. Third, there may be interactions between types of crime, age structures and types of employment opportunity.

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[3] "Low-Skilled" jobs are measured as the proportion of all jobs located in industrial sectors dominated by low-skilled employment. This is based on Kasarda's work (1993). Out of the seventeen major industries identified in the Standard Industrial Classification the following ten are dominated by low skill jobs: [Agriculture, Forestry and Fisheries], [Mining], [Construction], [Nondurable Manufacturing], [Durable Manufacturing], [Transportation], [Wholesale Trade], [Retail Trade], [Personal Services], and [Entertainment and Recreational Services].

One of the difficulties of integrating the theoretical and empirical work aimed at addressing the unemployment and crime relationship at the macro level is that few of the aggregate studies offer indicators that specifically measure the causal mechanisms. Claims concerning the causal process therefore are based more on assumptions and interpretations of general findings than on empirically testable processes. As no individual-level controls are usually included in the statistical models, the ecological fallacy prevents us from being able to confidently use aggregate-level research to support individual-level processes. However, the empirical evidence that suggests a relationship between unemployment and crime at the aggregate level could be claimed as support for almost any theory that suggests a contextual-level mechanism. Chiricos's work, for example, suggesting that evidence for the relationship is somewhat more consistent for property crime than for violent crime, could be claimed as support for the inclusion of economic rationality as a central aspect of the causal mechanism.

Theories suggesting the role of social disorganization, or the spatial distribution of human activity are bolstered by the empirical findings that found a relationship between limited employment opportunity and violent as well as property crime. The work of Allan and Steffensmeier (1989) and Shihadeh and Ousley (1998) suggests the importance of broadening our focus beyond just looking at gross unemployment rates. By disaggregating the offenders by age and the unemployment or employment rates by occupational sector, we can see that the types of jobs that are available influence participation in crime differently across the age structure. While not offering specific support to any one causal explanation, these findings suggest that jobs vary in deterring illegal behavior, and that a more multi-dimensional conceptualization of work, and a more complex approach to understanding how it affects crime, is warranted.

Individual level

While less abundant, research at the individual level has been more successful in exploring the causal process through its conceptualization of employment and its inclusion of other important individual and demographic characteristics. Free of the risk of ecological fallacy, sociologists and economists using survey data from both the general population and selected samples (usually high-risk populations) have been able to test not just the relationship, but the mediating forces by which it occurs. The use of individual-level data has allowed important clarifications and the development of conditional propositions. However, it has also added challenges to empirical research.

The issue of causal direction, a concern rarely discussed in the aggregate-level research (see Staley 1987 for exception), has confounded examinations of the employment and crime relationship. Economists have tended to be most interested in addressing the effect that criminal behavior can have on labor market success, while sociologists have focused more on how labor market participation can influence criminal involvement. While a negative relationship between crime and employment has been found fairly consistently (Sampson and Laub 1993, Good, Pirog-Good and Sickles 1986, Thornberry and Christenson 1984), there are few longitudinal data sets available with small enough time units to precisely determine the appropriate chronology of events.

Arguing that both the theoretical and empirical work in the etiological study of crime had ignored the possibility of reciprocal effects, Thornberry and Christenson (1984) used a structural equation model to examine the reciprocal effects of work and crime among respondents from the 1945 Philadelphia Birth Cohort. They found that employment status influenced criminal behavior, which in turn influenced employment status. Adding further support to this claim, Good et al. (1986) and Pirog-Good (1986) used simultaneous probit equations to examine the

relationship between employment and police contacts among a group of youth involved in an at-risk program in Philadelphia. They also found support for reciprocal inverse effects between being employed and participating in criminal behavior.

In drawing on Granovetter's (1985) usage of "embeddedness" to understand labor market participation, Hagan (1993) discusses how criminal behavior can create barriers to successful employment experiences, and can in turn increase the likelihood of continued involvement in crime. In a review of the literature, Fagan and Freeman (1999) noted a fair amount of evidence for reciprocal effects in the crime and employment relationship. In exploring the first part of this relationship in which labor market participation can influence criminal behavior, researchers have conceptualized employment in a variety of ways. The manner of conceptualizing the labor market process is often directly connected to the proposed theoretical mechanism.

In a study of young adults in the National Longitudinal Survey of Youth, Grogger (1998) found that wages were inversely related to participation in criminal behavior for young adults. He suggested that this, in part, could explain the discrepancy in official crime statistics between whites and minorities. Minorities commit more crimes because they have lower wages. Good et al. (1986) and Pirog-Good (1986) both found that participating in work in a given thirty day period had an inverse effect on having an official contact with the police during that period. Grogger, Good et al., and Pirog-Good's findings were used to support a rational choice "crime as work substitution" explanation of the work/crime relationship.

In working with the Gluek's sample of 1000 men from Boston (Gluek and Gluek 1950), Sampson and Laub (1990) conceptualized employment as a type of investment, or an informal social control. They found that continuity of employment, indicated by tenure with a single employer, had an inverse effect on both property and violent crime. Following this conceptualization of employment, Crutchfield and Pitchford (1997) found that young adults in the

NLSY who had more consistent employment histories were less likely to participate in violent criminal behavior. Witte and Tauchen (1994) followed a more economic approach in hypothesizing that work may deter crime by providing legitimate financial rewards. Their finding that the influence of school and work participation were identical suggests a causal mechanism that goes beyond immediate economic rationality and is more supportive of the perspective that views work as an informal social control. Uggen's work (1999) that focuses on a crime-prone sub-sample of the general population offers additional support to a conceptualization of work that moves beyond financial compensation. Researching respondents of the National Supported Work Demonstration he found that job quality had a greater deterrent influence on criminal behavior than income or educational attainment.

This brief review of the theoretical and empirical developments in the area of work and crime suggests a number of important points. First, at the individual and macro level, work represents more than just a paycheck. To focus solely on the economic costs and benefits of crime may severely restrict our ability to understand the relationship between work and crime. While strict economic choice theory relegates the pros and cons of crime into an economic model, other theories that have addressed the relationship between unemployment and crime (Sampson and Laub 1990; Cohen and Felson 1987, Crutchfield 1989) propose that employment can serve a variety of functions and fill a number of different needs. At the individual level, employment can encourage the development of commitments and investments that deter deviant behavior and promote pro-social activities. Job stability and routinization can influence family formation which deters criminal behavior among young adults (Wilson 1989). It can also influence family dynamics in a manner that benefits school performance and deters adolescent delinquent behavior (Wadsworth 2000). At the aggregate level, labor markets can influence community organization

that in turn promotes informal social control and structures lifestyles in a manner that discourages delinquency.

From an empirical standpoint, if most criminal behavior is simply an alternative means of getting paid we should see no relationship between unemployment and expressive (or non-income generating) crime, and we should see stronger relationships when the conceptualization of work focuses more specifically on its economic rewards. This has not been the case. If it is true that crime is not simply a response to economic factors, our research must move towards modeling employment in a manner that captures both the economic and non-economic characteristics of an individual's or community's labor market experience that may influence participation in criminal behavior. One important way to proceed towards this discovery is to move away from viewing employment as a dichotomous variable and consider other factors of the labor market such as job characteristics and labor market composition that may influence crime.

Another suggestion emerging from this review is the importance of context in understanding individual-level criminal behavior. All of the theories either suggest or can be extended to allow for the interaction between contextual and individual-level variables in determining individual-level outcomes. While many of the aggregate-level studies include contextual-level characteristics beyond the employment rate, none allow for the connection of macro and micro-level factors. Hence we are left examining either individual actors without being able to consider contextual factors or community level relationships without knowing how they influence individuals or who makes up the crime rates. One approach to addressing this issue is to use data that embeds individuals within contexts and apply quantitative methods appropriate for observing this interaction.

The Labor Market Stratification and Crime Perspective

A theoretical and empirical approach to examining the influence of employment on crime that begins to address some of the issues raised above is the labor market stratification and crime perspective (Crutchfield 1989; Crutchfield and Pitchford 1997, Crutchfield, Glusker, and Bridges 1999; Wadsworth 2000). This approach, which serves as the theoretical backdrop for this dissertation draws on social control theory, social disorganization theory, and the routine activities and crime perspective to explain how employment may influence criminal behavior at both the community and individual level. This perspective suggests that those with low quality or intermittent employment, low income, few or no benefits or rewards, and little chance for improving their lot will have diminished investments is conventional lines of action (Crutchfield 1989; Sampson and Laub 1990; Crutchfield and Pitchford 1997; Uggen 2000). Without these forces actively discouraging deviance, individuals are more likely to engage in criminal or socially unacceptable behavior.

This approach does not portray involvement in crime as necessarily utilitarian. The route to crime probably does involve a subjective evaluation of the pros and cons of different behavioral choices. However, this evaluation includes a variety of factors such as the emotional rewards and status stemming from both work and crime. Such factors are not usually included in economic choice models. In some cases financial struggles associated with unemployment (or poor quality employment) may encourage a person to engage in profit oriented crime. Yet, it is also possible that the lack of structured activity that comes with regular employment and the personal investment associated with rewarding job characteristics can create a situation lacking the necessary informal deterrents to any type of deviant or criminal behavior, be it instrumental or expressive. In other words, it is not necessary for ones employment situation to motivate them to commit crime, only that it do little to deter it.

The labor market stratification and crime perspective suggests that while unemployment may have a direct causal relationship with crime among some individuals, both unemployment and poor quality employment can indirectly affect individual criminal behavior by decreasing levels of informal social control. Proponents of this perspective argue that marginal and unstable employment give people little incentive to avoid circumstances that are likely to lead to crime.

Through their destabilizing effects on communities and shifts in spatial distribution of human activity, unemployment and low quality employment at the community level can also influence aggregate crime rates (Auletta 1983; Duster 1987; Crutchfield 1989). Higher levels of unemployment and marginal employment encourage larger gatherings of weakly bonded individuals in public spaces such as bars, street-corners, and arcades which facilitates the meeting of motivated offenders with potential accomplices and victims.

The labor market stratification and crime thesis borrows from Dual Labor Market Theory to explain the variance in levels of employee participation and commitment. Dual Labor Market Theory proposes that within the U.S. economy there are two distinct sectors of the labor market (Piore 1975; Kalleberg and Sorenson 1979; Rosenberg 1975).[4] The primary sector is characterized by stable, well-paid jobs that tend to offer benefits, security, and opportunities for upward mobility. Primary sector jobs are more likely to be protected under collective bargaining agreements and are less vulnerable to slow-downs, layoffs, and other occupational uncertainties. Internal labor markets encourage long-term employee tenure and a sense of mutual investment.

In contrast, secondary labor markets are dominated by more short term or part-time positions, "spot work," and day laboring. These jobs tend to pay lower wages and offer few benefits and minimal opportunity for upward mobility (Gordon 1971; Andrisani 1973; Bosanquet

[4] Critics of dual labor market theory have proposed that the labor market should actually be further divided into a larger number of sectors. They considered a segmented labor market theory that included more subtle divisions to be more appropriate.

and Doeringer 1973; Rosenberg 1975). They are rarely covered under collective bargaining agreements and are characterized by a lack of occupational security.

Crutchfield (1989) argued that the segmentation of labor into primary and secondary sector jobs not only could be used to explain why some portions of populations were chronically disadvantaged in the labor market, but also why there was differential involvement in other behaviors influenced by economic well being, including crime. Explaining chronic disadvantage, especially for racial and ethnic minorities, was one of the objectives of dual labor market theorists (Doeringer and Piore 1971; Piore 1975; Kalleberg and Sorensen 1979). Marginalized groups are frequently over-represented in secondary sector jobs which are characterized by low pay, high turnover, poor benefits, and limited prospects for the future. Primary sector jobs, those well paid, good-benefits jobs where employees have a reasonable expectation of future employment and perhaps even promotion, are more open to majority group members.

As mentioned above, secondary sector jobs are unstable and poorly paid (Gordon 1971; Andrisani 1973; Bosanquet and Doeringer 1973; Rosenberg 1975). They experience frequent turnover (Rosenberg, 1975), and those employed in these types of jobs are less likely to have strong ties to coworkers or place of employment (Piore 1975; Kalleberg 1977).[5] These are not employment characteristics that bind an individual to their job, provide stakes in conformity, or cause him or her to avoid lifestyle choices that are more likely to lead to criminal behavior. Going to work the next morning for the marginally employed is not so important in the face of attractive offers to socialize with similarly employed or unemployed friends.

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[5] Crutchfield (1989) presents a brief bivariate analysis of General Social Survey (GSS) data that indicates that those in secondary sector occupations were more likely to be unemployed, to expect to lose their jobs, were less satisfied with their job than primary sector workers, and defined their jobs as less important to them than did primary sector workers. Secondary sector workers interviewed for the GSS were more likely to spend social evenings with neighborhood friends and young males in this group were more likely than their contemporaries to go to bars and taverns.

The first part of the mechanism linking work to crime is the investment or stake in conformity that comes from having a rewarding job. The second and more macro aspect of the labor market stratification and crime perspective suggests that this bonding process does not work in isolation. While having no job or a bad job may increase the likelihood of criminal involvement for some individuals, it is unlikely that this is a constant effect across all or most individuals. This process in which marginal employment leads to participation in crime is more likely to occur when the unemployed or secondary sector worker is in the proximity of similarly marginalized individuals. When an individual marginalized worker is surrounded by others in the same situation, both their negative perceptions of labor market opportunities, and the number of opportunities for criminal behavior are apt to substantially increase.

The labor market stratification and crime perspective allows individual-level factors to interact with geographic composition and structural variables. Thus, this perspective fits into a broader sociological literature that has shown the effects of labor market changes on rates of other social phenomena and measures of wellbeing (Wilson 1987, 1996; Massey and Denton 1993; Kasarda 1990). Using this perspective as the theoretical groundwork a number of studies have examined the relationship between work and crime at either the aggregate or individual level.

Crutchfield (1989) demonstrated that Seattle census tract crime rates were positively related to "labor instability," a combination of the unemployment rate and the portion of workers in secondary sector jobs in each tract. The hypothesized mechanisms connecting secondary sector employment and unemployment to individual criminal behavior were the social bonds specified in control theory (Sampson and Laub 1990). Secondary sector workers were less likely to bond to jobs that offered them little to lose, and those who were unemployed obviously had no stake in keeping a nonexistent job. It was also proposed that this individual effect would be stronger in

neighborhoods with large numbers of similarly situated individuals. Because the study used aggregate-level data, there is no way to specifically evaluate the proposed causal mechanisms.

Crutchfield, Glusker, and Bridges (1999) examined tract-level labor market and homicide data for Seattle, Washington D.C., and Detroit to further explore the mechanisms through which labor market segmentation at the aggregate level influenced violent crime rates. They found that labor market segmentation had a direct effect on homicide in Washington D.C., but not in Seattle or Detroit. However, they did find that the percentage of the population in each tract that was working in secondary sector jobs had a positive influence on the development of an underclass in Detroit and Washington D.C., and high school drop out rates in Seattle and Detroit. Both the size of the underclass and high school drop out rates were positively related to homicide rates. Again, the use of only aggregate data makes it impossible to empirically evaluate the proposed individual-level causal mechanisms.

Using data from the National Survey of Youth, Crutchfield and Pitchford (1997) found that young adults who spent time out of the labor market were more likely to commit violent crimes. This was especially true for people who lived in counties with higher than average levels of labor force non-participation by adults. The implication of these findings is that the existence of a critical mass of people who are not working or who are marginally employed has additional criminogenic effects, beyond the effect of individual employment characteristics. This research begins to address the multi-level causal process suggested by the labor market stratification and crime perspective.

This small body of literature points to a number of important points and begs a number of questions. First, these studies along with others less directly focused on labor market stratification suggest that types of employment and characteristics of jobs are important in understanding the relationship between work and crime at both the individual and community level. To

conceptualize work simply as unemployment or employment is too limiting. Exactly what these characteristics are that may be influencing criminal behavior is less clear. Both Sampson and Laub (1990) and Crutchfield and Pitchford (1997) found that job stability is an important aspect of employment. However, job stability is apt to be related to a variety of other employment characteristics that may increase the sense of investment in employment.

Second, along with the de-industrialization literature, this literature suggests that focusing on industrial composition and dominant labor market sectors may be a useful way to examine the effects of macro-level economic forces on crime rates. Modeling both the direct and indirect effects of industrial composition on both aggregate and individual-level crime has received little attention in the literature. The degree to which these potential relationships are the result of individual-level or contextual-level mechanisms has been discussed theoretically, but has not been examined empirically.

Third, examining the conditional nature of the individual relationships, and how they interact with community economic factors may tell us more about how employment influences crime at both the individual and aggregate levels. The interaction between individual and aggregate-level characteristics was explored briefly in Crutchfield and Pitchford's research (1997) which showed a stronger relationship between job instability and violent crime in areas with higher levels of unemployment and secondary sector employment. A closer examination of the link between micro and macro employment characteristics has the potential to deepen our understanding of the employment and crime relationship. This approach needs to be further developed empirically to eliminate the problems of using interaction terms and to more precisely specify the observed relationships.[6]

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[6] As will be discussed in more detail, interacting individual and aggregate variables in hierarchically sampled data sets violates the assumption of independence, one of the main assumptions of ordinary least squares regression.

New Directions for the Study of Labor Market Stratification and Crime

In recent years there has been much public debate and academic discussion about how changes in the American labor market, most notably the decline in low-skilled, blue collar jobs, has led to a host of urban problems, including crime (Auletta 1983; Knight 1994; Wilson 1987, 1996). What has not been as clear is exactly how these changes or other factors related to work affect crime. In fact, despite a large body of theoretical development and empirical investigation, our understanding of the relationship between work and crime is still quite limited. While there persists a belief among scholars, as well as many policy makers, that the economy, economic position, and in particular employment, influence crime, the mechanisms by which these variables are related have not been consistently demonstrated.

The goal of this dissertation is to deepen our understanding of the effects of employment on criminal behavior. I believe that addressing a set of questions that aim to further the theoretical development, and the empirical assessment, of the employment and crime relationship can lead us in this direction. These questions have not been thoroughly examined, or in some cases have not been examined at all. They can be framed by the labor market stratification and crime thesis (Crutchfield 1989; 1995; Crutchfield and Pitchford 1997; Wadsworth 2000). While these questions are not limited or necessarily unique to the ideas of this perspective, I find it to be a useful framework from which to build. The specific research questions are:

1. *Which economic, employment, and social organization related macro-level characteristics are associated with aggregate rates of crime?*

To what degree do county-level factors such as the industrial composition, urbanization, stability, and racial composition of the community influence county crime rates? Are these

influences direct or are they mediated by labor force participation patterns? Are the effects similar across different types of criminal behavior? What causal mechanisms explain these relationships? Are these operating at the individual or contextual level?

2. *What are the individual-level occupational characteristics associated with involvement in crime?*

Exactly how employment is conceptualized is of utmost importance when considering its relationship to criminal behavior. As will be discussed in more detail in Chapter 4, I am suggesting that the use of indicators measuring both employment status and subjectively evaluated employment characteristics is the most appropriate method for conceptualizing the multi-dimensional aspects of employment. Therefore, the first important question is which of these occupational characteristics are useful in understanding the effect that work may have on crime? While economists have focused on wages, and sociologists have looked at occupational categories, in addition to employment status, my dissertation examines the influence of specific characteristics that represent the day-to-day experience of employment. These characteristics may be influential in their own right, or their importance may be in their ability to act as indicators of higher vs. lower quality jobs.

3. *Does individual labor market experience mediate the relationship between macro-level characteristics and individual-level participation in crime?*

If the potential effects discussed in question one exist, are they direct effects or are they mediated by the individual's employment experience? For instance, if the industrial composition, or labor force involvement of a community influences individual respondent's criminality, is this

relationship independent of, or dependent on, the patterns and characteristics of the respondent's employment?

4. *Does the relationship between an individual's labor market experience and his/her involvement in crime vary across community contexts? If so, can economic, labor market, and racial characteristics of areas explain this variance?*

If, in fact, a relationship exists between individuals' labor market experiences and their participation in crime, the question is begged as to whether or not this relationship is constant? If, on the other hand, it varies across different communities or contexts can the factors discussed in question one explain this variation? Is the relationship between employment experience and crime aggravated, or mitigated, by the economic, labor market, or racial characteristics of the community in which the respondent lives?

To address these questions, I employ secondary data analysis of both publicly available individual and aggregate-level data, and restricted individual-level data. The data sources include the National Longitudinal Survey of Youth, The 1980 Census of Housing and Population, and the Uniform Crime Reports. The analytical strategy is governed by two distinguishing characteristics of the research. First, I take advantage of the rich detail on employment history, employment characteristics, and criminal behavior in the 1979 and 1980 waves of the NLSY. In doing so, I am able to move beyond the simplified models that have been used in much of the previous research by employing multiple indicator models to measure key concepts such as perceived opportunities for advancement, stability of employment, working conditions, fringe benefits, and other characteristics. Second, this research links aggregate community analyses with individual or micro-level analyses. By using the restricted geo-coded data that can be appended to the

individual NLSY respondents, I am able to examine how the labor market, economic and racial context of counties affect individual behavior. This is a link which has been absent from much of the empirical work on employment and crime (see Bellair and Roscigno 2000 for exception). In addition to using more appropriately aggregated data than has often been used in previous research, by drawing on multi-level statistical procedures that have not previously been applied to this area of inquiry, I am able to estimate the effects of both individual and contextual-level variables on crime. At the same time, I can examine how contextual effects influence individual-level relationships. This analysis can be conceptualized as nesting employment characteristics within local economic contexts to see how they affect criminal behavior.

Overview

This chapter has introduced the central research questions I will examine in my dissertation and discussed their relevance to the further development of theories of employment and crime. In *Chapter 2: Data and Methods*, I will describe in more detail the three data sets used in the dissertation (The National Longitudinal Survey of Youth, The U.S. Housing and Population Census, and Federal Bureau of Investigation Uniform Crime Reports). I will also address briefly the statistical approaches I will use to estimate the aggregate, individual and multi-level models. *Chapter 3: Industrial Context, Labor Markets and Opportunity Structures*, focuses on how the industrial composition and economic context of an area will influence patterns of labor market participation, social organization, and racial segregation. The relationships between these variables and rates of criminal behavior at the aggregate level will be examined. Before presenting the analyses, I discuss in more detail the theoretical linkages between these macro characteristics and crime.

After describing the conceptualization of the employment variables, *Chapter 4: Job Characteristics, Investments, and Participation in Crime,* presents an individual-level analysis examining the relationship between employment, job characteristics and participation in criminal behavior. In addition to testing some of the theoretical arguments presented in Chapter 1, this analysis examines whether specific characteristics of individuals' jobs affect their participation in criminal behavior. These findings shed light on the causal mechanism driving aggregate-level relationships as well as those identified with individual-level data. *Chapter 5: Nested Models of Work and Crime,* starts with a brief discussion of the logic behind the use of hierarchical linear models to examine contextual effects. I then present an analysis using HLM to explore whether the work and crime relationship demonstrated in Chapter 3 can be explained by individual or contextual-level causal mechanisms. I am able to determine whether the individual-level relationships identified in Chapter 4 vary across different economic, industrial, and racial contexts and whether, after holding individual characteristics constant, contextual-level variables effect individual's criminal behavior. By nesting the employment characteristics/crime relationship within the economic and industrial context, we are able to identify how the macro-structural characteristics of the labor market may have additional indirect effects on criminal behavior. In *Chapter 6: Conclusion,* I discuss the theoretical significance of the findings from these analyses for the substantive area of work and crime, and more broadly, the study of economics and crime. I conclude with a discussion of potentially fruitful future avenues of research that may deepen our understanding of the relationship between work and crime.

Chapter 2: Data and Methods

Data

Much of the research in the area of work and crime has used either aggregate-level data to make conclusions about the effect of labor market variables on crime rates (Allan and Steffensmeier 1989; Crutchfield 1989), or individual-level data to examine the effects of employment on individual criminal behavior (Uggen 1999; Sampson and Laub 1993; for an exception see Crutchfield and Pitchford 1997). In this dissertation I use both individual self-report data and aggregate county-level data to examine the effects of macro-level forces on aggregate crime rates, and the effects of both macro and individual-level forces on individual criminal behavior.

The NLSY

The individual-level data come from the 1979 National Longitudinal Survey of Youth. The NLSY79 is a longitudinal survey that has been following a sample of 12,686 males and females, who were between the ages of 14 and 21 in the initial year of the survey (1979). The respondents were interviewed every year up to 1996. The NLSY79 sample consists of three independent probability samples; a cross-sectional sample representative of the national population (N=6,111), a supplemental sample that over-sampled black, Hispanic, and economically disadvantaged non-black, non-Hispanic youth, (N=5295), and a military sample (N=1280). As the focus of the dissertation is on adult crime, I have only included respondents who were eighteen or older in the first wave of data collection.

The Sample

The cross-section sample comes from 204 Primary Sampling Units (PSU's). These units are composed of SMSA's, counties, parts of counties, and independent cities. Census division, SMSA vs. non-SMSA, county size, and percentage black were used as stratification criteria in the first stage of the selection. Proportional probabilities were generated based on the 1970 Census population. Block groups (where census blocks had been designated) and enumeration districts (in areas that had not been blocked) were used as the secondary units of selection. Whenever possible these block groups were subdivided into segments before dwelling unit listings were created. Screening interviews were scheduled for 22,077 dwelling units (households or independent quarters). Initial screening located a total of 6,922 eligible youth.

The supplemental sample was designed to collect a sample of three youth cohorts of interest (i.e. Hispanics, non-Hispanic blacks, and non-Hispanic non-black economically disadvantaged). Primary sampling units consisted of counties and independent cities. A selection procedure was used to generate 100 primary sampling units with appropriate proportions of the target cohorts. The process discussed above used in the cross-section sample was followed. Screening interviews were carried out in 55,737 households and individual quarters. The screening process created a supplemental sample of 6.855.

There were 657,549 members of the active military between the ages of 17 and 21 as of September 30, 1978. A stratified, two-stage, clustered sampling procedure drawing on lists supplied by the Army, Navy, Airforce and Marines was used to create the military sample. To

provide samples large enough for separate estimates by sex, females to males were sample at a ratio of 6:1. This process generated a sample of 823 males and 457 females.[1]

Features of the NLSY79

Several features of the NLSY79 make it appropriate for addressing the questions at hand. The objective of the study was to obtain detailed personal and work histories of the respondents as they entered and proceeded through the labor force. Using this data I am able to include in the analysis measures of labor market participation, income, work characteristics such as job security, promotional opportunities, benefits, etc., educational experiences and achievements, previous delinquent behavior, and other relevant background characteristics. In the second wave of data collection (1980), respondents were asked about their criminal behavior. This set of questions included indicators of involvement in robbery, assault, threatening, fighting, vandalism, car theft, larceny, shoplifting, burglary and fencing. Unfortunately, questions about criminal involvement were not included in the subsequent years. So, while I would prefer more recent data, and the opportunity to perform longitudinal analyses, these analyses will be cross-sectional in nature using lagged employment variables to address time-order issues. This approach will be discussed in more detail in Chapter 4.

Another feature of the NLSY79 is that respondents are matched with "geo-coded data." The city and county in which each respondent lives is coded so that county and city-level census data can be matched to the individuals. This allows us to explore the macro forces that may affect work or crime. These confidential data can be used after the appropriate permission is received

[1] For more detail on the sampling procedures used in the NLSY, see the NLSY79 Technical Sampling Report (1983) & Addendum 1996, published by the National Longitudinal Survey User Services.

from the Bureau of Labor Statistics, the governmental organization that oversees the administration of the NLSY.

Aggregate Data

To explore the effects of economic, labor market and racial context on employment characteristics and criminal behavior I draw on two publicly available data sets, the 1980 Census of Housing and Population, and the 1981 Uniform Crime Reports. I appended the data from these sources to the individual respondents in the NLSY79. In most of the models only counties represented by at least one NLSY respondent are included in the analyses. However, descriptive statistics are given for the population of counties and comparisons are made between the population and the sample of counties used.

The 1980 Census of Housing and Population provides information concerning the demographic, industrial, economic, and labor market characteristics of the counties in which the NLSY79 respondents are living. The data in the census is provided as raw numbers. In most cases these numbers were converted to percentages. The Uniform Crime Reports indicate the number of crimes reported to the police in each county. They include property crimes (burglary, larceny, auto theft, and arson) and violent crimes (murder, rape, aggravated assault, and robbery). Together these data sets supply a very detailed picture of both employment and crime in the counties in which the survey respondents are living.

Methods

Three major analytical tools will be used in these analyses, ordinary least squares regression (OLS), factor analysis, and hierarchical linear modeling (HLM). OLS is used in Chapters 3 and 4 to estimate the effects of aggregate and individual-level characteristics on rates

of crime and individual participation in crime respectively. Before these models are estimated some indicators are combined using principal components factor analysis. This process serves to create more powerful measures of underlying constructs of interest, and minimize issues of collinearity by including highly related indicators in one factor.

HLM is used in Chapter 5 to examine the possibility of contextual effects in models of employment and crime. This technique allows for consideration of the effects of individual characteristics along with characteristics of the aggregate social context. Given that the underlying structure of the data is multi-level, estimating these effects using OLS violates the assumption of independent observations. HLM corrects for the possible bias related to this violation while allowing the user to treat both the dependent variables and the individual-level slopes as outcome variables of interest. For example, educational researchers have used the technique to study achievement by studying children and then "nesting" this analysis within classrooms and schools (Lee and Bryk, 1989; Garner and Raudenbush, 1991). In taking this approach, researchers are able to explain school achievement into the portion related to individual characteristics and the portion dependent on classroom or school-based factors.

Chapter 3:

Industrial Context, Labor Markets, and Opportunity Structures

As demonstrated in Chapter 1, there has been no theoretical or empirical shortage of criminological work focusing on aggregate-level unemployment and crime. Most macro-level theories of crime either explicitly or implicitly provide a role for employment and the last fifteen years has witnessed an increasing consensus concerning the relationship between employment and criminal offending. This relationship, which Chiricos (1987) argued is found more consistently in studies focusing on property crime and those utilizing smaller geographic aggregations, suggests an important connection between macro-economic forces and criminal behavior. Other researchers, wishing to model the relationship between employment and crime more thoroughly have examined unemployment disaggregated by age groups and focused on other components of employment patterns such as types of jobs (Allan and Steffensmeier 1989; Crutchfield 1989).

Expanding our understanding of how work influences crime requires a closer look at both the proposed causal mechanisms and the forces that begin the causal process. In their recent work on industrial composition and adolescent delinquency, Bellair and Roscigno (2000) expressed concern that too little attention has been paid to industrial structure in studies of crime and delinquency. While employment and other proximate economic factors have long been a focus of research in the area, less empirical attention has been given to the structural forces that precede employment patterns and the economic well-being of communities. Unemployment and poverty are not exogenous variables but stem from the opportunities available in the local

economy. The structure of these opportunities is the result of the industrial composition of the area.

In this chapter, I examine how county industrial composition, one of the macro-level forces that begins the process of labor market segmentation and the distribution of employment characteristics, influences aggregate rates of criminal behavior. Both its direct and indirect influence on crime, mediated by local employment patterns, community instability, and residential racial segregation will be examined. Broadening our view of the local employment and crime relationship to include the precursors to variables such as joblessness and part-time employment allows a more complete understanding of the relationship at the aggregate level.

Industrial Composition

Research focusing on the effects of industrial composition has been more prevalent in the area of social stratification. In this literature measures of macro-industrial characteristics have been added to human capital models in predicting individual-level outcomes such as earnings (South and Xu 1990), mobility (Pomer 1986; Jacobs 1983), and income disparities by gender and race (Kilbourne, England, and Beron 1994). Given the renewed focus on social disorganization (Bursik 1988; Stark 1989) and distressed urban communities (Wilson 1989, 1996), the absence of industrial composition in the criminological literature is especially unfortunate. Wilson (1996) and others (Sampson and Wilson 1995) have traced these issues, and their relationships to crime and other social ills, back to de-industrialization and shifts in the global economy. However, there has been little empirical research examining the effects of industrial composition across a sample of geographic areas (see Bellair and Roscigno 2000 for an exception).

In this chapter, I examine the degree to which industrial composition influences community labor market well-being and social organization, and how these factors affect

aggregate rates of criminal behavior. Conceptual models of the causal mechanisms that drive these relationships will also be discussed. This chapter links my dissertation to a larger body of research concerning the aggregate-level relationship between work and crime but expands the focus on the causal process to include macro-economic factors rarely included in criminological research.

The De-industrialization Thesis

William Julius Wilson argues that the de-industrialization of the U.S economy has been the driving force behind the development and growth of an urban underclass plagued by poverty, substance abuse, crime, and a variety of other social ills (Wilson 1989, 1996). Starting in the 1970s a general decline in urban manufacturing industries led to a drastic reduction in the labor market opportunities available to less educated urban residents. Hit especially hard were African-American city-dwellers who had fewer resources and faced discrimination in both employment and housing markets. Individuals who once were working in well-paid semi-skilled manufacturing jobs found themselves unemployed or working part time in retail sector jobs (the often used example is the fast food industry) – jobs that paid less, offered few benefits, and were less secure.

In addition to the individual-level effects of these lower quality jobs, that these shifts in employment were concentrated within specific communities created "concentration effects" by altering both the economic well-being, as well as the spatial and temporal distribution of human activity within the community. Groups of individuals who used to work at the plant during the day and earn enough to support a family were now hanging out on the corner or in the local tavern and barely made enough to survive. According to Wilson (1989, 1996) and Sampson and Wilson (1995), this shift in economic well-being and distribution of activity was detrimental to

family formation, community participation, and the support of local institutions such as schools, churches, community centers, etc. The negative consequences of the economic marginalization of large segments of the community encouraged those who could afford to leave to do so, further increasing the concentrations of poverty, joblessness, and community instability. All three of these factors arguably lead to a variety of social problems including increased substance abuse, and violent and property related criminal behavior.

In Wilson's argument, the causal mechanisms by which de-industrialization leads to crime are both macro and micro. For individuals living in de-industrialized areas, the bonds or investments stemming from rewarding employment are less likely to develop and the frustrations of poverty and blocked opportunity are more likely to increase. At the macro-level the disorganization and instability of the community can lead to increased criminal opportunity through a decrease in community supervision and guardianship. Higher levels of unemployment also leads to larger numbers of individuals spending time in public spaces such as street corners, bars, and arcades. These groups of individuals serve to increase criminal opportunity by facilitating access to accomplices, targets and victims. The degree to which these different causal processes are driving the relationship Wilson finds between industrial characteristics and crime is difficult to parcel out. Using only aggregate data there is no way to determine which individuals are being influenced and whether the causal process is operating at the individual or macro level.

General support for the de-industrialization thesis has come from three different empirical approaches. Wilson (1989, 1996) has used aggregate-level data from specific urban locations to illustrate how shifts in industrial composition have influenced patterns of employment, resulting in higher rates of joblessness, poverty, and out-of wedlock births. While this approach is especially useful in demonstrating a framework through which de-industrialization might occur, it is limiting in that it is difficult to generalize the findings given the

historical uniqueness of the observed areas. For instance, while the de-industrialization of Chicago may have led to increased residential segregation, poverty, joblessness and crime, would similar shifts in industrial composition look the same in a non-rustbelt city in the south? In short, is this process limited to large urban areas with substantial African-American populations or would a decrease in manufacturing and an increase in retail jobs have similar effects in a smaller more racially heterogenous locale? These unanswered questions do not necessarily suggest weaknesses in Wilson's analyses, only that his focus on the influence of industrial composition was limited to urban areas with large black populations that were experiencing rapid increases in a variety of social ills. He was trying to explain the social problems of urban areas in rustbelt cities more than he was examining the broader consequences of macro-economic shifts in industrial concentrations and labor force participation.

Scholars working in urban ethnography have also added support to the de-industrialization thesis. Both Mercer Sullivan (1989) and Elijah Anderson (1990, 1999) explored the roles of work and crime among inner-city youth. While their approach and populations studied were somewhat different, they both found support for the idea that limited employment opportunity (created by macro-economic shifts) partially explained criminal involvement. They also found that desistance from criminal behavior was usually fueled, at least in part, by stable and rewarding employment. Like Wilson's research, however, their examinations were limited to geographically and demographically unique groups of individuals, making them difficult to generalize more broadly. Unlike Wilson's research, as their unit of analysis was the individual, their explanations were contained to micro-level causal processes focusing on limited opportunities and a lack of investment in conforming lines of activity.

The evidence from this ethnographic research points to similar conclusions as the quantitative work discussed above. Its detail and focus on individual processes is more useful in

assessing theoretical mechanisms for linking employment and crime. However, it should be noted that the sampling frame and scope of Sullivan and Anderson's work was limited to a small number of individuals in a few neighborhoods, while the quantitative analyses were able to asses trends across large metropolitan areas.

Perhaps the most generalizable findings that have been offered as broad support for the de-industrialization thesis focus on how community and neighborhood-level variables thought to result from macro-economic shifts influence other aggregate factors (e.g. unemployment, mobility, etc) as well as individual-level behaviors (e.g. drug use, crime, etc). As a test of social disorganization theory, Sampson and Groves (1989) examined whether community characteristics such as economic status, ethnic heterogeneity, residential mobility, and family disruption increase levels of social disorganization, which in turn, increase rates of delinquency and crime. While their focus was more on the proximate processes that mediate the influence of community-level characteristics, their findings offer strong support to a process linking community characteristics to individual-level behavior, the origins of which Wilson (1989, 1996) and others have argued stem from industrial composition.

In a more specific examination of Wilson's thesis, Sampson (1987) examined the degree to which urban black violence can be explained by male joblessness and family disruption. He concluded that the effects of aggregate-level family disruption on black rates of violence are very similar to the effects observed among whites. The higher rates of violence among blacks are attributed to higher rates of joblessness and the influence this has on family disruption. By treating black male joblessness and economic deprivation as exogenous variables, Sampson does not address the role of industrial composition. These findings do, however, support the latter half of the process relating to family structure as outlined by Wilson (1989, 1996).

In a direct test of Wilson's theory of structural disadvantage, Krivo and Peterson (1996) examined whether extreme disadvantage (indicated by poverty, joblessness, female headed households, and the percentage of professional workers) would be accompanied by extreme poverty. The other possibility being that the relationship between economic well-being and crime would be linear, and that there would not necessarily be especially large increases in crime in highly disadvantaged areas. They also examined whether these effects would be similar for predominantly white and predominantly black neighborhoods. They found a non-linear relationship between disadvantage and violent crime in which extreme disadvantage led to exceptionally high rates of violent crime, and a linear relationship between disadvantage and property crime. This relationship was consistent across white and black neighborhoods.

Crutchfield, Glusker, and Bridges (1999) examined how high school drop out rates and the development of underclass neighborhoods influenced tract-level homicide rates in Detroit, Seattle, and Washington D.C. Each of these cities represented very different industrial structures and levels of labor force involvement. The direct effects of labor force involvement were only significant in Washington D.C.. The indirect effects were mediated by underclass development and high density neighborhoods with many non-married adults in Cleveland and Washington, and by increased levels of high school drop out rates in Cleveland and Seattle. These findings offer further support to Wilson's theory of de-industrialization, underclass development, and crime. Cleveland which experienced massive job loss as a result of rapid de-industrialization is a prime example of the process Wilson proposed. These findings also provide support for the argument that industrial composition can be influential in other contexts as well. Neither Washington D.C. nor Seattle have experienced similar levels of de-industrialization. Yet, they both have significantly bifurcated labor markets divided by skill and education barriers. The indirect influence of labor market participation, both unemployment and employment in specific sectors,

on homicide suggest the importance of industrial composition and labor force involvement in non-rust belt cities as well.

While much of the literature concerning industrial composition has focused on the effects of macro-economic changes on inner city poverty and well-being , a smaller body of work has explored the effect industrial composition has on individuals and communities across a broader spectrum. Matching county-level census data with individual-level data from the Adolescent Health Survey, Bellair and Roscigno (2000) found adolescents living in counties with a higher percentage of jobs in professional industries were less likely to live in single parent homes and tended to have higher family incomes. Adolescents living in areas with higher levels of involvement in extractive industries (mining, hunting, and fishing) tended to have lower family incomes but were more likely to live with two biological parents. The latter effect was attributed to high levels of religious fundamentalism in areas dominated by extractive industries. These variables both indirectly decreased property and violent crime by increasing school attachment and decreasing time spent with delinquent peers. The authors concluded that adolescent delinquency was inversely related to perceptions of opportunity which were strongly influenced by the industrial composition of their local labor markets. This research offers a strong link between macro-industrial processes and individual-level delinquent behavior across a randomly selected national sample of respondents.

Using aggregate labor market involvement as a proxy for industrial composition, Crutchfield and Pitchford (1997) found that young adults with weak bonds to the labor market and living in areas with large groups of marginalized workers were more likely to participate in violent crime than other poorly bonded young adults living in areas with stronger local labor markets. This finding supports a connection between labor market segmentation and violent crime and suggests the importance of both aggregate and individual-level employment factors.

Labor market segmentation was thought to be primarily the result of industrial composition. These findings suggest that the negative influence of macro-economic shifts that alter the industrial landscape may not be limited to inner city minority populations living in rustbelt cities. In so far as these macro reconfigurations manifest in limited opportunity structures, the negative consequences that follow, such as unemployment and crime, may be more widespread than originally suggested. While we would expect concentration effects to be more severe in heavily populated areas, the primary effects of increased economic and employment marginalization may operate in suburban and rural areas as well.

The goal of the current analysis is to examine empirically the processes by which industrial composition influences community employment patterns, stability, and residential racial segregation. Factors, which in turn, influence rates of crime. While this has often been framed as an "underclass" argument focusing primarily on minority urban poor (and often limited to violent crime) the current analysis will examine this process across a large sample of geographic areas with a range of racial and ethnic compositions.

I draw on Wilson's conception of industrial composition, yet I take more of a labor market segmentation and crime perspective (Crutchfield 1989, Crutchfield and Pitchford 1997, Wadsworth 2000). I suggest that industrial composition may influence labor force participation and community stability in a fashion that is not limited to the underclass. Using prior research as a guide (Chiricos 1987; Crutchfield 1989; Allan and Steffensmeier 1989; Shihadeh and Flynn 1996), I anticipate that counties with higher levels of disorganization or instability, higher levels of segregation, and lower levels labor force opportunity are likely to have higher rates of both violent and property crime. Whether or not this process is unique to urban areas with large minority populations is also examined.

Conceptualizing Industrial Composition

While industrial composition can be conceptualized in a variety of different ways, the most common usage in the sociological literature has been to differentiate between industries that provide high quality jobs vs. industries that provide lower quality jobs. High quality jobs are often described as being more secure, offering better compensation and benefits, and providing more opportunities for promotion. Lower quality jobs, on the other hand, tend to be less secure, offer lower wages, fewer benefits and limited opportunity for upward mobility (Piore 1975). Researchers have also suggested that some industries are more likely to be unionized than others, resulting in increased job security and bargaining power. These characteristics have also been used to distinguish between primary and secondary sector employment (Piore 1975; Kalleberg and Sorenson 1979). Approaches to industrial composition have primarily focused on the labor market opportunities available to less educated, and often younger, individuals. Macro-economic shifts have altered the opportunities of older and well-educated individuals as well (Newman 1988). As these "white collar" shifts in opportunity structures have not been viewed as precursors to dramatic increases in social problems such as poverty and crime, they have received far less attention.

In the current analyses, I focus on the "lower end" of the labor market structure by examining entry-level type jobs for young and less educated adults. These are the individuals who are most likely to be involved in the types of criminal behavior that appear in official statistics (murder, rape, robbery, aggravated assault, larceny, burglary, and auto theft). Of the NLSY respondents who were over the age of seventeen and employed during the first wave of the survey, 54% of them were working in either the manufacturing, retail, or wholesale industries.[1]

[1] In the NLSY individual-level industry data, no distinction is made between respondents working in retail vs. manufacturing industries.

Figure 3-1 illustrates the industry involvement of all NLSY respondents over the age of 17 who reported being employed. [2]

Proponents of the dual labor market theory (Piore 1975, Kalleberg and Sorenson 1979), and the de-industrialization thesis (Wilson 1989, 1996; Sampson and Wilson 1995) have suggested that individuals within manufacturing industries will have more opportunity for promotion, receive better benefits, and be paid higher wages than individuals working in retail industries. Employees in the manufacturing industry are also more likely to be working under collective bargaining agreements adding additional security and stability to these positions. Given that a large percentage of young workers are employed in manufacturing and retail sectors, and the focus that these industries have received in the economics, labor market, and stratification literatures, this examination of industrial composition will focus on the labor market opportunities available in retail vs. manufacturing industries.

Industrial composition and labor market opportunities can be conceptualized at different levels of geographic aggregation. Previous research has used states, counties (Bellair and Roscigno 2000), cities (Crutchfield, Glusker, and Bridges 1999), and census tracts (Crutchfield 1989) as units of analysis to study the causes and effects of "local" economies. When examining the effects of labor force characteristics on crime, using large heterogeneous areas such as states as the units of analysis may confound the analysis due to a large degree of heterogeneity and intra-area variance. Using small areas such as tracts can also be problematic as residents are not limited to the labor markets existing within boundaries of these geographic aggregations. They

[2] Despite the fact that the NLSY over-sampled for disadvantaged and minority young adults, the industrial distribution of the respondents is not very different from the national average. In the 1980 Current Population Survey about 43% of the respondents aged 18 to 23 were working in either manufacturing, retail, or wholesale industries.

could easily work in the next tract over. I have chosen to use counties as the unit of analysis as they are more homogenous then states and are often driven by specific sectors of the economy. This also allows non-urban areas to be included in the analysis. These areas would not be included if cities were chosen as the unit of analysis.

The Industrial Composition and Crime Connection

Industrial composition may influence rates of property and violent crime in two ways. First, the proportion of positions in the labor market within the manufacturing and retail industries respectively shape the overall opportunity structures for young individuals living in the counties. Labor markets in counties that are dominated by manufacturing industries are likely to offer higher levels of employment, more full-time employment, rewarding wage structures, increased collective bargaining agreements, and more stable occupational positions. While little research has been done on the influence of unionization on crime, income, employment status, and job stability have all been shown to affect aggregate-level crime rates at the city and census tract level (Grogger 1998; Crutchfield 1989).

Second, the weaker opportunity structures that prevail in economies based on the retail and service industries are detrimental to the overall stability and organization of a community. Counties that are more dominated by retail industry experience higher levels of mobility. In short, less rewarding employment does not serve as an anchoring force and promotes higher levels of family disruption (due to economic hardship and employment difficulties). Wilson (1989, 1996) has also suggested that counties dominated by retail industries are likely to be more segregated as a weak labor market encourages those who can afford to move, often the non-minorities, to do so. The result is greater concentrations of minorities and poverty.

Both of these causal processes could be viewed as either macro or micro. As discussed in Chapter 1, the influence of aggregate-level unemployment or labor force marginalization could spread throughout a community by increasing (or decreasing) criminal opportunities and worsening perceptions of legitimate opportunity. These factors could change the overall involvement in crime among the community's residents. It is also possible that the effect of unemployment or marginalization would have a more individual effect. The structural forces may predominantly influence those individuals who are actually unemployed or otherwise weakly bonded to the labor market.

One of the interesting discussions in the area of economics, employment, and crime regards the types of crime for which economic arguments may be useful. Many economists, who view crime as a competing method of financial acquisition, suggest that economic explanations are best used to explain economically motivated crimes (Becker 1968; Grogger 1998). These explanations usually stem from individual-level processes. By contrast, sociologists have offered less bounded interpretations of how economics, employment, or opportunity structures may influence crime at both the individual and aggregate levels. As discussed more thoroughly in Chapter 1, these perspectives are more inclusive of different types of offending. They focus on causal mechanisms related to informal social controls such as investments and commitments (Hirschi 1969; Sampson and Laub 1993; Crutchfield 1989; Crutchfield and Pitchford 1997; Wadsworth 2000), the frustration that results from economic deprivation or limited opportunity, and the shifts in opportunity. These mechanisms, which may explain the relationships between poverty, unemployment, or limited opportunity and crime, are not limited to the explanation of economically motivated criminal behavior. For this reason, I expect industrial composition to have similar effects on property and violent crime rates. In the analysis I use disaggregated crime rates to test this hypothesis.

I expect the relationship between industrial composition and county crime rates to be mediated partially by indicators of county employment patterns, community stability, and residential segregation. These intervening variables do not completely capture the differences between manufacturing and retail industry dominated labor markets, nor the possible influence industrial composition has on crime. Thus after including these variables, the ratio of retail to manufacturing industry jobs may still have a direct effect on crime. However, the number of individuals who are jobless, and the proportion of those working who are working in part-time positions, which tend to be poorly compensated and less secure, address some of the important distinctions between the different labor market structures which may influence rates of crime. Measures of mobility and family disruption are indicators of the level of instability or disorganization in the county. A separate measure is used as an indicator of residential segregation. Therefore, part of the effects of industrial composition on crime may be mediated by employment patterns, community stability, and residential segregation, while the other part is theoretically attributable to unobserved disparities in the opportunity structures or other community processes untapped by the mediating variables.

Model Specification

The models I use to explore the aggregate-level relationships between industrial composition, county characteristics, and crime rates include a set of independent variables, mediating, or endogenous county characteristics indicating labor force involvement and social organization, and county crime rates. Figure 3-2 offers a path diagram for illustrative purposes.

Independent Variables

The independent variables include indicators of important county characteristics, some of which are exogenous and others that may have reciprocal causal structures. The industrial composition of the area is indicated by the proportion of the labor force that is working in retail industries compared to the proportion that is working in manufacturing industries (this includes both durable and non-durable manufacturing). This ratio indicates one of the key components suggested by dual labor market theory and the de-industrialization thesis. The composition of industries is apt to result from the availability of natural resources, patterns of migration, historical forces related to urban planning, and transportation routes. Staley (1992) has argued that local industry can also be influenced by criminal behavior, but his focus is on smaller, more homogenous neighborhoods and the growth of drug markets in the 1980's. It is likely that industrial composition as measured here is not influenced by any of the mediating or dependent variables in the model.

Indicators of the total population, the percentage of the population living in urban areas, and the percentage of the population that is African-American and Hispanic are all treated as independent variables in the models. These measures of overall size, urbanization, and racial composition have been found to be important predictors of crime rates in past research. It is possible that the overall size of the population and the proportion of minorities and urban dwellers are influenced by labor force variables and crime rates (indicators that are treated as mediating and dependent variables). While there may be some reciprocal effects, the causal process is expected to move primarily in the other direction. I have also included a set of dummy variables to control for the geographic region in which the county is located. Descriptions, means (or proportions), and standard deviations for all of the variables in the model are available in Table 3-1.

Mediating Variables

Four variables are expected to mediate part of the influence of industrial composition and the other exogenous variables on rates of violent and property crime. Community instability is a factor created from indicators of the percentage of the population that is divorced, and the percentage of the population that has moved in the last year. Both family disruption, and mobility have been demonstrated to be useful explanatory variables in studies of community crime rates. While influential on their own, putting them both into the models increases the likelihood of collinearity issues as they are highly correlated ($r=.524$, $p<.001$). Using confirmatory factor analysis (which generates factor loadings over .8), I have combined them to avoid this potential problem.

Joblessness is a measure of the percentage of the population age sixteen and over that is not working. Past research has suggested that this is a more useful indicator than unemployment as it captures both the "officially" and "unofficially" unemployed, as well as "discouraged workers", those no longer actively seeking employment. Part-time employment is an indicator of the proportion of the labor force that was working less than thirty-five hours per week or was out of work for at least three of the last fifty-two weeks.

Lastly, segregation is the index of dissimilarity score for the county. The index of dissimilarity measures the degree to which there is racial segregation, or unevenness, in a geographic area. This measure has been used extensively in research focusing on the population shifts that have occurred in urban areas (Massey and Denton 1993). It is computed using the number of African-Americans and whites in each census tract of the county. A score of "0" would suggest complete parity, that is, the overall percentage of African-Americans in the county was equal to the percentage of African-Americans in each census tract. A "1" would suggest that

the county was completely segregated and that no African-Americans lived in the same tract as whites.

Dependent Variables

The dependent variables are the rates of violent and property crimes known to the police per 100,000 people in the population in 1981. Violent crimes include homicide, rape, robbery, and aggravated assault. Property crimes include burglary, larceny, and auto theft. While the independent and mediating variables are aggregate percentages based on 1980 county characteristics, the UCR data representing crime rates is based on 1981 criminal activity. Using 1981 crime data controls for the reciprocal causality that could occur if using simultaneous measures. However, it could also mask important effects if 1980 crime rates were extremely high or low compared to recent years for a number of counties. To check for this possibility, I examined the correlations between 1980 and 1981 crime rates for specific types of property and violent crime. These correlations were extremely high suggesting that using 1981 rates should not add substantial bias to the models.[3] Another way of measuring crime rates in the counties is to take the average level of involvement in property and violent crime for all of the NLSY respondents living in each of the counties. Unfortunately, there are many counties with very few respondents. Over eighty percent of the counties include less than ten respondents. With such small samples and large amounts of variance across the individuals, these measures would not

[3] The correlations between available 1980 and 1981 crime rates were as follows: Aggravated Assault, r=.955, Robbery, r=.983, Burglary. R=.926, Auto Theft .972.

serve as very good indicators of the patterns of crime in the counties.[4] Table 3-2 shows the correlation matrix of all of the variables in the model.

Hypotheses

As mentioned above, it is anticipated that the industrial composition of a county will have both direct and indirect effects on crime rates. Counties in which the ratio of jobs in retail vs. manufacturing industries is higher will have higher rates of both property and violent crime due to a decrease in employment opportunities.

H1: The ratio of retail to manufacturing industry jobs will be positively related to violent and property crime rates.

These effects will be both direct and indirect, mediated through patterns of labor force involvement, community stability, and racial segregation.

H2: The ratio of retail to manufacturing industry jobs will be positively related to joblessness, part-time employment, community instability, and racial segregation.

H3: The influence of the ratio of retail to manufacturing industry jobs will be reduced when joblessness, part-time employment, disorganization, and segregation are added to the model. However, it will still be an influential effect.

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[4] To test this possibility, I examined the correlations between the NLSY within county averages with the UCR rates for violent and property crime. Neither of the correlations were very large or statistically

The county characteristics indicating weak labor force opportunity, community instability and racial segregation will all have a positive effect on crime rates.

H4: Holding the ratio of retail to manufacturing industry jobs constant, counties with higher rates of joblessness, part-time employment, disorganization, and segregation will have higher rates of violent and property crime.

In addition to acting as an exogenous variable, it is also possible that the percentage of the population living in urban areas will interact with the intervening variables representing labor force involvement to suggest conditional relationships. Unemployment and part-time employment may have a stronger influence on crime in urban areas due to "concentration effects" which may be more influential in heavily populated communities.

H5: The effects of joblessness and part-time employment on violent and property crime will be stronger in counties with larger urban populations.

Lastly, in addition to a general concentration effect, it is possible that there will be an "underclass effect". There may be higher rates of crime in counties with poor labor force opportunities that also have large urban and large black populations. If this is true, it would suggest that combined types of disadvantage may be especially detrimental.

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significant.

H6: The effects of joblessness and part-time employment on violent and property crime will be stronger in counties with large urban and black populations.

Data and Analyses

The data for these analyses come from the U.S. Census of Housing and Population and the Federal Bureau of Investigation's Uniform Crime Reports. Information pertaining to the demographics of the population, the industrial and racial composition, employment patterns, migration, the region of the country, and rates of property and violent crime were drawn from these sources for a sample of counties in the United States. This sample (N=545) consists of counties with at least one NLSY respondent. Using this sample allows the nesting of individuals within geographic areas.

The NLSY79 sample consists of three independent probability samples; a cross-sectional sample representative of the national population (N=6,111), a supplemental sample that over-sampled black, Hispanic, and economically disadvantaged non-black, non-Hispanic youth, (N=5295), and a military sample (N=1280). As the military sample does not provide geo-coded information, counties in which these respondents resided are not included in the sample. The first stage of the sampling process drew on two hundred and four Primary Sampling Units (PSUs). PSU's include Statistical Metropolitan Areas, counties, parts of counties, and independent cities. As stratification designed to over-sample was introduced in the selection of PSU's it is likely that the sample of counties included in the present analysis includes an overrepresentation of counties with large black, Hispanic, and economically disadvantage white populations. Table 3-1 shows

the means and standard deviations for both the counties included in the sample, and for all counties in the United States.[5]

The NLSY sample of counties tend to have lower ratios of retail to manufacturing industry jobs. They are substantially more urban and have slightly larger black populations. States in the Northeast are over-represented. The mean rate of joblessness and part-time employment in the sample of NLSY counties is very similar to the national average. While the differences make it more difficult to generalize the findings to all counties in the U.S. with complete confidence, overall, they are fairly modest.

The statistical technique used in these analyses is ordinary least squares regression. There were a small number of cases for which crime rate data was missing (N=7). These cases were dropped from the analysis. Segregation was the only other county-level variable for which there were missing data. Some counties in the U.S had not yet been fully divided into tracts (or at all) when 1980 census information was collected. Without the tracts or some other geographic area smaller than county, there is no way to compute the index of dissimilarity. There were sixty counties in the sample for which this was the case. Leaving these counties out of the analysis would create selection bias as the counties with missing data are more likely to be in rural or suburban areas. To address this issue I imputed index of dissimilarity scores from 1990 census data for the missing values. I also included a dummy variable indicating that the value had been imputed to check for significant imputation effects. There were none.

Results

Overall, the results from the aggregate-level analyses offer strong support to the prediction that the industrial composition of a county will both directly and indirectly influence

[5] Information on racial segregation was only computed for counties represented in the NLSY..

rates of criminal behavior. The first hypothesis (*H1*) suggested that counties with higher ratios of retail to manufacturing industry jobs would demonstrate higher rates of violent and property crime. After controlling for the overall size of the population, the percentage living in urban areas, the racial composition, and the region of the country, the industrial composition of a county significantly influenced the rates of both property and violent crime. Counties in which the ratio of retail sector jobs to manufacturing jobs was higher tended to have more property and violent crimes per hundred thousand people in the population, than counties in which the ratio of retail to manufacturing jobs was lower. Both of these relationships are statistically significant. Table 3-3 shows the standardized coefficients from the models predicting violent and property crime rates.

This set of models also demonstrates the significance of the variables representing population size, racial composition, percentage of the population living in urban areas, and the geographic region of the country. Counties with larger populations had significantly higher rates of violent crime than counties with smaller populations, but had similar rates of property crime. Counties with larger black and Hispanic populations tended to have higher rates of both violent and property crime. While all of these relationships are statistically significant, the larger standardized coefficients representing the effect of racial composition on violent crime (when compared to property crime) suggest that racial composition is more influential on violent crime. This is especially true for the percentage of African-Americans living in the counties. The unstandardized coefficients show that the effect of racial composition is about three times as strong for blacks compared to Hispanics in the violent crime equation and about twice as strong for blacks in the equation predicting property crime. Counties in the west tended to have higher rates of both violent and property crime, when compared to the northeast, while counties in the north-central part of the country had higher rates of property crime, but similar rates of violence

when the same comparison is made. The rates of violent and property crime were not significantly different in the southern region of the country when compared to the northeast.

The total effects displayed in Table 3-3 may be partly mediated by the influence of county employment patterns, community instability, and residential segregation. As can be seen in Table 3-4, as the ratio of retail sector to manufacturing sector jobs gets larger, community instability increases ($p<.001$), the percentage of the labor force that is not working increases ($p<.01$), and the percentage of those who are in the labor force but are only working part-time also increases ($p<.001$). These findings are all statistically significant even after controlling for other important factors related to population size, racial composition and geographic region.

Industrial composition does not appear to be related directly to the degree of residential segregation in the county. However, when the indicator of residential segregation is regressed on both the exogenous variables and the mediating variables, representing county employment patterns and community instability, it appears that joblessness has a positive significant relationship and that part-time employment has a negative significant relationship with residential segregation. This finding suggests that industrial composition has both an indirect positive effect mediated by joblessness and an indirect negative effect mediated by part-time employment on residential segregation. Collectively, these findings are supportive of the second hypothesis (***H2***) which predicted that the industrial composition would significantly influence patterns of labor force involvement, community stability, and residential segregation.

Joblessness is also influenced by the percentage of the population living in urban areas, racial composition, and regional location. More urban counties, counties with lower percentages of blacks and Hispanics, and counties in the western region of the country (using the northeast as the comparison) all have significantly lower levels of joblessness. Counties located in the north-central region (again, when compared to the northeast) and counties in which lower percentages

of the population living in urban areas tend to have a higher proportion of the work force working part-time. With the exception of overall population size, all of the variables included in the model predicting community instability are significant. More urban counties, and those located anywhere outside of the northeast tend to have higher rates of community instability. Counties with higher percentages of blacks and Hispanics tended to have lower levels of instability. In addition to joblessness and part-time employment, the overall population and the percentage living in urban areas are positively associated with segregation. Location in the western or southern regions of the country, when compared to the northeast, are negatively related to racial segregation.

While the magnitude of influence varies and in some cases has opposite effects, joblessness, the proportion of workers who are employed part-time, community instability, and segregation are all related to county crime rates. Tables 3-5 and 3-6 show the findings from regression analyses for violent and property crime including the original county-level industrial composition and demographic variables, along with the community instability and regional employment variables.[6] Models 2 through 5 also include interaction terms that determine whether the relationships suggested in Model 1 differ across urban and rural areas or in urban areas with large African-American populations.

Model 1

The first model in both Table 3-5 and Table 3-6 shows the unstandardized and standardized (in italics) regression coefficients representing the effects of the exogenous and mediating variables on violent and property crime. The percentage of the labor force that is not

[6] Region of the country was removed from the table in order to fit it on the page. Tables with region are available in Appendix 3-A.

working is positively and significantly related to county rates of violent crime and is significantly *negatively* related to the rate of property crime. The percentage of workers who are working part-time has a significant *negative* effect on the violent crime rate and a significant positive effect on rates of property crime. The indicators of community instability and residential racial segregation are related to both the violent and property crime rate in almost every equation in the analysis.[7] Counties that are less stable (or more disorganized) and more segregated experience higher levels of both property and violent crime. Together, these findings offer mixed support to the hypothesis (***H4***) that predicted that after controlling for industrial composition, counties with higher rates of joblessness, part-time employment, community instability, and segregation would have higher rates of property and violent crime. It is interesting to note that perhaps the best indicator of labor force opportunities, joblessness, is significantly positively related to violent crime and significantly negatively related to property crime. This does not support an economic explanation for the relationship between work and crime. If crime were acting as an income substitution, we would expect a positive relationship between joblessness and property crime and not violent crime. Explanations for why these aggregate-level factors have opposite effects on the two types of crime will be explored in the discussion section.

It is interesting to note that the unstandardized coefficients representing the effects of industrial composition on violent and property crime are reduced by about a half in the case of property crime and by a third in the model predicting violent crime after the mediating variables are added to the models. After adding these variables, the ratio of retail to manufacturing industry jobs still has a significant effect on property crime, but not on violent crime. This suggests that industrial composition influences property crime above and beyond its role in determining

[7] The one exception being the model that includes the three-way interaction representing the effects of percent black*percent urban*percent working part-time. In this equation residential segregation is not

patterns of employment, mobility, and residential segregation. This is partially supportive of the hypothesis (***H3***) predicting that after the mediating variables are added to the equation the effect of industrial composition would be reduced but still apparent. These findings also suggest, however, that the effects of industrial composition may vary across types of criminal behavior. This was not predicted.

Model 2 – Joblessness in Urban Areas

The degree to which the effects of industrial composition are dependent upon other characteristics of geographic areas such as urbanization and the size of the minority populations can be explored using interaction terms that specify combinations of aggregate characteristics. Due to issues of collinearity, these interaction terms must be included in the regression equations one at a time.[8] Model 2 in both Table 3-5 and 3-6 demonstrates the multiplicative effects of the percentage of the labor force that is not working and the percentage of the population living in urban areas on both violent (Table 3-5) and property (Table 3-6) crime. The findings indicate a statistically significant positive relationship between the interaction term and both violent and property crime. This suggests that the negative relationship between joblessness and property crime demonstrated in Model 1 may not exist in more urban counties. Concerning violent crime, while Model 1 demonstrated a significant positive relationship between joblessness and violent crime across all counties, this relationship appears to be significantly stronger in counties with larger urban populations.

To examine these interaction effects more closely I used the ordinary least squares equations to generate predicted value estimates of crime rates for counties with varying levels of

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statistically significant.

joblessness and urbanization. Figure 3-3 shows that in completely rural counties the relationship between joblessness and violent crime is slightly negative. In moving from 37.4% jobless (one standard deviation below the mean) to 50.6% jobless (one standard deviation above the mean), the number of violent crimes per 100,000 people decreases by about 70. In urban counties the relationship is strong and positive. This same shift in joblessness results in an increase of about 280 violent crimes in a county composed entirely of urban residents.

Figure 3-4 also shows striking differences between urban and rural areas when examining the effects of joblessness on rates of property crime. In entirely urban counties, the line representing the relationship between joblessness and property crime rates is virtually flat. Jobless had little or no effect on property crime. Yet in rural counties, a shift in joblessness from one standard deviation below to one standard deviation above the mean is accompanied by a 20% decrease in property crime (from 5000 to 4000 crimes per 100,000 people). These predicted value graphs demonstrate that holding all other variables constant joblessness appears to decrease crime rates (property crime) in rural areas, and increase crime rates (violent crime) in urban areas.

Model 3- Part-time Employment in Urban Areas

The third model in Tables 3-5 and 3-6 include the variables in Model 1 as well as an interaction term representing the multiplicative effects of part-time employment and the percentage of the population living in urban areas. The coefficient representing the interaction term in the violent crime model is not significant, suggesting that the multiplicative effects of part-time employment and the percentage urban has no effect on violent crime rates. Model 3 in

[8] The correlation between the interaction terms representing urban*jobless and urban *part-time employment is .968.

Table 3-6 demonstrates that this same interaction term has a significant positive effect on the rate of property crime.

Again, I examined these interactions more closely be generating predicted value estimates. Figure 3-5 shows that the line representing the relationship between violent crime rates and part-time employment in entirely rural counties displays a strong negative slope. A shift in part-time employment from one standard deviation below to one standard deviation above the mean is accompanied by about a 30% decrease in violent crime. However, for entirely urban counties the line is basically flat. The relationships between part-time employment and violent crime in counties falling between the two ends of the urban/rural spectrum are similar to that of the entirely rural counties.

Figure 3-6 shows the predicted relationships between property crime rates and part-time employment in counties with varying levels of urbanization. The lines suggest that the more urban the county is, the stronger the positive relationship between part-time employment and property crime rates. In counties in which none of the population lived in urban areas a shift from 32.2% part-time (one standard deviation below the mean) to 45% part-time (one standard deviation above the mean) caused property crime to increase from about 3800 to about 4200 crimes per 100,000 people in the population (a 10% increase). In entirely urban counties the same shift in part-time employment is accompanied by an increase of almost 900 crimes per 100,000 (about a 20% increase).

Collectively these findings offer some support to the hypothesis (***H5***) that predicted that the effects of weak labor force opportunity would be stronger and more likely to be positive in urban areas. Without specifying the urban/rural composition of the county, the proportion of the labor force employed and the percentage of those working who are working at part-time jobs have opposite effects of each other, and across the different types of crime. As the proportion of

the work force working part-time gets larger property crime increases and violent crime decreases. Conversely, as joblessness goes up violent crime also goes up, but property crime goes down.

However, when joblessness and part-time work are interacted with the percentage of the population that is living in urban areas, the implications of labor market participation becomes notably different for urban and rural areas. Joblessness increases violent crime in urban areas and has a slight negative effect on violent crime in more rural areas. The effects of joblessness on property crime are almost the exact opposite. There is virtually no effect in urban areas and a significant negative influence in more rural areas. Part-time employment has little effect on violent crime in urban areas, but a large negative effect in rural areas. The effect of part-time employment on property crime is positive in both urban and rural areas, however its effect in urban areas is much stronger. The general trend suggests that depending on the indicator, limited opportunity can increase violent and property crime in more urban counties and is more likely to decrease violent and property crime in rural areas.

Models 4 and 5 – The Underclass Argument

To address Wilson's theoretical arguments (1989, 1996) concerning the influence of de-industrialization on the formation and the behavioral patterns of the underclass, I analyzed one more set of models that includes three-way interaction terms representing the presence of large African-American, urban populations with weak labor force involvement. Hypothesis six (***H6***) predicted that these interaction terms would significantly increase both violent and property crime rates. The fourth model in each of the tables shows that the interaction term representing the multiplicative effects of the percentage urban, the percentage black, and the percentage jobless has a positive, significant relationship with both violent and property crime rates.

Expected value estimates illustrating these findings (see Figure 3-7) show that the effect of a two standard deviation change in joblessness (from one standard deviation below the mean to one standard deviation above the mean) is accompanied by an increase of about 85 violent crimes per 100,000 people (a 21% increase) in urban counties with small black populations (5% or less). In urban counties with large black populations (35% or more) a similar increase in joblessness results in about 175 more violent crimes per 100,000 people (a 20% increase). The percentage increase is about the same, but higher joblessness increases the overall number of violent crimes by almost twice as much in urban areas with large verses small black populations.

The predicted value estimates for equations representing the effects of joblessness on property crime are shown in Figure 3-8. In urban counties with small black populations, joblessness has a small negative effect on property crime. A two standard deviation increase in joblessness results in about 200 fewer property crimes per 100,000 people in the population (a 3.5% decrease). In urban counties with large black populations, joblessness has virtually no effect on property crime.

Model 5 in Table 3-5 and 3-6 shows the effects of the interaction term representing the multiplicative effects of the percentage urban, the percentage black, and the percentage of the labor force who are working part time. All of these effects are significant, even after controlling for the influence of the two-way interaction terms representing the interactive effects of the percentage of the population living in urban areas and the two measures of labor force involvement. Expected value estimates in Figure 3-9 and 3-10 show that in urban areas there is a positive effect of part-time employment on both violent and property crime in counties with large and small black populations. However these relationships are much stronger in counties with large black populations. In the case of violent crime (Figure 3-9 going from 32.2% to 45% part-time employment increases the rate of violent crimes per 100,000 by only 10 crimes in counties

with small black populations (about a 2.5% increase) and by about 175 crimes in counties with large black populations (a 16% increase). This shift in part-time employment increases property crime rates by about 300 crimes per 100,000 people (about a 7% increase) in urban areas with small black populations and by about 650 crimes (a 10.5% increase) in urban areas with large black populations.

Discussion

The findings from these analyses offer support to many of the hypothesized relationships. First, I suggested that the industrial composition of counties would have a significant relationship with both the violent and property crime rates. The coefficients representing these relationships are statistically significant in the original models (Table 3-3). For models examining property crime the effect of industrial composition remains significant when the labor force participation, community instability, and racial segregation are added to the model. The influence of industrial composition on violent crime becomes insignificant when these mediating variables are included. The general resilience of the main effects of industrial composition on property crime suggests that the ratio of retail to manufacturing industry jobs influences rates of property crime through processes that are not fully captured by labor force participation or the other variables proposed in the mediating processes.

One of these processes may be the creation of criminal opportunities. It is possible that criminal opportunity mediates some of the effects of industrial composition on crime. Both the presence of a large retail industry, as well as employment situations that offer access to theft targets may increase the opportunity for economic crimes such as burglary and larceny. The larger presence of retail industry is less likely to increase opportunities for violent crime, an activity that is more dependent on human interaction then the presence of theft targets. It was

anticipated that the variable representing industrial composition would have similar influences on violent and property crime. The direct effects are similar, but many of the indirect effects are not.

I also hypothesized that the industrial composition of a county would influence patterns of employment (indicated by joblessness and part-time work) levels of instability or disorganization, and the degree to which the county was racially segregated. The coefficients indicate significant relationships between industrial composition and joblessness, part-time work, and community instability. Counties with higher ratios of retail to manufacturing industry employment tend to have higher rates of joblessness, a greater proportion of the workforce employed in part-time positions, and higher levels of mobility and divorce. All of these relationships are statistically significant.

The influence of industrial composition on patterns of labor force participation has been discussed extensively in the literatures of labor economics and economic sociology (Piore 1975; Kalleberg and Sorenson 1979). Often using the language of dual or segmented labor market theory, researchers and theorists have pointed to the different employment characteristics of various industries. The current findings concur with previous research suggesting that labor markets dominated by manufacturing tend to have lower levels of joblessness, and more of the positions tend to be full-time.

Community instability or disorganization, as indicated by divorce and mobility, may be related to industrial composition in a number of ways. First, the lack of stable employment opportunities provides few "occupational anchors" to keep individuals from moving around. While obviously affecting mobility, this process may also facilitate family dissolution by decreasing the routinization and stability that regular employment provides and forcing individuals to move, with or without their families, to secure employment. The lack of economic opportunity in weak labor markets will also effect the ability of parents (especially males) to

support their families. This inability to fulfill ones role at the individual level may aggregate up to increasing levels of divorce.

As anticipated, the effect of industrial composition on segregation is more complex. While there was not a direct significant relationship between the two, there was both a significant positive path between industrial composition and segregation, mediated by joblessness, and a significant negative path between them mediated by part-time employment. Wilson has argued that one of the main causes of increased segregation has been the declining availability of stable jobs in inner-cities (Wilson 1989, 1996). He suggests that as good jobs disappear, those who cannot afford to leave (disproportionately minorities) are left behind while those with more financial or social resources re-locate to areas with better opportunity structures. This process encourages the increased concentration of minorities in areas with few good jobs. The finding that industrial composition influences residential segregation by increasing rates of joblessness in the county is illustrative of the causal mechanism that Wilson discussed (Wilson 1989; 1996). The finding that part-time employment has an inverse relationship with segregation is less expected. Segregation is also related to the size of the population, the percentage of the population living in urban areas, and the geographic region of the country.

Model 3-1 also suggested that joblessness, part-time work, community instability, and residential segregation mediate part of the influence of industrial composition by directly influencing property and violent crime rates. While all four of the intervening variables are related to rates of crime, their influence is more complex than expected and varies across both the indicators of labor force participation and the two types of criminal behavior.

Before considering the interactive effects between work-force participation and levels of urbanization, Model 1 in Table 3-5 demonstrates that joblessness has a significant *positive* effect and that part-time work has a significant *negative* effect on the violent crime rate. Model 1 in

Table 3-6 suggests that joblessness has a significant *negative* effect and that part-time employment has a significant *positive* effect on the property crime rate. Given my hypotheses that all four of these relationships would be positive, these initial findings offer only partial support to this part of the conceptual model.

Concerning the role of labor force involvement, the indirect effects causing the ratio of retail to manufacturing jobs to increase the violent crime rate are only mediated through joblessness, and the indirect effects mediated by the percentage of the work force employed part-time only act to increase property crime. While this does offer general support to Wilson's writings on the underclass (Wilson 1989, 1996) as his focus was primarily on joblessness and violent crime, it appears to be somewhat in contradiction with the findings from meta-analyses examining the relationship between joblessness and crime (Chiricos 1989) and studies that have focused on the effects of secondary sector employment (Crutchfield 1989; Crutchfield, and Pitchford, 1997; Crutchfield, Glusker and Bridges 1999) which found that the existence of large segments of marginally employed individuals (part-time or under-employment could be one form of marginalization) tends to increase the rate of violent crime.

While these findings are at odds with both the hypotheses and some of the referenced research, they are not unprecedented. An explanation for the negative relationship between joblessness and property crime has been proposed in previous research. Drawing on the ideas of the routine activities and crime perspective (Cohen and Felson 1980), it has been suggested that in areas where large percentages of the population are unemployed, there are fewer "unguarded" targets for theft. It is harder to burglarize a residence when more people are staying at home instead of working.

The significant negative relationship between violent crime and part-time work was a surprise, yet also not unprecedented. Much of the violent crime is committed by adolescent

males. Young males also are apt to be the most susceptible to labor force marginalization. Once joblessness is held constant, the percentage of the labor force that is working part-time may act as an indicator of labor force opportunity for younger workers. For example, in an area with high unemployment, the availability of part-time work may serve as a buffer to even higher rates of unemployment. Adolescents may be the most likely to benefit from this buffer. In this case, part-time employment may be able to act as a deterrent to violent criminal behavior. This finding is similar to the conclusions reached by Allan and Steffensmeier (1987). While their focus was on property, not violent crime Allen and Steffensmeir found that the availability of low paying jobs decreased property crime among adolescents, but not young adults. If the county violent crime rates are influenced heavily by the criminal behavior of adolescents, a similar explanation may be plausible.

The findings related to the relationships between joblessness and violent crime and part-time employment and property crime were more in agreement with the hypotheses and previous literature. As discussed earlier, the positive relationship between joblessness and violent crime can be attributed to lower levels of investment and commitment to employment and the larger concentrations of potential perpetrators and victims spending time in public spaces such as street-corners, bars and arcades. The significant positive relationship between the percentage of the labor force working part-time and rates of property crime is likely to be related to the same set of factors (lack of investment in conventional lines of action) used above to explain the relationship between joblessness and violent crime. Part-time employment is less likely to facilitate guardianship than joblessness as the spatial distribution of social activity is not as affected as in the case of joblessness. Therefore the process by which joblessness lead to a decrease in property crime is less likely to result from high levels of part-time employment.

The other two mediating variables, community instability and residential segregation, demonstrate consistent positive relationships with both violent and property crime rates. Together with the findings from Table 3-4, this suggests that industrial composition, in part, influences the aggregate levels of violent and property crime by increasing levels of community instability and residential segregation. This finding is especially relevant to studies of social disorganization. While migratory patterns, family structure, and racial segregation have often been treated as exogenous variables in models of disorganization (Crutchfield, Geerken, and Gove 1982; Sampson 1987), these findings propose that the causal process can be traced back to macro-economic changes that influence local economies.

Shihadeh and Flynn (1986) have suggested that racial segregation will lead to criminal behavior by increasing levels of economic disadvantage, cultural isolation, and political dis-empowerment. The current analyses do not address the intervening process discussed in their work, but do offer support to their claim that areas with higher levels of segregation will experience higher rates of criminal behavior. There was no direct significant relationship between industrial composition and segregation, however, the ratio of retail to manufacturing jobs significantly influenced rates of joblessness and part-time employment. In turn, joblessness significantly increased levels of segregation, while part time employment had a weaker, but significant negative effect on residential segregation. These findings add mixed support to the de-industrialization thesis as described by Wilson (1989, 1996).

The degree to which these intervening variables mediate the influence of industrial composition on the crime rates is demonstrated by the decrease in the unstandardized coefficients representing the direct effects of industrial composition. In moving from the reduced form model illustrated by the models in Table 3-3 to the models in Table 3-5 and Table 3-6 which include the mediating and interaction variables, the direct effects of industrial composition on violent crime

decrease from twenty to sixty five percent depending on which equation is examined. In the case of property crime the direct effects of industrial composition are reduced by between forty and sixty percent. These reductions suggest that large parts of the "industrial composition effect" can be attributed to the role it has in shaping opportunity structures and encouraging community stability.

The Role of Urbanization

Stopping here, one might conclude that while the ratio of retail to manufacturing jobs appears to increase violent and property crime rates across the sample of U.S. counties, the indirect pathways related to employment patterns, community stability, and racial segregation may be both aggravating and mitigating the relationship. The pathways mediated by segregation and community instability, joblessness in the case of violent crime, and part-time employment in the case of property crime may explain part of the overall relationship between industrial composition and crime, but the pathways mediated by joblessness, when considering property crime, and part-time employment when considering violent crime are acting to decrease the overall effect of industrial composition on county crime rates. Examining the possibility of conditional relationships adds some clarity to these findings.

One of the questions posed at the beginning of the chapter was whether or not the influence of industrial composition on crime, as discussed by Wilson (1989, 1996) and those focusing on labor market segmentation (Crutchfield 1989; Allan and Steffensmeier 1989; Crutchfield and Pitchford 1997; Crutchfield, Glusker, and Bridges 1999), would be constant across urban and rural areas. This question can be explored by looking at the equations that include interaction terms representing the multiplicative effect of the employment patterns and the percentage of the population living in urban areas. The significant positive coefficients,

representing the effects of the interaction terms in Models 2 and 3 in Table 3-5 and Table 3-6 suggest that joblessness and part-time employment have a stronger positive (or in some cases, a weaker negative) influence on crime rates in more urban counties. Examining estimated values offers further clarification concerning these conditional relationships.

When interacted with percentage urban, the multiplicative effect of joblessness and urbanization on both violent and property crime rates and the influence of part-time employment on property crime rates are all positive and statistically significant. The influence of part-time employment interacted with percentage urban on the violent crime rate is not significantly different from zero. By considering conditional relationships (or multiplicative processes) the relationship between joblessness and property crime which had been significant and negative, is shown to vary depending on the level of urbanization in the county. In rural areas increased joblessness decreased the rate of property crime. In urban areas such an increase had no effect. The overall relationship between joblessness and violent crime that was shown to be positive in Model 1 is actually a strong positive relationship in urban areas and a weak negative relationship in rural areas.

Part-time employment is related to an increase in property crime and a decrease in violent crime before interaction terms are included in the model. The predicted value estimates from the multiplicative models suggest that while part-time employment decreases violent crime in rural areas, it has no effect in urban areas. Conversely, the proportion of the labor force working part-time has a fairly small positive effect on property crime in rural areas and a much larger effect in urban areas.

The findings clearly suggest that the process through which labor force participation and employment opportunities influence aggregate rates of crime is quite different in urban and rural counties. In general, weak labor markets appear to increase crime in urban areas and decrease

crime in rural areas. However, these findings also vary significantly across different types of crime. Both of these findings suggest a more structural interpretation of the employment crime relationship that goes beyond treating crime as a substitute for legitimate employment.

The importance of the percentage of the population living in urban areas when considering the relationship between joblessness and property crime may relate back to the original explanation for the negative effect of joblessness on property crime, unavailable targets. While joblessness may decrease investments that can deter property crime, it also leaves more people at home serving as guardians for their and their neighbors' belongings. Effective guardianship depends on certain levels of informal community organization and networks, through which individuals get to know their neighbors and experience a sense of investment in the larger neighborhood well being. Given increased anonymity and weaker neighborhood networks, this process is less likely to happen in more urban areas. Therefore, the guardianship that accompanies higher rates of joblessness may be less of a deterrent to property crime in counties in which larger percentages of the population live in urban areas. Individuals staying at home may be guarding their own belongings, but due to weak neighborhood networks, they may be less useful as deterrents to the theft of other people's property. It is also possible that unemployment in urban areas is less likely than in rural areas to leave people at home due to increased options for public socializing.

Targets for property crime will also vary across urban and rural counties. In rural areas these targets may disproportionately be the personal belongings of others, while in more urban areas they involve stores, commercial industries, etc. The type of guardianship increased by weak labor force involvement at the community level will more effectively guard personal belongings than commercial establishments. For these reasons the deterrent influence of joblessness on property crime may only occur in more rural or suburban areas.

This pattern offers strong support to the suggestion that some of the indirect effects of industrial composition on crime rates, mediated by employment patterns, vary between urban and rural areas. Interactions involving the percentage urban and industrial composition, racial segregation, and community instability that could also be influential in predicting county crime rates were also explored (models not shown here). None of these interactions had a significant effect on either violent or property crime rates. This suggests that neither the direct effect of industrial composition nor the effects of the other mediating variables are influenced by the percentage of the population living in urban areas.

The role that the percentage urban plays in accentuating positive and decreasing negative relationships between weak labor market opportunities and crime implies that larger concentrations of individuals who are on the margins of the labor force are especially problematic. This is especially true in the case of violent crime. In more rural areas, unemployed individuals who contribute to high rates of joblessness may not come into regular contact with large numbers of others who are similarly positioned in the labor force. In more urban areas, concentrations of unemployed individuals are more likely to spend time together, increasing the availability of both accessible targets and motivated accomplices. This explanation is consistent with the research on segmented labor markets showing that individual unemployment is more conducive to violent criminal behavior in areas where there are large concentrations of unemployed or marginally employed individuals (Crutchfield and Pitchford 1997).

Much of the previous work in the areas of unemployment, marginal employment and crime at the aggregate level has been based on urban aggregates, usually specific cities or a sample of large SMSA's. While higher crime rates in urban areas tend to attract more research interest, it is important to model how these relationships differ in diverse demographic areas. The

current work adds clarification to when the relationships between labor force involvement and crime are more likely to exist.

Overall, the findings do not support a strictly economic interpretation of the relationship between work and crime. Joblessness, which is probably the best measure of weak labor force opportunity at the county level, increases violent crime in more urban areas but not in rural areas. It decreases property crime in rural areas, but has no effect on property crime in urban areas. If crime were simply another way to earn a living we would expect its influence to be more apparent when examining property crimes and to be constant across both urban and rural counties. Instead, joblessness may indicate a lack of social investment which when concentrated (more likely in urban areas) may lead to more expressive criminal behavior that does not depend on careful planning or unguarded targets.

High levels of part-time employment may encourage property crime by creating less social investment at the individual level and facilitate property crime by providing more targets. These forces are especially powerful in urban areas where guardianship is less influential and the distribution of stolen goods is easier. High levels of part-time employment appears to decrease violent crime. I suggested that this may be related to the age distribution of such behavior. Young males are most likely to participate in violent crime. They are also the most likely to be on the margins of the labor market. It may be that once joblessness is controlled, high levels of part-time employment allow them access to low level jobs from which they would otherwise be excluded. It is unclear why this is relationship appears primarily in rural areas.

The Underclass

While the two way interaction terms included in Models 2 and 3 address the question of whether or not the indirect effects of industrial composition are more pronounced in urban areas,

the three way interactions included in Models 4 and 5 add a racial component to this question. Wilson (1989, 1996) has argued that the de-industrialization process has been especially detrimental to African-American communities that are more susceptible to shifts in the availability of low-skilled, stable employment opportunities.

In order to empirically examine this claim, three way interaction terms measuring the multiplicative effects of percentage urban, percentage black, and labor force participation were added to the equations. Even while including the two-way interaction terms, the two variables representing the "underclass effect" were both significantly related to the rates of both property and violent crime. Just as the percent urban influences the relationship between labor force involvement and crime at the aggregate level, so too does the combination of labor force involvement, large percentages of blacks, and large percentages of urban dwellers. In other words, indicators of labor force participation, which are, in part, the result of industrial composition, are more likely to increase rates of violent and property crime in urban counties, and these relationships are even stronger in counties with large African-American populations.

Without including racially disaggragated crime and employment rates in the analysis there is no way to be sure that the communities most aggravated by these conditions are predominantly African-American. However these findings do offer tentative support to Wilson's argument concerning the detrimental effects of de-industrialization on urban, minority communities. While these effects are detrimental on all communities, their influence is magnified in areas with large black populations.

Summary and Conclusion

Together, these analyses answer a number of questions that have not been empirically examined in previous work. Most broadly, they suggest that aggregate variables measuring

community characteristics, such as unemployment, types of employment, social disorganization, and residential segregation, should not necessarily be treated as exogenous variables at the beginning of the causal process. By looking at the industrial composition of communities we are able to move farther up on the causal chain and identify the precursors to the more commonly studied aggregate-level community variables. In doing so, we deepen our understandings of the causes of both the intervening and the outcome variables. In this case, we see that, in addition to having direct effects on both violent and property crime rates, the ratio of retail to manufacturing sector jobs is directly detrimental to the aggregate-level labor force involvement and community stability within a county, and has both negative and positive indirect effects on residential segregation. Many of these community characteristics, either on their own or when interacting with the percentage of the population living in urban areas, tend to increase the rates of both violent and property crime.

In addition to lengthening the causal chain in research on employment, segregation, disorganization, and crime, the current work proposes that research involving the effects of industrial composition on crime should not be limited to focusing on the underclass or on violent crime. These analyses find that while the indirect effects of industrial composition, mediated by employment patterns, are strongest in urban areas, both the direct effects and those mediated by community instability and residential segregation are influential across urban and rural locales. In focusing only on urban areas, research examining the influence of macro-level processes leaves out an important part of the puzzle. Many of the relationships are substantively significant in either urban or rural areas, and often in opposite directions. This makes sense in that some of the suggested causal processes are highly dependent on the proportion of the population living in urban areas. The role that the urban/rural distinction plays in moderating macro-level effects should continue to be an empirical question not an unexamined assumption. The further

development of theoretical models that help explain the different processes relating labor force involvement to crime in rural and urban areas should be examined in future research

There is also some evidence that the mediating processes involving employment patterns is especially conducive to crime in counties with large African-American and urban populations. Thus the findings are supportive of both extending research on the effects of industrial composition beyond traditionally targeted groups and areas and the claim that certain groups are more likely to be negatively affected by de-industrialization and other macro-economic shifts which alter the opportunity structures for less educated individuals.

These findings agree with much of the work that has examined the influence of unemployment (Sampson 1987; Crutchfield 1989) and disadvantage (Krivo and Peterson 1996) on violent crime. Much of this work has adopted a structural perspective proposing that individual motivations may interact with the opportunities and limitations embedded in the social structure of the environment. This type of interpretation can help make sense of the counter intuitive finding that joblessness can increase violent crime and decrease property crime, and that these effects will vary across urban and rural counties. The findings offer less support to the body of literature suggesting a positive relationship between unemployment and property crime (Chiricos 1987). Chiricos suggested that this relationship would be more likely in analyses including smaller areas as the units of analysis. As the current study uses counties, this may explain some of the discrepancy. However, this contradiction does call into question the strictly economic interpretation often used to explain observed relationships between employment and crime.

One of the major weaknesses of aggregate-level research is that there is no way to determine whether the causal processes linking concepts is occurring at the individual or aggregate level. As discussed in Chapter 1, aggregate relationships may be the result of aggregate

forces somewhat independent of the individual circumstances of individuals in the area, or they may be the result of a set of individual processes which when combined look like an aggregate effect. The processes related to both motivation and opportunity used to explain the relationships between industrial composition, labor force participation, and crime had both individual and contextual aspects. The increased availability of targets for property crime provided by high levels of retail industry could be interpreted as a contextual effect if it increases targets for the whole population, or individual if it only increases the targets for those working in the retail industry. The perception of weak opportunities increased by high rates of joblessness may influence all individuals, or it may only influence those individuals who are unemployed.

In Chapter 4, I examine these relationships at the individual level. I ask whether individuals' employment experiences influence their participation in violent and property crime. This will determine whether individual-level causal processes may be driving some or all of the aggregate-level relationships observed in this chapter. If these relationships are not found at the individual-level, it suggests the likelihood of contextual-level effects. In Chapter 5, I use multi-level modeling techniques to parcel out the role of individual and contextual-level processes.

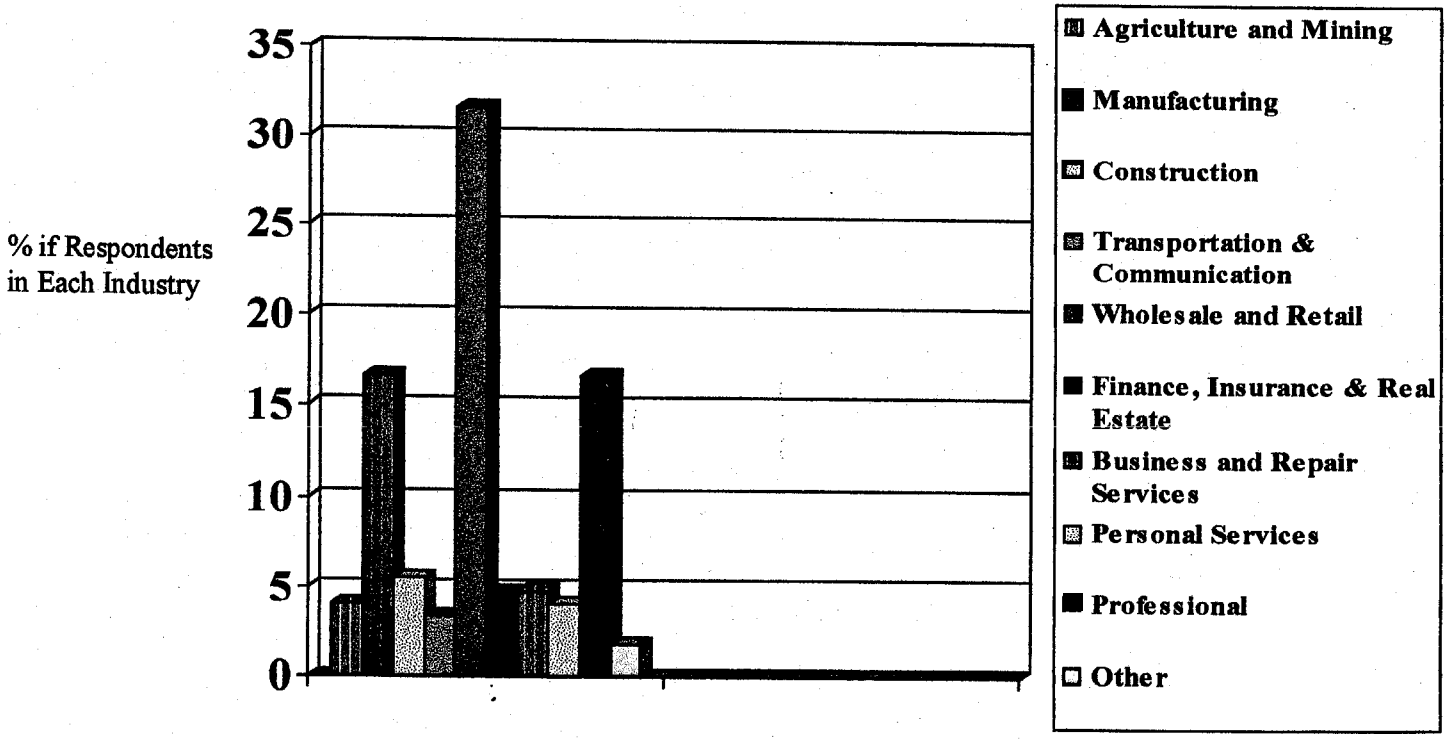


Figure 3-1 Industry Involvement of1979 NLSY Respondents age 18 and Over

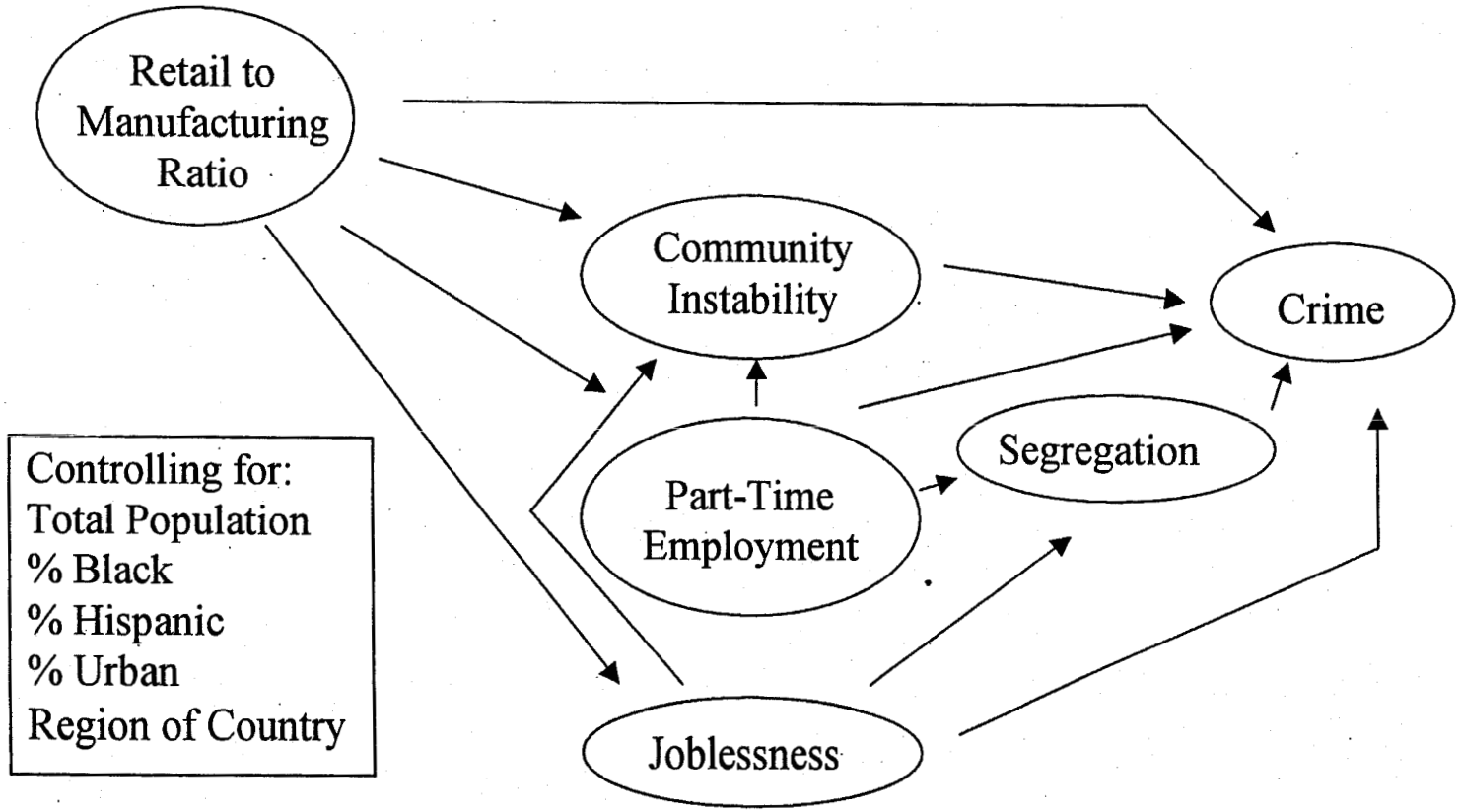


Figure 3-2 Path Diagram of Aggregate Model

Table 3-1

Variable Names, Descriptions and Descriptive Statistics For County Level Variables – U.S. Census and Uniform Crime Reports

		Counties in NLSY		All Counties in U.S.	
Independent Variables	**Variable Description**	**Mean**	**S.D.**	**Mean**	**S.D.**
Industrial Composition	Ratio of Retail to Manufacturing Industry Jobs	1.036	.996	1.523	2.544
Percent Urban	Percentage of the Population Living in Urban Areas	.418	.405	.127	.285
Percent Black	Percentage of the Population that is black	.104	.136	.086	.144
Percent Hispanic	Percentage of the Population that is Hispanic	.040	.091	.037	.101
Northeast	1=County is in Northeast, 0= Not in Northeast	.165	N/A	.07	N/A
North Central	1=County in North Central, 0= Not in North Central	.299	N/A	.33	N/A
South	1=County is in South, 0= Not in South	.408	N/A	.44	N/A
West	1=County is in West, 0= Not in West	.127	N/A	.14	N/A
Mediating Variables					
Percent Joblessness	Percentage of the Population not working	.440	.066	.458	.068
Percent Part-Time	Percentage of the labor force working 35+ hours per week, for 49+ weeks per year	.386	.064	.386	.055
Disorganization/Instability	A factor of the percentage divorced and the percentage that has moved in the last year	-.125	.97	.001	1.00
Segregation	Index of dissimilarity score	.547	.165	-------	-------

Continued on next page

Table 3-1 Continued

Interaction Terms					
% Urb * Jobless		.175	.172	.052	.116
% Urb * % Part-time		.155	.152	.046	.105
% Urb * % Black * Jobless		.024	.045	.006	.023
% Urb * % Black * % P-time		.019	.036	.005	.019
Dependent Variables					
Violent Crime Rate	Violent Crimes per 100,000 people	384	356	242	275
Property Crime Rate	Property Crimes per 100,000 people	4473	2161	3001	2122

Table 3-2

Correlation Matrix of Variables Included in County-Level Analysis
N=545

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
V1 Property Crime	1.000									
V2 Violent Crime	.264***	1.000								
V3 Industrial Composition	.174***	-.031	1.000							
V4 % Jobless	-.301***	-.023	0.082	1.000						
V5 % Part-time	-.042	-.101*	.308***	.343***	1.000					
V6 Disorganization	.659***	.099*	.299***	-.228***	.084*	1.000				
V7 Segregation	.324***	.211***	-.062	-.075	-.192***	0.059	1.000			
V8 Total 1980 Pop	.311***	.885***	-0.071	-.144***	-.165***	.150***	.270***	1.000		
V9 % Black	.220***	.167***	-.098*	.181***	-.170***	-.022	0.051	.124**	1.000	
V10 % Hispanic	.208***	.166***	.136***	0.034	0.015	.160***	0.001	.184***	-.066	1.000
V11 % Urban	.679***	.268***	-.017	-.344**	-.245***	.431***	.448***	.426***	.194***	.154***
V12 West	.304***	0.077	.348***	-.109*	.126**	.516***	-.138***	.130**	-.204***	.303***
V13 North-Central	-.059	-.055	-.042	-.103*	.156***	-.085*	.135**	-.046	-.281***	-.197***
V14 Northeast	-.074	0.075	-.189***	-.043	-.090*	-.352***	.137***	.117**	-.140***	-.045
V15 South	-.097*	-.058	-.053	.202***	-.163***	-.004	-.136**	-.134**	.507***	0.012
V16 % Urban * % Jobless	.669***	.282**	-.002	-.200***	-.211***	.410***	.456***	.413***	.235***	.170***
V17 % Urban * % Part-time	.682***	.245***	0.013	-.308***	-.118**	.446***	.424***	.391***	.163***	.152***
V18 % Urb * %Black * %Jobless	.504***	.319***	-.006	0.041	-.204***	.216***	.368***	.309***	.630***	0.018
V19 % Urb * % Black * % P-time	.537***	.308***	0.000	-.014	-.179***	.240***	.377***	.311***	.628***	0.013

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

Continued on next page

Table 3-2 Continued

	V11	V12	V13	V14	V15	V16	V17	V18	V19
V1 Property Crime									
V2 Violent Crime									
V3 Industrial Composition									
V4 % Jobless									
V5 % Part-time									
V6 Disorganization									
V7 Segregation									
V8 Total 1980 Pop									
V9 % Black									
V10 % Hispanic									
V11 % Urban	1.000								
V12 West	.126**	1.000							
V13 North-Central	-.707	-.249***	1.000						
V14 Northeast	0.107	-.171***	-.291***	1.000					
V15 South	-.101*	-.315***	-.543***	-.370***	1.000				
V16 % Urban * % Jobless	.978***	.113**	-.093*	.113**	-.075	1.000			
V17 % Urban * % Part-time	.980***	.145***	-.048	.093*	-.124**	.968***	1.000		
V18 % Urb * %Black * %Jobless	.589***	-.117**	-.143***	-.013	.222***	.653***	.553***	1.000	
V19 % Urb * % Black * % P-time	.612***	-.113**	-.140***	-.021	.223***	.659***	.586***	.988***	1.000

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

Table 3-3

Unstandardized Coefficients, Standard Errors (in parentheses), and Standardized Coefficients (in italics) for Multiple Regression Analyses of County Crime Rates on Industrial Composition and other County Characteristics
N=538

	Violent Crime	Property Crime
Industrial Composition	26.207** (10.911) *.074*	259.425*** (67.35) *.120*
Total Population	.000118*** (.000) *.190*	-.000051 (.000) *-.014*
Percent Black	1256.20*** (92.561) *.480*	3324.09*** (571.33) *.210*
Percent Hispanic	397.09*** (122.79) *.100*	1864.36** (757.97) *.078*
Percent Urban	328.87*** (28.65) *.371*	3305.86*** (176.86) *.615*
West	112.06** (42.01) *.104*	1463.26*** (259.31) .225
North-Central	8.327 (31.871) *.011*	506.20** (196.722) *.107*
South	-22.215 (33.935) *-.030*	-77.396 (209.461) *-.017*
Constant	37.248 (29.447)	2112.964 (181.764
R Square	.577	.561

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

Table 3-4

Unstandardized Coefficients, Standard Errors (in parentheses), and Standardized Coefficients (in italics) for Regression Analysis of Mediating Variables on Industrial Composition and Other County Characteristics
N=545

	Joblessness	Part-Time Work	Instability	Segregation	Segregation Model 2
Industrial Composition	.008** (.003) *.118*	.017*** (.023) *.272*	.112*** (.031) *.114*	.012 (.006) *.072*	.015* (.007) *.089*
Total Population (increments of 100,000)	-.001 (.000) *-.012*	-.001 (.000) *-.071*	-.001 (.000) *-.013*	. 001** (.000) *.132*	. 001** (.000) *.123*
Percent Black	.126*** (.023) *.259*	.038 (.023) *.008*	-.981*** (.260) *-.137*	-.049 (.053) *-.040*	-.104* (.054) *-.086*
Percent Hispanic	.0873** (.030) *.120*	.0226 (.030) *.032*	-.795** (.342) *-.074*	-.015 (.070) *-.008*	-.044 (.069) *-.024*
Percent Urban	-.066*** (.007) *-.404*	-.037*** (.007) *-.232*	1.130*** (.081) *.470*	.189*** (.017) *.463*	.201*** (.020) *.492*
West	-.024* (.010) *-.120*	.011 (.010) *.056*	1.942*** (.118) *.660*	-.120*** (.024) *-.241*	-.113*** (.029) *-.226*
North-Central	-.013 (.008) *-.089*	.016* (.008) *.112*	.732*** (.090) *.513*	.016 (.018) *.045*	.026 (.019) *.071*
South	-.007 (.008) *-.054*	-.014 (.008) *-.108*	1.021*** (.094) *.513*	-.048** (.019) *-.141*	-.054* (.021) *-.161*
Percent Jobless					.487*** (.105) *.196*
Percent Part-Time					-.408*** (.108) *-.159*
Constant	.453 (.007)	.384 (.007)	-1.457 (.083)	.482 (.017)	.425 (.055)
R Square	.213	.194	.536	.320	.353

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

Table 3-5

Unstandardized Coefficients, Standard Errors (in parentheses), and Standard Coefficients (in italics) for Regression of Violent Crime on Industrial Composition, Labor Force Participation, and Other County Characteristics^

N=538

	Violent Crime Model 1	Violent Crime Model 2	Violent Crime Model 3	Violent Crime Model 4	Violent Crime Model 5
Industrial Composition	18.49 (10.96) *.052*	16.31 (10.76) *.046*	19.87 (10.99) *.056*	9.10 (10.37) *.026*	10.48 (10.31) *.029*
Joblessness	360.213* (179.66) *.067*	-358.31 (234.75) *-.066*	361.83* (179.49) *.067*	-151.67 (227.07) *-.028*	245.41 (168.01) *.046*
Part-Time Work	-492.63** (183.40) *-089*	-406.11* (180.89) *-.073*	-679.71** (224.83) *-.122*	-358.61* (173.57) *-.064*	-717.74*** (209.86) *-.129*
Instability	105.10*** (14.80) *.286*	101.08*** (14.55) *.275*	106.04*** (14.80) *.289*	89.23*** (14.05) *.243*	89.12*** (13.94) *.243*
Segregation	199.00** (72.95) *.091*	194.63** (71.57) *.089*	199.29** (72.88) *.092*	104.38 (69.87) *.048*	71.35 (69.52) *.033*
Total Population	.00011*** (.000) *.177*	.00012*** (.000) *.183*	.00011*** (.000) *.183*	.00010*** (.000) *.162*	.00010*** (.000) *.166*
Percent Black	1323.37*** (91.75) *.506*	1297.75*** (90.18) *.496*	1333.12*** (91.91) *.510*	877.96*** (105.92) *.336*	801.16 (104.65) *.306*
Percent Hispanic	470.79*** (118.02) *.119*	449.07*** (115.88) *.113*	474.33*** (117.93) *.120*	502.26*** (111.37) *.127*	517.26*** (110.16) *.131*
Percent Urban	175.49*** (36.72) *.198*	-571.27*** (165.12) *-.644*	-52.24 (162.81) *-.059*	-219.56 (166.40) *-.248*	-213.25 (153.02) *-.240*
*Urban*Jobless*	---	1732.86*** (373.92) *.827*	---	641.07 (392.23) *.306*	---
*Urban*Pt-time*	---	---	589.11 (410.34) *.249*	---	632.18 (382.96) *.267*
*Urban*Jobless*% Black*	---	---	---	2622.64*** (382.28) *.329*	---
*Urban*Pt-time*% Black*	---	---	---	---	3948.53*** (445.11) *.393*
Constant	123.37 (96.91)	410.88 (113.52)	196.93 (109.53)	381.35 (108.92)	371.19 (104.09)
R Square	.623	.638	.625	.668	.674

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

^ Region of the country was removed from the table in order to fit table to page. Tables with region are available in Appendix 3-A.

Table 3-6

Unstandardized Coefficients, Standard Errors (in parentheses), and Standardized Coefficients (in italics) for Regression of Property Crime on Industrial Composition, Labor Force Participation, and Other County Characteristics^

N=538

	Property Crime Model 1	Property Crime Model 2	Property Crime Model 3	Property Crime Model 4	Property Crime Model 5
Industrial Composition	116.64*	108.41	126.40*	95.81	103.54
	(58.33)	(57.86)	(58.41)	(57.97)	(57.96)
	.054	.050	*.059*	*.044*	*.048*
Joblessness	-4624.81***	-7334.33***	-4613.37***	-6973.28***	-4896.88***
	(956.37)	(1262.29)	(953.98)	(1269.19)	(944.58)
	-.142	*-.224*	*-.141*	*-.213*	*-.150*
Part-Time Work	2419.94*	2746.22**	1095.95	2829.22**	1003.33
	(976.28)	(972.70)	(1194.98)	(970.15)	(1179.84)
	.072	*.081*	*.033*	*.084*	*.030*
Instability	1097.94***	1082.79***	1104.60***	1062.07***	1063.39***
	(78.78)	(78.21)	(78.66)	(78.54)	(78.38)
	.493	*.486*	*.496*	*.477*	*.478*
Segregation	1829.71***	1813.22***	1831.76***	1655.52***	1520.17***
	(388.32)	(384.86)	(387.34)	(390.53)	(390.86)
	.139	*.137*	*.139*	*.126*	*.115*
Total Population	-.00006	-.00005	-.00004	-.00008	-.00006
	(.000)	(.000)	(.000)	(.000)	(.000)
	-.018	*-.014*	*-.010*	*-.020*	-.017
Percent Black	4991.99***	4895.38***	5061.00***	4161.88***	3765.52***
	(488.39)	(484.91)	(488.49)	(592.04)	(588.37)
	.315	*.309*	*.319*	*.263*	*.238*
Percent Hispanic	3097.28***	3015.38***	3122.32***	3108.32***	3226.87***
	(628.24)	(623.10)	(626.79)	(622.48)	(619.32)
	.129	*.126*	*.130*	*.129*	*.134*
Percent Urban	1462.85***	-1353.11	-148.90	-738.59	-541.01
	(195.47)	(887.86)	(865.35)	(930.07)	(860.28)
	.272	*-.252*	*-.028*	*-.137*	*-.101*
*Urban*Jobless*	---	6534.50***	---	4626.86*	---
		(2010.67)		(2192.35)	
		.515		*.364*	
*Urban*Pt-time*	---	---	4169.37*	---	1003.33
			(2180.98)		(1179.84)
			.291		*.030*
*Urban*Jobless*% Black*	---	---	---	4582.44*	---
				(2136.73)	
				.095	
*Urban*Pt-time*% Black*	---	---	---	---	9615.78***
					(2502.45)
					.158
Constant	4009.94	5094.13	4530.57	5042.53	4954.95
	(515.84)	(610.43)	(582.17)	(608.82)	(585.19)
R Square	.710	.715	.712	.718	.719

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

^ Region of the country was removed from the table in order to fit table to page. Tables with region are available in Appendix 3-A.

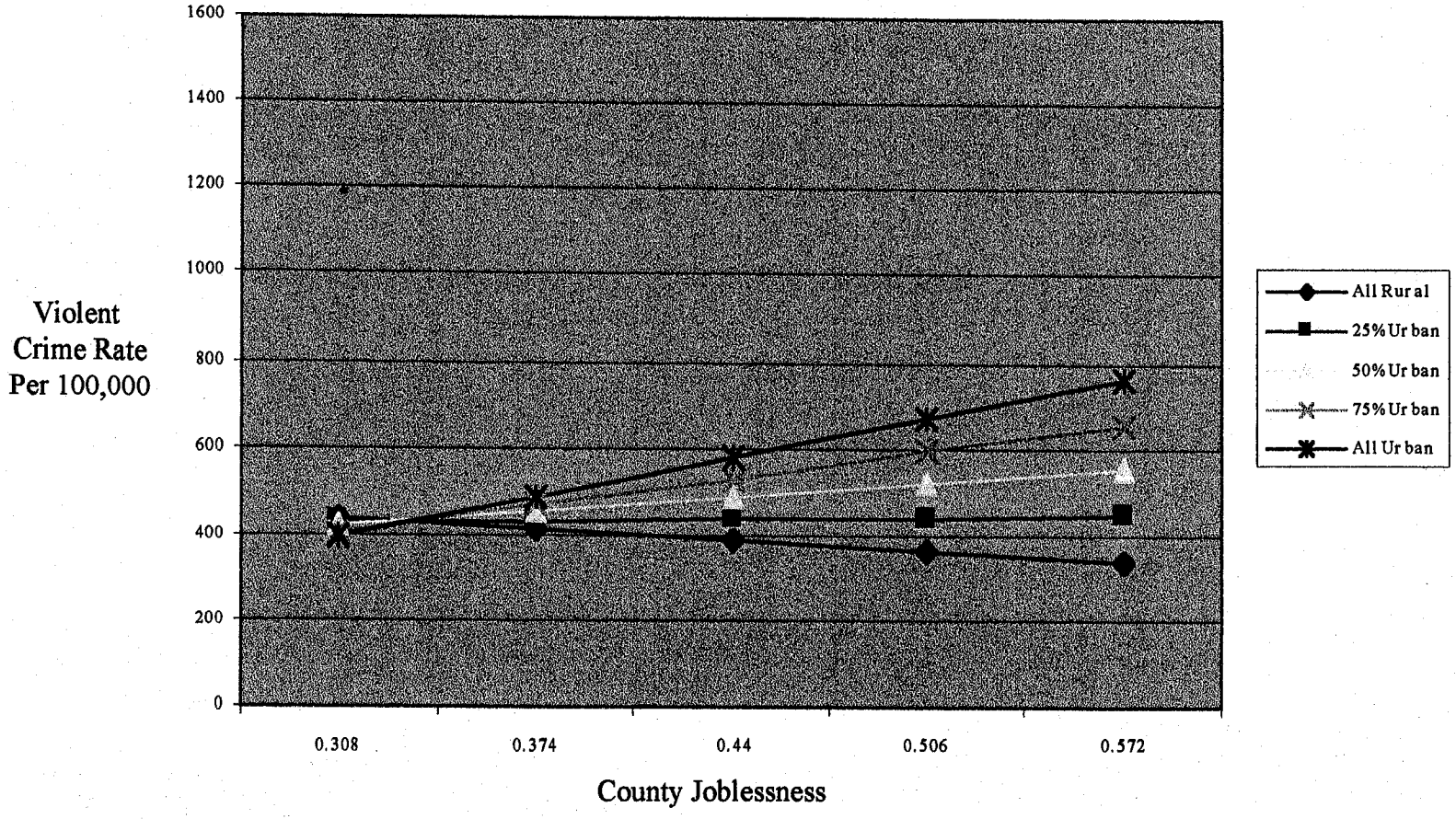


Figure 3-3 Violent Crime Rates by Urbanization and Joblessness

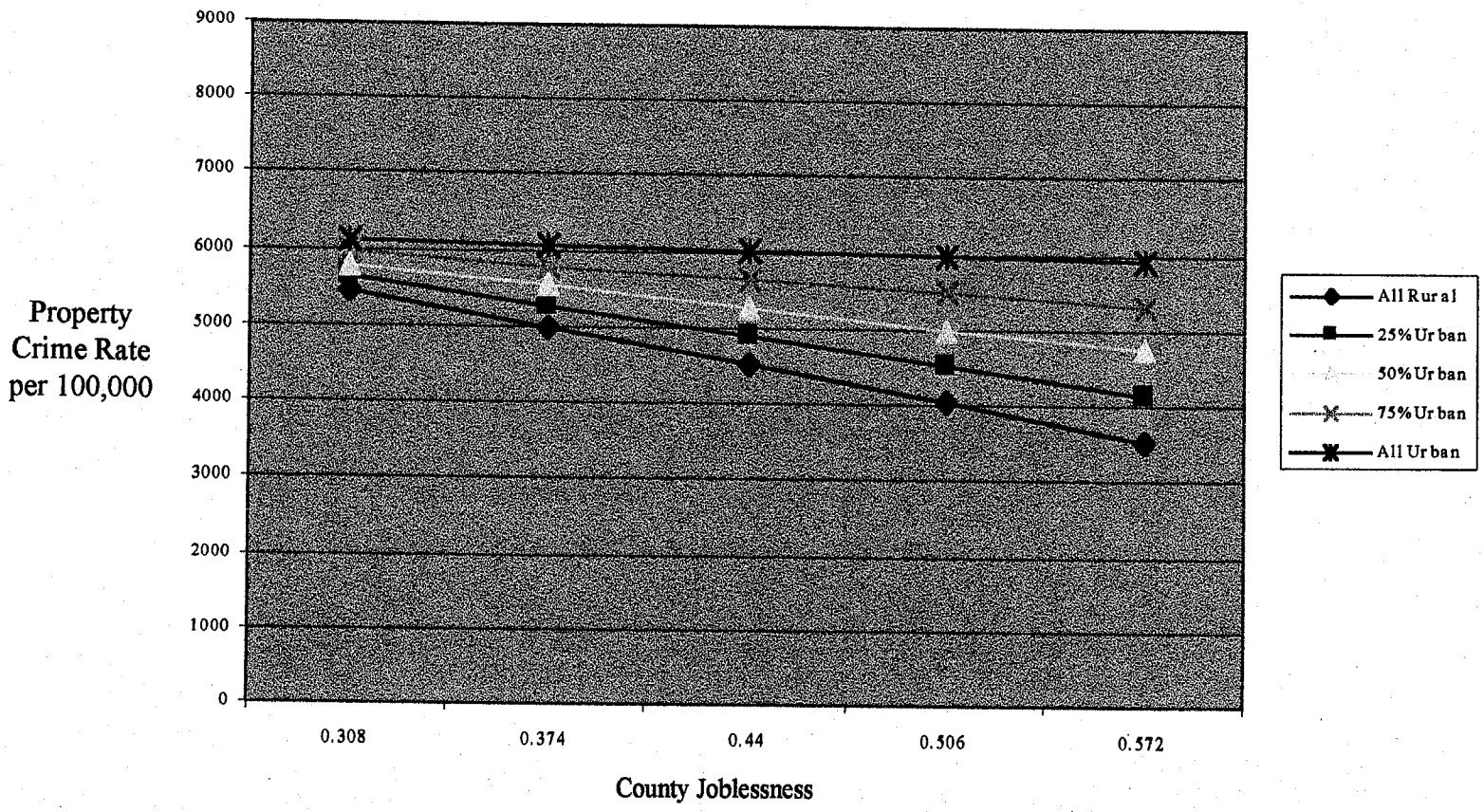


Figure 3-4 Property Crime Rates by Urbanization and Joblessness

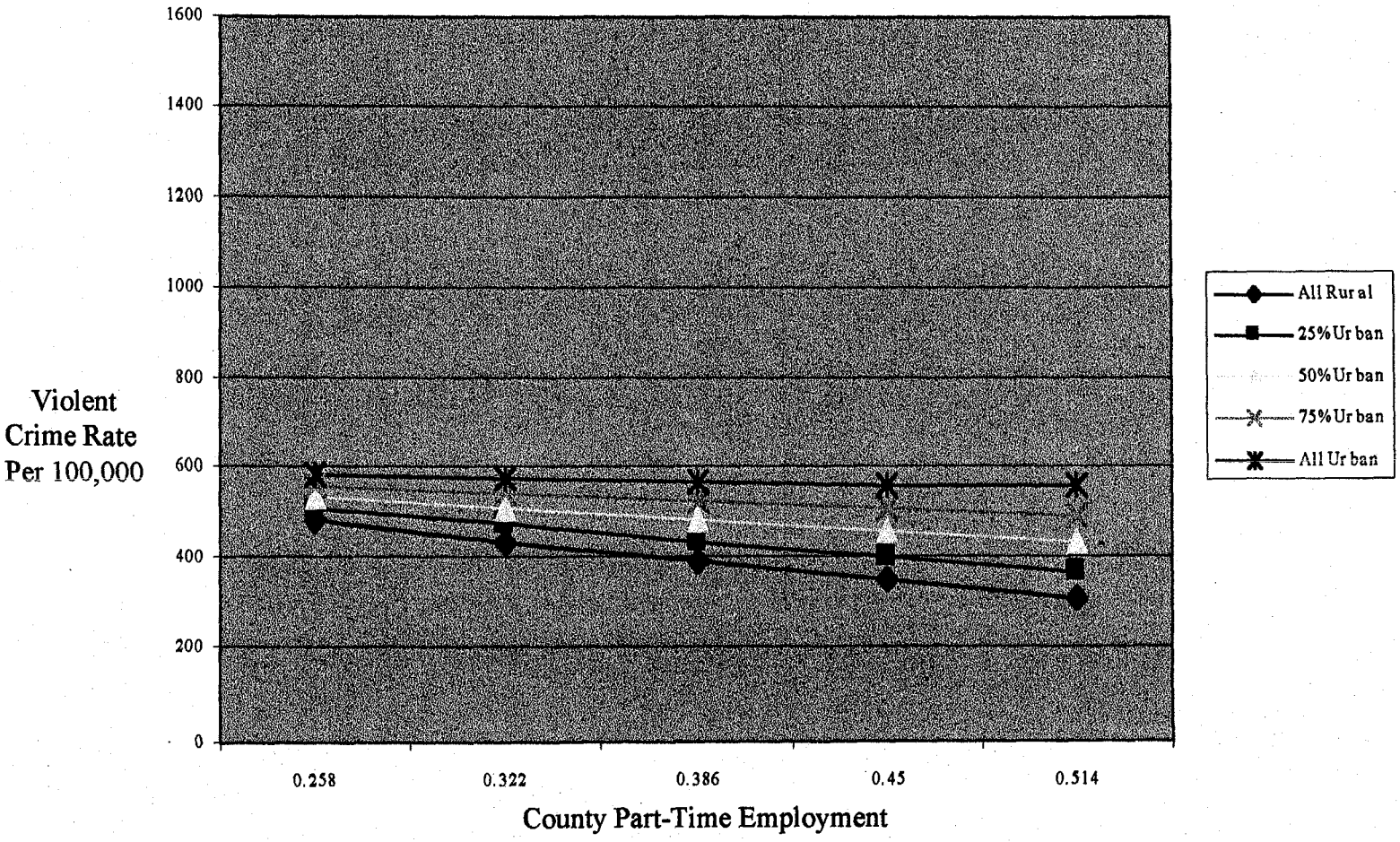


Figure 3-5 Violent Crime Rate by Part-Time Employment and Urbanization

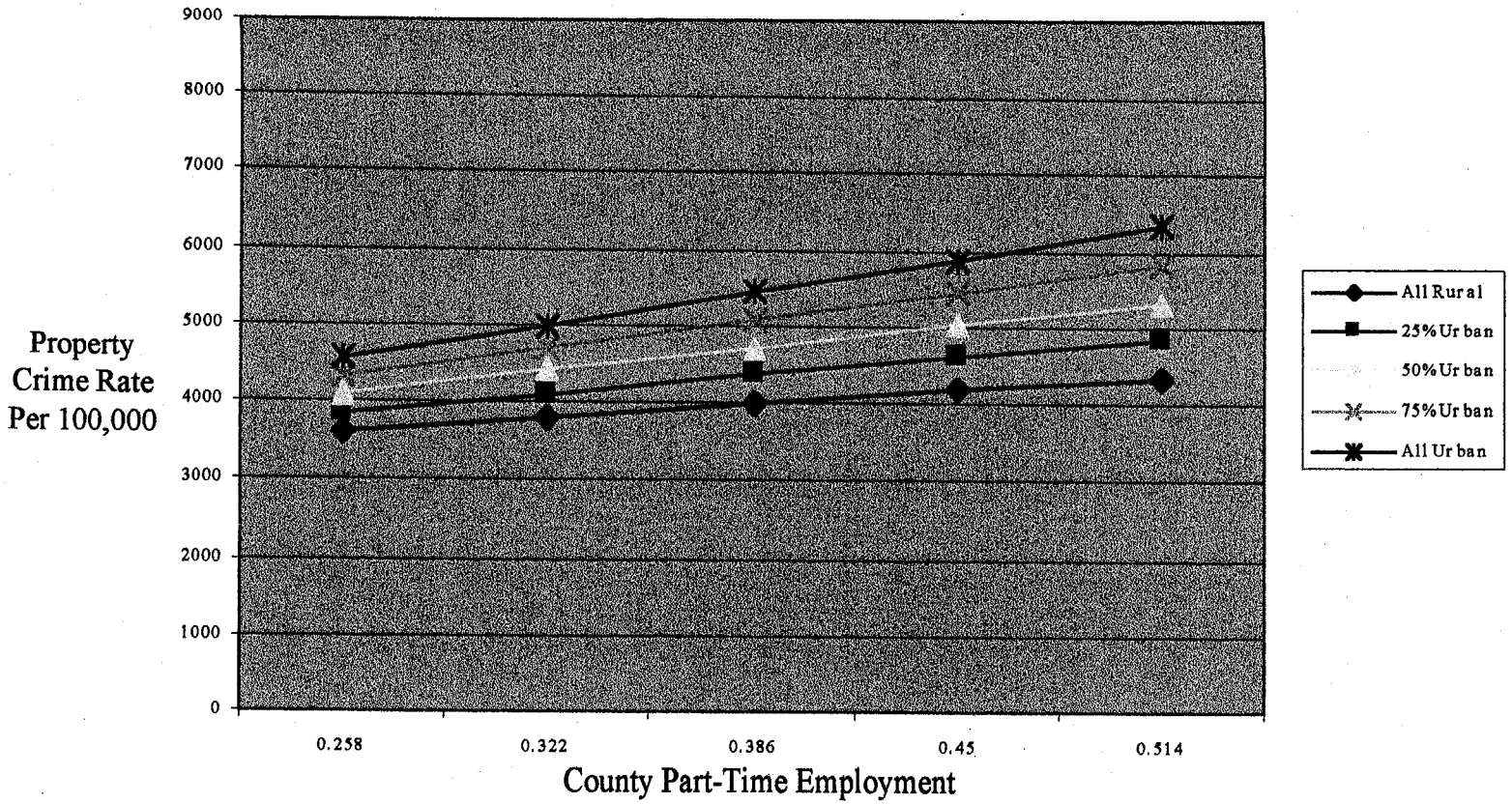
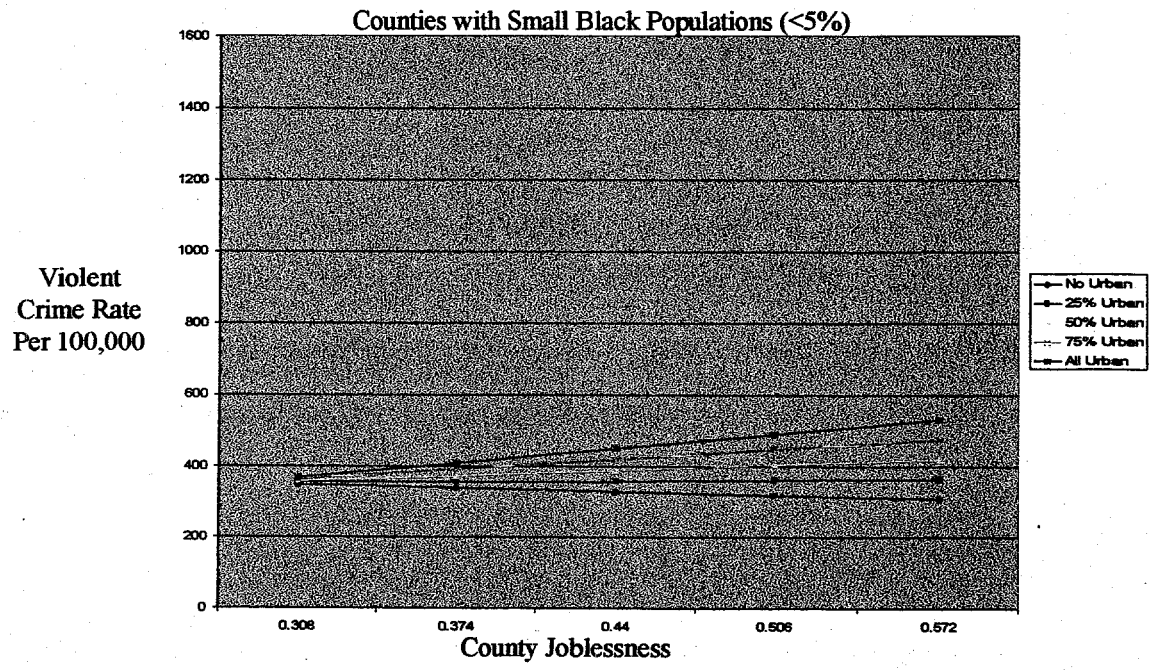


Figure 3-6 Property Crime Rates by Part-Time Employment and Urbanization



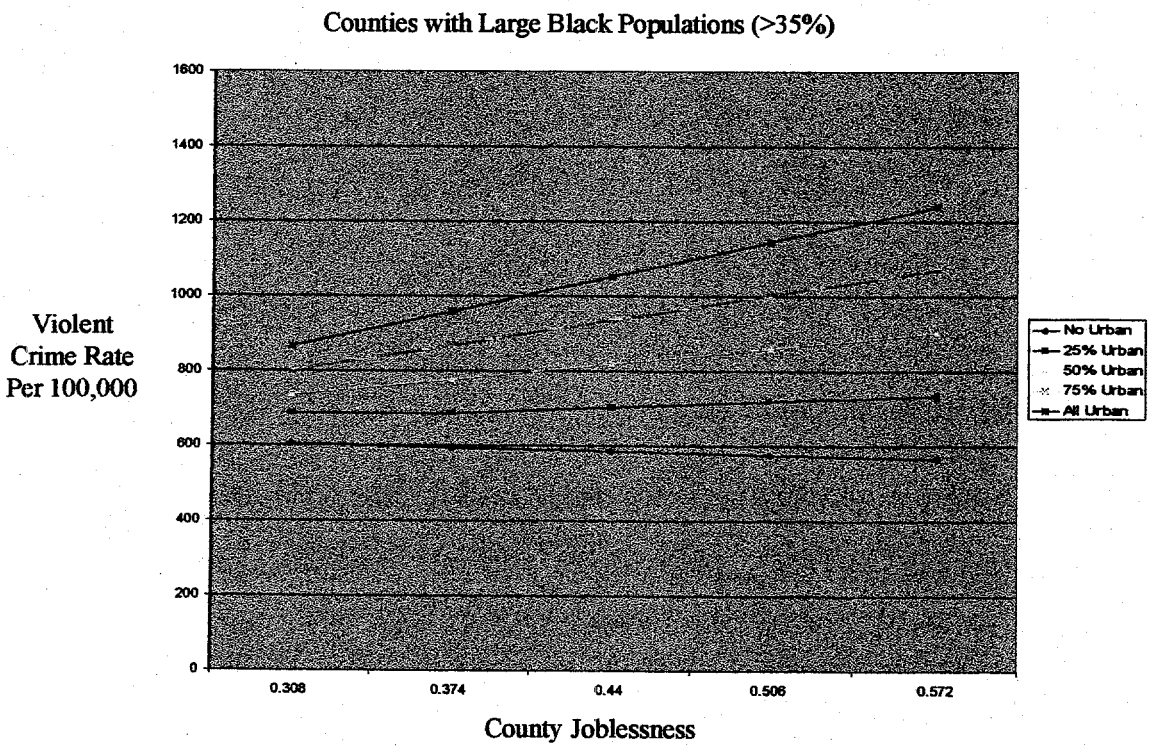


Figure 3-7 Violent Crime Rates by Joblessness and Urbanization

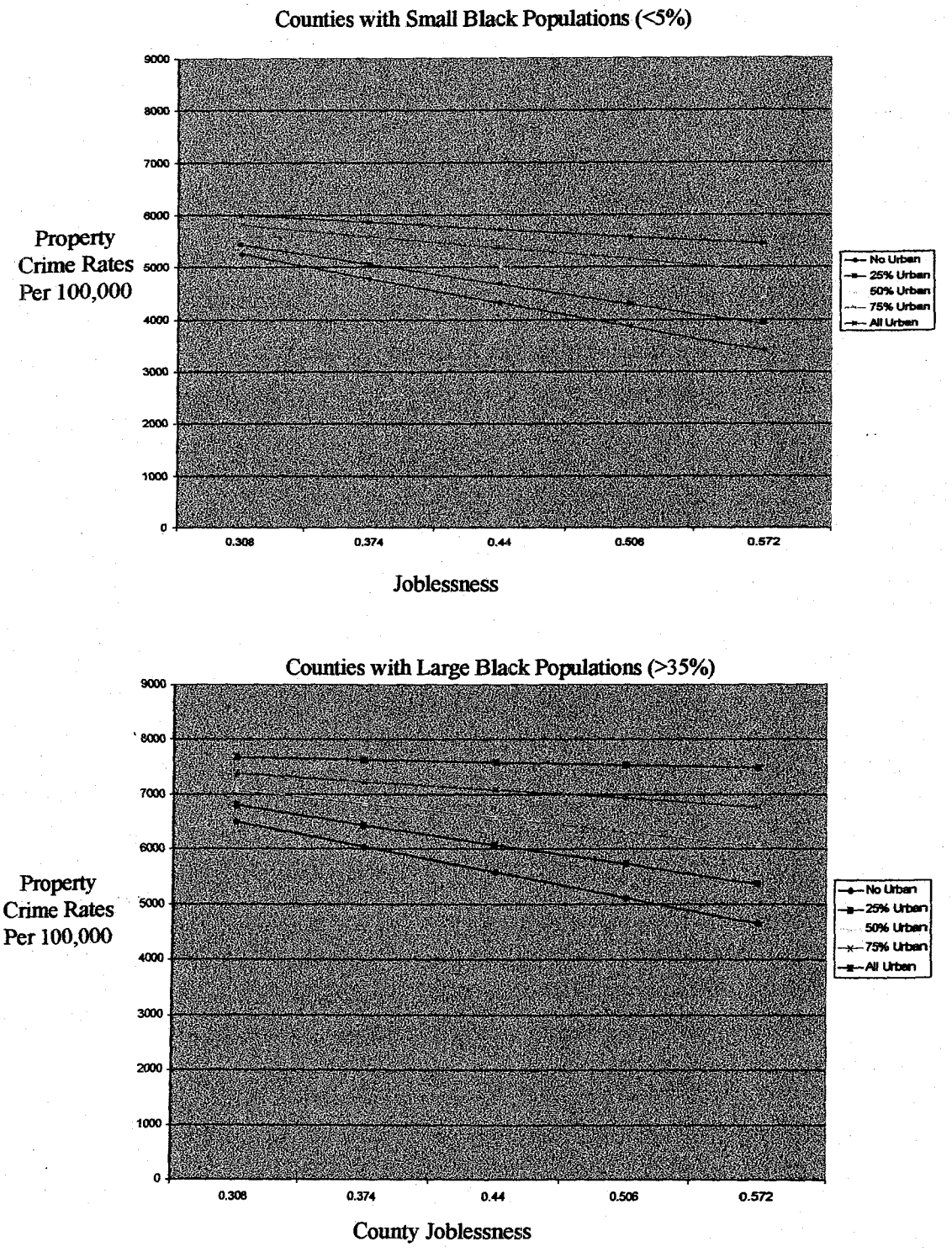


Figure 3-8 Property Crime Rates by Joblessness and Urbanization

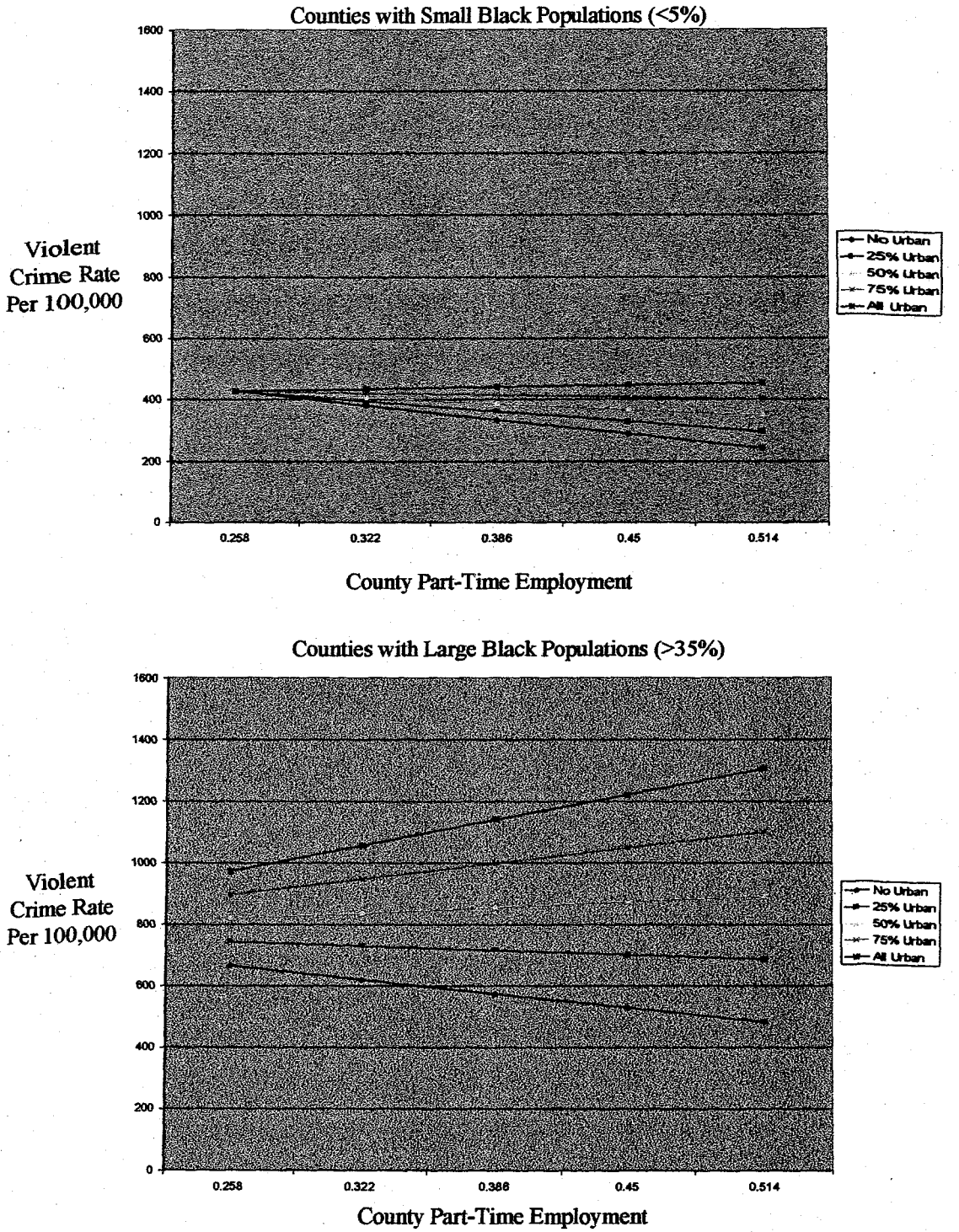


Figure 3-9 Violent Crime Rates by Part-Time Employment and Urbanization

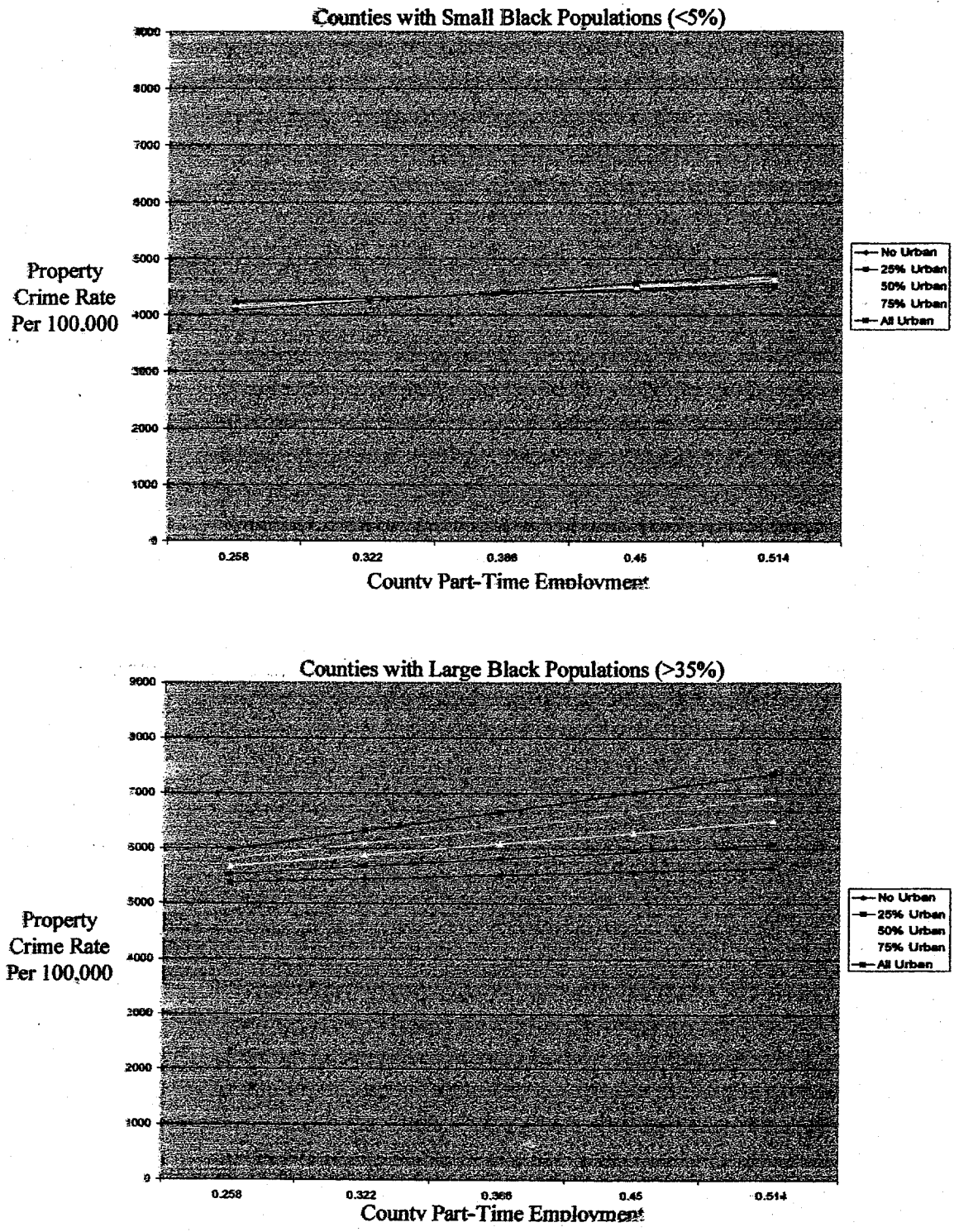


Figure 3-10 Property Crimes Rates by Part-Time Employment and Urbanization

Chapter 4:

Employment, Investments, and Participation in Crime

Chapter 3 showed that industrial composition influences patterns of labor force involvement, social organization, and residential segregation. In turn, these characteristics at the county level were related to aggregate crime rates. These relationships were stronger and more consistently positive in urban areas and even more so in urban areas with large black populations. As discussed in Chapter 1, explanations for aggregate relationships between employment and crime have drawn on both individual and macro-level causal processes. However, when only aggregate data is used in the analysis, there is no way to determine which of these levels of explanation better represents the observed relationship.

Using NLSY respondents from the counties included in the aggregate analysis in Chapter 3, this chapter focuses on whether individual-level employment influences involvement in criminal behavior. It examines whether individuals' employment statuses, as well as the characteristics and quality of their employment has an effect on their participation in violent and property related crime. The individual-level analysis sheds light on a number of issues. First, it addresses whether individual-level causal mechanisms can be used to explain the aggregate-level relationships found in Chapter 3. Second, it explores the conceptualization of employment and how our treatment of work can further our understanding of the causal mechanisms relating work and crime. Lastly, it examines whether the effect of work on crime will vary across different types of offenses.

Individual Mechanisms

If the finding that employment patterns at the aggregate level influence county crime rates is the result of individual-level relationships between employment and crime, then this process should be observable when examining individual-level data. If they are not present in the individual-level analysis, than we must believe that some other process is driving the aggregate-level relationship. It is also possible that part of the aggregate relationship can be explained by individual-level relationships aggregated up to (in this case) the county level, and part of the relationship is due to contextual effects. This analysis allows us to determine whether at least part of the relationship can be explained through individual-level causal mechanisms. Chapter 5 will examine the individual and aggregate data together to explore the relative influence of the different factors explaining the relationship between work and crime.

Conceptualizing Employment

One of the central issues for studying the relationship between work and crime at the individual level has been the conceptualization of work. In past research, indicators including wages (Grogger 1998), stability of employment (Sampson and Laub 1990; Crutchfield and Pitchford 1997), current employment status (Kohfield and Sprague 1988) and level of labor market participation in a given time period (Witte and Tauchen 1994; Crutchfield and Pitchford 1997; Thornberry and Christenson 1984), occupational sector (Uggen 1999; Crutchfield and Pitchford 1997), work habits, and occupational aspirations (Sampson and Laub 1990) have been used to measure "employment". While indicators are often selected based on data availability, these choices lead to assumptions concerning the causal process by which work influences crime.

The most accurate or appropriate way to conceptualize work in exploring its relationship to crime depends on the theoretical mechanism that is expected to drive the relationship.

Conjectures or ideas concerning this mechanism or process often stem from assumptions as to why people work and why people commit crime. In strictly economic models predicting criminal behavior, for instance, employment is often conceptualized primarily as the pathway to a paycheck with crime viewed as an alternative pathway or shortcut (Becker 1969; Grogger 1998). Given this theoretical assumption, using indicators of employment such as income, hours worked, or wages to conceptualize work may be quite useful. These measures are apt to be reasonable measures of how successful individuals are at receiving financial compensation in the labor market.

However, if the theoretical mechanism by which we expect work and crime to be correlated is not directly related to monetary gains, a different conceptualization of work may be more appropriate. If the influence of work on crime is expected to stem from how and where the respondent spends their time (Witte and Tauchen 1994; Crutchfield and Pitchford 1997) or with the frustration of labor market failure (Merton 1938; Cloward and Ohlin 1960), then measures of activity patterns and subjective evaluations of labor market rewards may better capture the theoretical mechanisms through which work influences crime.

In 1969, Hirschi proposed a version of social control theory aimed at explaining adolescent delinquency (1969). He proposed that there were four bonds to conformity (attachment to family, commitment to school, belief in the moral validity of norms, and involvement in conventional activities) that would act as informal deterrents to delinquent behavior. In the years since he presented his theory, numerous researchers and theorists (Sampson and Laub 1993; Crutchfield 1989; Crutchfield and Pitchford 1997; Uggen 2000) have suggested that it can be useful in explaining adult crime and deviance as well. While the specific indicators of the bonds to conformity will vary across the life course, using these bonds to explain anti-social or illegal behavior is not restricted to adolescents.

Sampson and Laub (1990) argued that the investments adults make in "conventional lines of activity" (Briar and Piliavin 1965) provide informal social controls that deter deviant or criminal behavior. In the language of Hirschi's social control theory, those who have developed these attachments or commitments have "stakes in conformity" (Hirschi 1969; Toby 1957). These stakes could be lost if the individuals participate in illegal behavior and are detected. Over the last decade, a number of sociologists have suggested that this is a useful framework in which to understand the relationship between work and crime (Sampson and Laub 1990, 1993; Crutchfield and Pitchford 1997; Uggen 1999). Individuals who have jobs that are rewarding on some level or who are well compensated for their work are more likely to feel some sense of investment in their job or career.

One of the challenges in this line of research has been appropriately conceptualizing employment in a fashion that addresses its deterrent abilities. Drawing directly from Hirschi's (1969) discussion of informal social control and Briar and Piliavin's focus on "commitment to conventional lines of activity " (1965), commitment as it relates to employment has often served as a guide to conceptualizing employment in empirical approaches (Crutchfield and Pitchford 1997; Wadsworth 2000). Sampson and Laub suggest that it "is the *social investment* or social capital (Coleman 1988) in the institutional relationship... that dictates the salience of informal social control at the individual level" (Sampson and Laub 1993 pg. 611). Those who are less attached to their jobs or who have no jobs at all have no investment in the institutional relationship of employment. They are more likely to feel that they have less to lose and are therefore more likely to participate in risky or illegal behavior. Sampson and Laub use the term "investment" to include a number of aspects about employment that represent "opportunity costs." While they include "commitment" as one of these elements, they use the term "investment" in a manner very consistent with Hirschi's use of the term "commitment."

Investments, Employment, and Crime

While income and other material rewards may certainly influence the degree to which an individual feels invested in their work, conceptualizing employment as an investment that has the power to deter illegal behavior suggests that the influence of employment reaches beyond its economic component. Work does more than just pay the bills and put food on the table. It can provide a sense of involvement in a larger organization, impart a sense of accomplishment, determine and routinize patterns of activity, offer goals and rewards (both financial and emotional), create friendship and peer networks among co-workers, and provide a sense of stability and security. The degree to which a job is able to offer these things to an employee is apt to be highly correlated with the workers' feeling of investment in their job. Those who experience this sense of investment and do not wish to lose the rewards of employment are less likely to take risks involving illegal behavior.

In their work with the Gluek data (Gluek and Gluek 1950), Sampson and Laub (1990, 1993) used indicators of occupational aspiration to create a scale that was used to measure commitment to employment. They also used measures of job stability, and employment status. Together, these represented a respondent's investment in employment. Crutchfield and Pitchford (1997) used job stability, as well as occupational sector as a proxy for job quality. Wadsworth (2000) used duration of employment and type of compensation as indicators of occupational investment. While the techniques vary, all of these approaches are trying to measure the same psychological process; the degree to which an individual feels that they are being, or will be in the future, materially or psychically rewarded for their employment. It is these rewards that create a sense of investment that, holding other thing constant, is expected to deter criminal behavior.

As mentioned above, the rewards of employment which encourage the development of a sense of investment can be lost. If individuals violate strongly held norms or laws and are detected, jobs or opportunities may be lost. In addition to sacrificing ones current rewards, getting in trouble may lead to a situation in which an individual also loses future opportunities and rewards. If illegal behavior leads to incarceration then both time out of the labor force and the social stigma attached to being an ex-convict may severely limit future labor market opportunities. Through this process, investments in work can deter criminal behavior the same way commitment to school and attachment to family has been shown to deter delinquency among children and adolescents (Hirschi 1969; Wadsworth 2000).

Findings from previous research offer support to the view that investments are important elements of the causal process that connects work and crime. Uggen (1999) found that indicators of occupational sector (a proxy for job quality) were inversely correlated with criminal behavior among his sample of high risk males. Those with higher quality jobs have more reason to feel invested in their employment and are less likely to risk losing their jobs. These findings were evident when controlling for the financial compensation received by the respondents as well as their educational achievement. Also holding income constant, Crutchfield and Pitchford (1997) found that job stability, measured as number of weeks employed over the last year, was significantly negatively related to participation in violent crime.

While treating crime as an alternative source of income, Witte and Tauchen (1994) were somewhat surprised to find that in their sample of young adults both involvement in work and school had the same deterrent effect on crime. From an economic substitution argument, this is difficult to interpret, while from the perspective of informal social control and the development of investments it makes perfect sense. Both work and school are age-appropriate investments in conventional behavior. School may not have supplied an alternative source of income, but it did

serve as a type of social capital that would be risked through criminal behavior. In predicting participation in criminal behavior, Sampson and Laub (1990, 1993) found that how long the respondent had been employed in their current job had a significant negative effect, but that an indicator of their occupational aspirations was not a statistically significant predictor of involvement in crime.

Being guided by the conceptual model discussed above and the findings of previous research, we would expect individuals with jobs to be less likely to participate in criminal behavior than individuals with no jobs. Those with no jobs have less to lose if their involvement in crime is detected. We would also expect individuals with higher quality or more rewarding jobs to be less involved in criminal behavior than individuals with lower quality or less rewarding jobs. From an objective basis, individuals with better jobs are experiencing more material and emotional rewards from their work. These rewards increase the sense of investment individuals have in their employment, causing them to feel as if they have more to lose if their jobs are taken away. It may also be reasonable to expect individuals who are working more intensively to commit fewer criminal acts. Full-time jobs are apt to provide more rewards than part-time work.

An alternative interpretation of the relationship between work and crime has been suggested by others (Wilson and Hernstein 1985; Gottfredson and Hirschi 1990) who have argued that certain individuals have cultural (Wilson and Hernstein 1985) or psychological (Hirschi and Gottfredson 1990) traits that increase the likelihood of both marginal employment and criminal behavior. According to this perspective, any observed relationship between employment and crime is spurious and will disappear if indicators representing these processes are included in the model. Gottfredson and Hirschi (1990) have focused on an underlying trait representing an individual's level of self-control (for a thorough review of this construct see Arneklev et al. 1993). This trait is thought to develop during childhood and remain constant

across the life-course. Individuals with low self-control are more likely to participate in crime and less likely to get or keep a rewarding job. This alternative explanation will be examined in the empirical model.

What Kinds of Crime?

The answer to the question of whether the influence of employment on crime will be similar for violent and property crimes depends almost entirely on the causal process that is expected to drive the relationship. Many economists have focused on property crimes because they view crime as a type of substitution for legitimate income. If both work and crime serve primarily as income generating activities, then we would expect unemployment, part-time employment, or poor quality employment to have a stronger influence on property crime. In fact, once we control for income, employment status, hours worked, and quality of employment should not really matter at all.

Social control theorists, on the other hand, have suggested that criminal motivation needs no explanation. It is a natural by product of self-serving ambitions. It is the forces that keep people from deviating that must be explained. Opportunity costs are determined by levels of investment in things that could be lost through participation in crime. They are not dependent on the type of criminal behavior. Informal social controls should have a similar effect across violent and property, or expressive and instrumental crime. By examining property and violent crimes separately, this question is addressed.

Measuring Employment

Employment Status

In making predictions about the deterrent effect of employment, we must consider competing non-employment activities as potential sources of social control and deterrence. Some individuals, for instance, have chosen not to work in order to make other types of investments or participate in other types of commitments that might also act as deterrents to crime. Others have been left out of the labor force against their will. Young adults who choose to attend college instead of getting a job have made substantial investments in conforming lines of behavior, investments that they stand to lose by participating in crime. In fact, given the sunken costs and delayed gratification involved in attending college, these individuals may actually have more to lose than those actively participating in the labor market. Research on social control theory has shown a commitment to school to be one of the strongest deterrents to delinquency among adolescents.

Similarly, individuals who have removed themselves from the labor market in order to raise children, or manage a household, may not be making an investment in their labor market future, but they are developing commitments that are also risked through involvement in crime. These commitments, which are apt to be related to children and family, may be as strong or stronger deterrents to criminal behavior than those investments related to work. When considering the effect of employment status on crime, why individuals are not working must be considered. Without taking competing commitments and investments into account, models of employment and crime are apt to be mis-specified. The current analysis includes indicators of both employment status and other age-appropriate activities that may also act to discourage criminal behavior.

H1: Respondents who are working, attending school or managing a household will be less involved in violent and property crime than those who are not working.

If we think of crime as strictly an economic activity, then we would anticipate a different process. We would not expect school attendance or household management to be very influential and we would expect work to only have an effect on property crime.

H2: Respondents who are working will be less involved in property crime. School attendance and household management will have no effect on either violent or property crime.

Part-Time Employment

Part-time employment serves as an indicator of a few potentially important processes. First, individuals working part-time are more likely than full-time workers to be working in secondary sector jobs. As discussed in Chapter 1, secondary sector jobs are less likely to offer a variety of beneficial job characteristics. Second, part-time workers are also less likely to be paid as well as full-time workers. Both beneficial characteristics and financial compensation can encourage the development of investments in employment. Third, part-time employment may alter how an individual spends their time and with whom they associate. If working less creates more opportunities to spend unregulated time in public spaces, it may increase criminal opportunities.

H3: Individuals working part-time will commit more violent and property crime than those working full-time.

Employment Quality and Investments in Work

While an individual's employment status is fairly straightforward, measuring investment in employment or the degree to which the respondent is rewarded becomes more complicated. One approach that has been used to measure investment is the use of indicators of job quality (Crutchfield 1989; Crutchfield and Pitchford 1997; Uggen 1999; Wadsworth 2000). One of the most common approaches to conceptualizing job quality has been the use of occupational categories (Crutchfield 1989; Crutchfield and Pitchford 1997; Uggen 1999). While this approach has the advantage of being more objective then subjective evaluations of employment, it is not without its weaknesses. Job classifications or typologies tend to be less specific and more ambiguous than focusing on specific job characteristics as reported by the respondent. A number of researchers have pointed to the fact that occupational categories can be vague and offer little detail.

In suggesting the desirability of a new type of job quality indicator, Jencks, Perman, and Rainwater (1988) noted that in the U.S. Census job typologies, the amount of variance in important job characteristics such as promotional opportunities, job security, and earnings that could be explained by the jobs three digit census code ranged from a low of seven percent to a high of forty nine percent. Concerning the ambiguity of these codes, Jennks et al. wrote, "Both the chairman of IBM and the manager of the local typewriter repair store fall in the category 'salaried manager: business services'" (pg 1325). So, while we may know from the occupational codes that an individual works as a skilled laborer in a manufacturing plant, we do not know anything about the specific tasks of the worker, the level of routinization of the work, or the conditions in which the work takes place.

This type of occupational characterization makes it difficult to rank professions from highest to lowest quality or from most to least desirable, which is necessary if we wish to treat job

quality as a variable in studies of work and crime. This kind of typology also does not acknowledge different experiences within similarly characterized jobs. For example, it tells us little about the degree to which the employee uses their skills or the direction they have over their work.

In his research on the effects of employment on child rearing, Kohn and Schooler (1982) found that it is these types of daily on the job experiences that significantly influence the behavior of the employee outside of work. Both the overall level of quality, and the different on the job experiences may influence the degree to which the respondent feels invested in their employment. Hence, these characteristics are very important in viewing the employment/crime relationship from any perspective that considers an individual's investment in work an important part of the process.

In his work with the National Supported Work Demonstration, Uggen (1999) addressed the job quality issue by assigning each respondent in the sample a job quality score that was independent of the respondent's own actual assessment of their job. Instead, the scores came from the average job satisfaction assessment reported in the Quality of Employment Survey (Quinn and Staines 1979) by respondents with similarly classified jobs. This approach provides the ability to rank the jobs from those that incumbents have assessed as most satisfying to those that have been assessed as least satisfying and addresses the concern of biased self-reports. However, it does not address Jenks' concern over the lack of variance in these types of measures (1988). Because the average satisfaction scores are drawn from the very general occupational categories this system does not allow for any variance in satisfaction, or quality, among jobs that fall under the same broad classification.

In addition to not allowing for within category variance, neither the traditional approach of using job typologies or classifications nor Uggen's approach take into consideration the

potential importance of subjective assessments. Working under the assumption that employment can influence levels of commitment and investment, how the respondent perceives the situation is crucial. It is this perception that will inform any type of decision making process. Given the importance of the employee's perceptions, subjective assessments (whether they are in accordance with the reality of the situation or not) may be more useful indicators of a respondent's perception of job quality. If so, they can serve as a more valid measure of investment in work than a more objective indicator of job quality.

Holding other relevant factors constant, we would expect an individual to be more involved in criminal behavior if they *felt* less invested in their work. If individuals think that their job offers promotional opportunities, a pleasant environment, good benefits, etc., they are apt to be more invested in their job *whether or not their perceptions are accurate.* So, while some researchers have suggested the importance of using objective measures of quality of work (Uggen 1999; Jencks, Perman, and Rainwater 1988), I would argue that given the theoretical framework being adopted here, informing how the quality or characteristics of work may influence criminal behavior, it is more useful to use subjective measures. It should also be noted that much of the concern over the use of subjective measures has focused on the use of global work satisfaction measures, which are probably the most easily biased indicators, as their generality increases the chance that they could be affected by attitudes or dispositions. Subjective assessments of specific work characteristics such as those discussed below are apt to be considerably more reliable.

In the present work, I use three factors comprised of self-reported job characteristics. These measures can be treated independently and collectively viewed as indicators of job quality. Job quality can be thought of as a proxy for investment in employment. These measures of job quality include indicators of rewarding job attributes, whether the employee receives health and vacation benefits, and work conditions.

The indicator of rewarding job attributes is intended to tap into a general level of contentment the respondent has with their current job. This contentment is expected to add to a feeling of investment, or the creation of "opportunity costs." Many of these costs are not directly related to financial compensation and are therefore more representative of the non-economic aspect of the social control perspective. The specific measures which comprise the indicator of rewarding job attributes include questions concerning whether the job provides: promotional opportunities, job security, a good income, a pleasant working environment, a feeling of significant contribution, and the opportunity for the worker to maximize their abilities.

Promotional opportunities and job security are good indicators of how the respondent views the future of this job. If he or she feels that the job will provide avenues for advancement and that he or she is not likely to be laid off or fired, there may be a greater sense of investment. Individuals who feel that they work in a pleasant environment and are paid well may experience more contentment with their employment and feel that losing the job would be more of a hardship. The last two indicators that comprise the factor relate to emotional or psychic rewards stemming from employment. Respondents who feel that their work is a significant contribution and that it allows them to maximize their abilities are likely to value their jobs more highly and feel that they are an important aspect of their lives.

The existence of benefit packages may have several meanings. First of all, jobs that include benefits are more likely to be professional or unionized jobs. Both of these types of jobs tend to be of higher quality and will likely score higher on both income and the indicator of rewarding attributes. However, apart from overall job quality, the availability of benefits may have other meanings. First of all, they may be one more "reward" that a respondent may not want to risk losing. For young adults, jobs with such benefits may be hard to come by and hence more

valuable.[1] Second, benefit packages may indicate a degree of mutual investment. Their existence suggests that the employer has made an investment in the respondent, and because there often needs to be a duration of employment before the employee is "vested" with these benefits, it suggests that the employee may have made some investment as well.

Job conditions may affect the investment respondents have in their jobs by determining the level of enjoyment or satisfaction they get from their employment. Those working under harsh or unhealthy conditions may be less likely to be concerned with the prospect of losing their jobs, as the alternatives, unemployment or jail, may not seem as bad to them as they would to respondents working under beter conditions. This indicator measures the more non-economic aspect of investment in employment.

Given that all three of the indicators of investment in employment are expected to tap into the subjective experience of having an investment in ones job I predict that their effects on crime will be similar and will be additive. In other words, if a respondent scores high on all three of the indicators, it suggests higher quality employment, and therefore more investment in their job, than if they had only scored high on one of them. If the effects of the indicators are different, this may suggest that there is something about the specific characteristics, not just overall job quality, that has an effect on crime. Because the influence of informal social controls is not specific to certain types of crime, the effects of the indicators of investment is expected to be similar across both violent and property crime.

H4: Rewarding job attributes will have an inverse relationship with participation in violent and property crime.

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[1] A frequency count of all the employed individuals in the NLSY79 shows that 49.2% received health benefits and 58.1% received paid vacation. These percentages are significantly lower if only the civilian

H5: The presence of employment benefits will have an inverse relationship with participation in violent and property crime.

H6: Poor working conditions will have a positive relationship with violent and property crime.

An important question is whether job quality will have any influence on crime beyond its economic effect. Given that higher quality jobs are likely to pay higher wages, economists might argue that it is the higher wages of these jobs that will explain any deterrent effect of job quality. Social control theorists on the other hand might argue that non-economic factors can also create a sense of investment in work that will discourage criminal behavior. To explore this possibility, I have included a measure of individual income in all of the models.

Another alternative hypothesis from more of an economics perspective might be that variables representing the more economic rewards of employment would be more important than the emotional or psychic rewards and that these effects would be more evident when examining property crime. While it is difficult to strictly categorize the measures, it could be argued that certainly income, and perhaps the indicator of health and vacation benefits would fall in this category and should therefore be more influential.

H7: With income held constant, only employment benefits is likely to have an effect on crime and this effect will be limited to property crime.

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employees are included.

Three more hypotheses are suggested that point to important aspects of the relationship between employment and crime. The first serves to examine the role of education. In many ways, education is an investment that is directly connected to employment. Individuals require both the skills and the credentials that being in school offers in order to successfully compete in the labor force. For this reason investment in education is very similar to investment in employment. I expect educational achievement and current enrollment to deter criminal behavior.

H8: Educational achievement will be negatively related to participation in both property and violent crime.

H9: Current enrollment in college or high school will decrease involvement in violent and property crime.

The last hypothesis tests for possible support for Gottfredson and Hirschi's claim that the relationship between employment and crime is actually due to low self-control. Measures of serious school misbehavior and educational achievement should serve as reasonable measures of self-control. If Gottfredson and Hirschi are correct in suggesting that it is self-control that drives both criminal behavior and weak attachment and marginalized labor force activity then there should be no relationship between employment and crime once these measures are included in the model.

H10: When including indicators of self-control in the model, there will be no relationship between employment characteristics and criminal behavior.

Variables

Employment Variables

The variable concerning respondents' labor force status comes from a series of questions in the NLSY that asked respondents whether they were employed for pay, how many hours they worked, and what their main activity was during the survey week (the main categories being: employed, student, military, unemployed, managing the house, unable to work, and other). The number of respondents who responded that they were "unable to work" or "other" was small (N= 24 and N= 317, respectively). These two categories were combined with "unemployed" to create one indicator of "not working." There is no reason why the motivation for not having a job should change the level of investment that employment and other activities create. A person who cannot work has no investment in employment, just as a person who chooses not to work has no investment in employment. In the analyses, "not working" was treated as the reference, and the other activity categories were included in the model.

The respondents main activity during the survey week, along with the number of hours worked, were used in a skip pattern to determine whether information was collected about the respondents' employment characteristics. With a few exceptions, individuals who reported being employed during the survey week for pay and who worked twenty hours or more were asked about the characteristics of their jobs.

Principal components factor analysis was used to create the three job characteristic factors discussed above: rewarding attributes, employment benefits, and working conditions.

These factors cluster on both theoretical and empirical grounds.[2] The indicators used to generate the factors come from three lists of questions concerning fringe benefits, job characteristics, and job satisfaction that were asked of each employed respondent in the NLSY79.[3] Each of the questions was followed by one of three response sets. The response sets for the questions concerning benefits offered two potential answers, "yes (I receive this benefit)" or "no (I do not receive this benefit)". The response sets for the questions concerning employment satisfaction were based on a four point set with the options being "not true at all," "not too true," "somewhat true," or "very true." The questions concerning employment characteristics were followed by a five point response set including "minimum amount," "not too much," "moderate amount," "quite a lot," "maximum amount."

The first of the three factors which represents rewarding attributes of employment includes indicators from both the list representing employment characteristics and the list representing employment satisfaction. The values on this variable range from –3.06 to 2.03 with a mean of .023 and a standard deviation of 1.02. Names, descriptions, means and standard deviations for all of the variables in the models are listed in Table 4-1.

The second factor represents benefits, or the degree to which the employer has invested in the respondent. This factor includes indicators of whether the respondent is covered by health insurance and whether or not they receive paid vacation. These indicators were answered with "yes" or "no" responses. The existence of benefit packages may have several meanings. The

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[2] After performing exploratory factor analysis including 13 different job attributes, it became evident that the characteristics formed three unique variables that represented three theoretically distinct underlying constructs. I then created variables by extracting factor scores while performing confirmatory factor analysis on the three different constructs. The first factor, representing rewarding attributes of employment, included six indicators with factor loadings that ranged from .545 to .665. The second factor, representing benefits or the degree to which the employer had invested in the employee, had two indicators, both with factor loadings of .912. The third factor represented the conditions in which the respondent worked and had two indicators, both with factor loadings of .854. More detail is given in Appendix 4-A.

values on this variable range from –1.19 to 1.01, with a mean of .266, and a standard deviation of .939.

The third factor, which represents the conditions in which the respondent works includes indicators of whether the respondent works under dangerous, or unhealthy conditions. The mean of this variable is .101, the standard deviation is 1.048, and the values range from -.996 to 2.526.

As discussed above, it is expected that each of the three factors representing employment characteristics and employment quality will have a deterrent influence on criminal behavior. Both the factor loadings generated during exploratory factor analysis and the zero-order correlations between the different factors suggest that they are measuring distinct underlying constructs. However, these different constructs are all contributing to an overall quality of employment which is thought to promote a sense of investment.

Background Characteristics, Commitments, Income and Previous Delinquency

In addition to the variables concerning characteristics of employment, I have included a number of other individual-level variables in these analyses both to control for spurious processes and to further examine the process of investment. These variables fall into four categories: background variables, commitments, income, and previous delinquency.

The background variables include the age, sex, and race of the respondent. Predictions based on an abundance of previous research would suggest that males (Broidy and Agnew 1997; Guis 1999) and younger respondents (Shavit and Ratner 1988; Hirschi and Gottfredson 1983) are apt to be more involved in all three types of crime. Both of these variables are also apt to be related to both employment status and employment characteristics.

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[3] Questions concerning fringe benefits were not asked of the respondents who were enlisted in the military because all members of the armed forces receive health insurance and vacation benefits.

The current analyses include two dichotomous variables indicating whether the respondent is black or Hispanic (the reference group being non-Hispanic whites). While race has received much attention in criminological research, there is a lot that we do not know about the relationship of race to involvement in crime. Evidence from an abundance of research suggests that blacks and some other minorities are significantly over represented in official records of criminal behavior. However, the degree to which this over-representation is an effect of poverty, institutional bias, geographic location, and other aggregate and individual-level factors is an empirical question that has not been thoroughly answered. It has also been suggested by Hindelang, Hirschi, and Weis (1981) that there is evidence of systematic underreporting of self-reported criminal activities by young black serious offenders. Given that the present research includes variables representing many of the factors that may increase participation in crime by blacks, Hispanics and other minorities, such as income, education, and employment quality, I do not expect race to influence participation in criminal behavior. However, to insure against the possibility of omitted variable bias, I have included these indicators in the model.

The commitment variables include whether or not a respondent is married, the level of education that the respondent has achieved, whether or not the respondent is currently enrolled in high school or college, and whether or not the respondent is currently serving in the military. Sampson and Laub's (1993) analyses of the Gluek data (1950) suggest that marriage is one of the important turning points in the life of a young adult. The development of an attachment to a spouse increased the likelihood of desistence from criminal behavior among the delinquent young males in their sample. This finding supports the predictions of an age-graded version of social control and is concurrent with the findings from other research that shows marriage to have a deterrent effect on criminal behavior (Crutchfield and Pitchford 1997; Osborn and West 1979; Warr 1998).

The deterrent effect of an individual's commitment to and achievement in school has been one of the most consistent findings in delinquency research. (Hirschi 1969; Wadsworth 2000). While the focus of the current study is on young adults, not juveniles, I would expect the influence of school achievement to be similar. Independent of current employment status, those individuals who were more committed to the educational process would have been less likely to participate in juvenile misbehavior, which is one of the best predictors of adult crime. Commitment to school also suggests an age-appropriate investment in conventional behavior.

Current enrollment in college or high school is also expected to have a deterrent effect on criminal behavior, as it is another indicator of commitment to the academic process. While current enrollment in college suggests investment in a long-term process, given that the respondents in the analysis are between the ages of eighteen and twenty-three, attempts to complete high school may also suggest a commitment to the academic process. While education is considered an important investment that will be focused on in the analysis, its indicators and those of the other commitment variables are also included in the model to avoid potential spuriousness and omitted variable bias.

Enlistment in the military could serve as either a career investment that deters criminal behavior or a socialization process that encourages certain illicit or risky behaviors such as fighting or assault. Previous research has suggested that individuals in the military are more likely than their civilian counterparts to engage in violent behavior (Crutchfield and Pitchford 1997). This propensity towards violent behavior could be related both to a socialization and training process in which violence is, at times, viewed as an acceptable tool for conflict resolution, and to the fact that military enlistees spend most of their time surrounded by other young men, those most likely to fill the role of aggressor or victim.

Both individual and household income are included in the models predicting criminal participation. Much of the research exploring the relationship between employment and crime at both the individual and aggregate levels has treated income as an important causal factor. These models, which often stem from economic choice theories of criminal offending, view legitimate employment and criminal behavior as competing methods of earning a living (Becker 1968; Doyle et al. 1998, Grogger 1998). Given this theoretical approach, it is often predicted that income will be inversely related to a respondent's level of criminal involvement.

In the model proposed in the current research, investment in employment may stem from non-economic factors as well. Feeling like your work matters, opportunities for advancement and enjoyable working conditions may all contribute to this sense of investment. However, income is still included in the model for a number of important reasons. Foremost, the actual amount of money a respondent's work generates is likely to be related to other characteristics indicating the quality of their employment. Therefore, without including income in the model we cannot be sure that any significant effects that the employment characteristics have on criminal behavior are not spurious.

Second, it is possible that income may have a significant effect on crime outside of its influence on employment quality. By including measures of income in the model we can separate the influences of job quality and job characteristics from the financial compensation that work provides. I expect the individual influence of income to be consistent with previous findings which have shown it to have an inverse relationship with involvement in economically motivated crime (property crime), but little or no relationship with violent crime.

The measures of household income and individual income measure two different but related concepts. The family income variable is a variable created by the administrators of the NLSY. It was generated from a number of variables representing different possible sources of

income in the household. These include everything from salaries to federal and state assistance. Only about one quarter of the NLSY79 respondents had established their own household in 1979, so for most of the respondents the household income includes the earnings of their parents and any other family members living with them. For the respondents who had established their own household at the time of the interview, household income includes their own income as well as that of other members of their household.

Individual income is an indicator of how much money the respondent alone made over the last year. For those individuals still living in their parents' household (this includes respondents who are enrolled in college or in the armed forces), household income may serve as a proxy for socio-economic status, while individual income may act as an indicator of their own earning performance. For these respondents the correlation between the two income measures ($r=.091$) is statistically significant at the $p<.05$ level. For the respondents who have established their own households, the indicators are highly correlated ($r=.394$) and are probably serving as multiple indicators of the same basic concept.[4] To parcel out the effects of income, I included a variable indicating whether the respondent lived in the parental household or had established their own household. This variable may also act as a weak indicator of opportunity to commit crime given the increased freedom that comes with living outside of the parental household.

I have also included an indicator of previous school suspension or expulsion in the models. One of the best predictors of adult crime is juvenile delinquency. Juvenile delinquency may also decrease the likelihood of successful involvement in the labor market. While not perfect, school suspension and expulsion serve as reasonable measures of juvenile delinquency. This measure will be discussed in more detail in the model specification section below.

Measures of Criminal Behavior

The two dependent variables used in the analyses are indicators of involvement in property crime and violent crime. The variable indicating participation in property crime is a scale comprised of the respondents' answers to questions concerning how many times in the last year they participated in: vandalism, shoplifting, theft of an object worth less than $50, theft of an object worth over $50, auto theft, burglary, and selling stolen property. The NLSY79 truncated the frequencies reported by the respondents to create ordinal scales indicating levels of involvement for each type of crime. I added these scales together to form overall measures of involvement in property crime. This same process was used to create an overall measure of involvement in violent crime, which includes measures of fighting, threatening, taking something by force, and assaulting.

There are both advantages and disadvantages of using self-reported vs. official measures of criminal behavior. Some of the benefits are that there tends to be greater variance in self-reports concerning both incidence and prevalence and the data are not influenced by institutional bias related to arrest and charging decisions. Variables such as race, employment status, and socio-economic status have all been shown to influence whether individuals are arrested and prosecuted for their alleged criminal behavior. Using self-reports is also advantageous in that it is a much weaker indicator of the development of a criminal record and therefore is less likely to have strong reciprocal effects with poor quality employment or unemployment.

One disadvantage is that self-report measures tend to be indicators of less serious criminal behavior (although this is not really the case in the NLSY). In most random samples there are a relatively small number of individuals who have participated in serious criminal

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[4] While the Pearson Correlation of .394 suggests a certain amount of overlap, and that including both of the variables in the model is apt to decrease their individual effects, it is not strong enough to encourage serious

behavior. Even fewer have an extensive history of crime. This lack of variance in the dependent variable makes it difficult to estimate predictive models. For this reason, many surveys do not ask about serious criminal behavior. The NLSY did ask questions about fairly serious crime, but the vast majority of respondents reported no or very little involvement. Self-report measures can also struggle from validity issues. Respondents do not always tell the truth, and those participating in crime may be the most likely to minimize (or exaggerate) their involvement. However, research has suggested that overall, they serve as accurate measures of individuals' participation in illegal behavior (Hirschi, Hindelang and Weis 1981). Table 4-2 shows the zero-order correlations for all of the variables included in the model.

Data

As discussed in detail in Chapter 2, the data for this analysis come from the 1979 and 1980 waves of the National Longitudinal Survey of Youth. I have included all respondents who were age eighteen and over during the first wave of data collection in 1979. Those under the age of eighteen have been eliminated as the focus of this analysis is on adult work and crime.

Analytic Strategy

Perhaps one of the most commonly debated questions in the study of employment and crime concerns the proper causal sequence of employment and crime. While the theoretical arguments presented above suggest that unemployment or poor quality employment influences an individual's participation in criminal behavior, it is also quite likely that criminal behavior may hinder consequent success in the labor market. A number of studies in sociology and economics have shown that involvement in crime tends to have a negative effect on future employment

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concerns over collinearity.

success (Thornberry and Christenson 1984; Hagan 1993; Grogger 1995). Individuals who have been formally sanctioned for criminal activities are apt to experience more difficulty in securing employment and are less likely to obtain higher quality jobs. This difficulty can be caused both by spending time out of the labor force while incarcerated, as well as by the presence of a criminal record that can dissuade perspective employers.

It has also been argued that certain individuals have cultural (Wilson and Hernstein 1985) or psychological (Hirschi and Gottfredson 1990) traits that increase the likelihood of both marginal employment and criminal behavior. Proponents of these "third variable" perspectives argue that the relationship between employment and crime is spurious. As discussed in Chapter 1, Fagan and Freeman (1999) noted the difficulty that researchers have had in controlling for alternative temporal sequencing for the employment/crime relationship and conclude that the true relationship between the variables is probably at least somewhat reciprocal. Collectively, these alternative explanations suggest that just because employment and crime are correlated does not mean that employment is influencing crime.

The current analysis does not examine reciprocal effects, but it does take precautions to insure that the examined causal pathway is, in fact, moving from employment to crime. In focusing on one direction of the relationship, there are two common approaches used to increase confidence in the causal order of the employment/crime connection. First, lagged variables can be used to insure that the employment came before the criminal behavior. When longitudinal data are available, this can be done by measuring employment at time one and criminal behavior at time two. Because this leaves open the possibility that the employment measured at time one was actually preceded and influenced by previous criminal behavior, it is optimal to include in the model a control for previous criminal behavior. In the current research, both of these approaches are adopted.

It should be noted that utilizing these approaches does not suggest that there are no reciprocal effects between the two variables, only that we can be more confident in the causal direction of the process being examined. In utilizing previous measures of criminal behavior, I would ideally like to include in the model identical measures of criminal behavior measured at an earlier time point. These could either be used as control variables or be combined with current indicators of participation in illegal activities to form change scores that could then be regressed on the independent variables. However, as mentioned earlier, self-report information concerning involvement in criminal behavior was only collected during the 1980 wave of the NLSY. While this hinders the construction of the optimal model, a question was asked in 1979 concerning whether the respondent had ever been suspended or expelled from school.

While not perfect, these are reasonable measures of previous serious misbehavior. Previous research suggests that adolescent delinquency is one of the best predictors of adult criminal behavior. Correlations of $r=.270$, and $r=.196$ which are both significant at the $p<.001$ level, representing the relationship between whether the respondent was ever suspended or expelled from school and the degree to which they reported having participated in violent and property crime over the last year suggests the validity and utility of this measure. This variable is included in all of the regression models. If employment status or investment is significantly related to crime after controlling for school misbehavior, we can be more confident that the relationship between work and crime is not moving in the other direction or caused by some underlying construct, like self-control.

In addition to controlling for school misbehavior, I use independent variables (background characteristics, commitments, previous delinquency, and employment characteristics) that were collected in the 1979 wave of the NLSY and dependent variables (indicators of criminal behavior) that were collected in 1980. With the exception of the two

income variables (indicators of income over the previous year) and the school misbehavior variable (a retrospective measure over the life course) all of the independent variables are indicators of current status or condition at the time of the survey. In contrast, the measures of participation in criminal behavior were collected roughly one year later (the next time the respondents were interviewed) and include reports of any illegal activities committed over the last year. Therefore, with some error due to the timing of interviews and inaccurate recall, the dependent variables can be treated as the criminal behavior of the respondents for the twelve months after the information on employment, commitments, status and background variables were collected.

The second challenge concerns the examination of employment characteristics. One focus of this chapter is to estimate the influence of individual-level investment on employment by regressing participation in criminal behavior on indicators of employment quality. But many of the respondents are not working and therefore do not have any observable employment quality. In the first step of the analyses, we can determine whether having or not having a job leads to different levels of participation in crime. In the second step, we are left with a large amount of missing data.

There are a number of ways to address this methodological hurdle. Perhaps the easiest way to resolve this issue would be to only include those individuals who are employed in this step of the analyses. In using the NLSY to explore the effects of wages on youth crime, Grogger proposed that, as his main interest was the effect of wages on the criminal behavior of individuals who had entered the labor market, there was no reason to include in the analysis respondents who were not working (1998). While this approach decreases the complications in modeling the relationships, it can also be quite problematic.

By only including respondents from the NLSY who are working in the analyses, the sample is being selected on a variable (employment status) which may be correlated with the outcome measures. If the data were missing randomly this would not pose as much of a problem. However, they are not. Individuals with missing data on the employment quality variables are individuals who are either unemployed or have removed themselves from the labor market in order to attend school or manage a household. The propensity to select oneself (or be selected) into any one of these categories may be related to their participation in crime. This process will not only significantly decrease the size of the sample, it may bias the coefficients representing the effects of the other variables in the model and threaten our ability to generalize the findings to the larger population.

To avoid this type of selection bias I have taken a conservative approach to addressing this issue that allows the non-working respondents to remain in the sample and includes all of the respondents (working and not working) in the models addressing the influence of work characteristics. I impute a constant (in this case "0") as the value of the work characteristic variables for all of the individuals who are not working and add a dummy variable indicating whether or not the values of these variables were imputed for each of the cases. This is considered a conservative approach because while keeping all of the cases in the analyses, by imputing a constant and controlling for missing cases, the "work characteristics" effect has been limited to only individuals who were working.[5]

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[5] While students, those managing households, the unemployed, and other respondents not in the labor force do not have observable employment characteristics, it is useful to think about what these characteristics would be if they did have them. College students have made investments in their future, succeeded academically, and are training for more advanced occupations. If they were to have entered the labor market instead of seeking higher education, they may have received higher quality jobs than those individuals who did not choose to go to college. Therefore, from the perspective of making investments, college students are giving up current wages in order to accumulate human capital. This is a big investment. Individuals whose unemployment represents a lack of success in the labor market would probably be in lower quality jobs if they were employed, and therefore have less invested in conforming behavior. In this

In the results section, I present two main analyses. In each analysis there are two models, one for violent crime and one for property crime. The first analysis examines the effect of labor force status on participation in crime. These models include background variables, non-education related commitments, and dummy variables indicating employment status. I do not include educational commitments as they are highly correlated with the employment statuses. The second analysis includes the full models in which all of the commitment variables, employment characteristics, and income are included. These allow us to determine whether or not the hypotheses related to job characteristics and employment quality are supported.

The scales representing involvement in the different types of crime were created from truncated frequency counts and therefore are not easily convertible to an interpretable metric. For this reason standardized coefficients which estimate the relative influence of the independent variables on the dependent variable are listed in the table and discussed in the text.

Results

The Effect of Having a Job

As mentioned above, the first part of the question of whether or not employment influences criminal behavior is whether or not being employed, unemployed or out of the labor force affects participation in crime. Table 4-3 shows the relationships between different labor

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sense, they are not out of the labor force, they are at the bottom of it. While more difficult to classify, if those individuals who are out of the labor force because of decisions to manage households, attend high school, or because they are unable to work were to have entered the labor force, they may not be randomly distributed throughout different levels of employment quality. By not including any of these individuals in the examination of how employment characteristics influence criminal behavior, we are systematically decreasing the variance in the variables representing employment characteristics. We are only considering individuals who theoretically fall along the middle of the investment spectrum. Despite this drawback, I have chosen to adopt this approach as I would rather use a more conservative model to test the hypotheses. Other approaches to addressing this issue are discussed in Appendix 4-B.

force statuses and participation in violent and property offenses after controlling for age, sex, race, marital status, whether or not the respondent has established their own household, income and school misbehavior. The only variables not included in the model that were discussed earlier are the indicators of employment quality and educational commitments. These were excluded to determine whether status as an employee or student alone will influence criminal behavior, without considering quality of employment or educational success. Controlling for other factors, employed respondents committed significantly fewer violent crimes (Beta= -.042 $p<.05$) than unemployed respondents but had similar levels of involvement in property crime. College students (Beta= -.051 $p<.001$ and Beta= -.030 $p<.05$) and high school students (Beta= -.027 $p<.01$ and Beta= -.041 $p<.01$) committed significantly fewer acts of both violent and property crime respectively.

Collectively, these findings offer support to the first hypothesis (***H1***) predicting that those who had made investments in work or school would have lower levels of participation in crime. These findings demonstrate that the influence of educational status is consistent across the different types of crime. However, employment *per se* only influences violent crime. The first hypothesis (***H1***) also predicted a similar finding for those managing households. This was not supported. There does not appear to be any deterrent effect stemming from household management. The other labor force status for which no hypotheses were suggested, military status, has no significant relationship with involvement in crime.

Similar to the results in Chapter 3, these findings do not support a more strictly economic model. Drawing from this approach, the second hypothesis (***H2***) suggested that only employment would demonstrate a negative effect on crime, and only in the case of property crime. Almost the exact opposite was true. Being in high school or college significantly decreased participation in both types of crime, and employment only had a deterrent effect on violent crime. It appears that

an interpretation that includes non-economic factors is important in understanding the individual-level relationship between work and crime.

While most of the background variables displayed relationships consistent with previous research, the coefficients suggesting that blacks had similar levels of involvement and Hispanics had significantly lower levels of involvement (Beta= -.038 $p<.01$) in violent crime is worth noting. Both blacks and Hispanics had significantly lower levels of involvement in property crime (Beta= -.072 $p<.001$ and Beta= -.034 $p<.01$ respectively).

In order to compare more directly the effect of being employed versus being in school or in the military, I re-ran the OLS models using employed as the reference category. The findings (not shown here) suggested that those who have removed themselves from the labor market in order to attend college or high school committed significantly fewer property crimes than respondents who were employed. Those in college also tended to commit fewer violent crimes than their employed counterparts. Education may present greater "opportunity costs" than employment. Students, especially college students may feel as if they have more invested in conventional lines of action than those who are employed. For this reason, without considering subjective attachment, involvement in education appears to be a more significant deterrent of crime than involvement in work. When compared to employed civilians, respondents in the military committed more violent crime, but demonstrated similar levels of participation in property crime. I suggest that this finding represents a causal process more related to socialization and opportunity than levels of investment.

The central hypotheses in this chapter propose that the investments and commitments that individuals make in age-appropriate conventional lines of behavior, including employment, will act as controls or investments that deter participation in criminal behavior. The analysis discussed above offers preliminary support to this proposal. I have also suggested that for the respondents

who had entered the labor force, job characteristics, serving as indicators of job quality and investments in conventional lines of behavior, may deter criminal behavior. Overall, the analysis offers support to these claims.

The Influence of Employment Characteristics

Using OLS to estimate regression models of participation in violent and property crime on the independent and control variables mentioned above demonstrates that background characteristics, commitments, previous delinquency and work characteristics all exert significant influence on participation in violent crime. Most importantly, given the focus of this research, two of the three factors representing employment quality are significantly related to violent crime, and all three significantly influence involvement in property crime in the expected direction. Those respondents receiving benefits committed significantly fewer (Beta= -.033 $p<.05$) and those individuals working in poor conditions committed significantly more (Beta=.059 $p<.001$) acts of violent crime. The factor representing rewarding job attributes is not significantly related to participation in violent crime.

Rewarding job attributes, employment benefits, and poor working conditions all significantly influence the level of participation in property crime (Beta= -.037 $p<.01$, Beta= -.040 $p<.01$, and Beta=.028 $p<.05$ respectively). These findings offer support to ***H4***, ***H5***, and ***H6*** which predicted that these indicators of work quality would have a deterrent effect on crime. The one exception being that the indicator of rewarding attributes was not significantly related to violent crime. The findings also show that the crime that employment influences need not be economically motivated, or based around income generating activities. The finding that non-economic aspects of employment may influence decisions to participate in property and violent crime alike offers further evidence for an interpretation of the employment crime relationship that

draws on the concept of investments and informal social control. It also suggests the utility of treating subjective measures of job quality as indicators of investment in employment

In considering a more strictly economic perspective, ***H7*** suggested that when income was included in the model only employment benefits would influence crime (and its influence would be restricted to property crime) as it was the only measure of employment quality that tapped directly into economic characteristics. This hypothesis was not supported.

Stemming from propositions of Gottfredson and Hirsch's self-control theory, ***H10*** predicted that once school misbehavior and educational achievement (measures of self-control) were held constant there would be no relationship between employment and crime. As discussed above, this is not the case. Even after controlling for educational achievements, school misbehavior and a number of other influential variables, indicators of job quality were significantly related to criminal behavior. This demonstrates that the relationship between employment and crime cannot be attributed solely to individual self-control.

Part-time employment had virtually no effect on participation in crime. This does not support the hypothesis related to part-time employment (***H3***) which suggested that part-time employment would promote less of a sense of investment in work and therefore be a weaker deterrent to crime. Part-time and full-time employees did not differ in their participation in violent or property crime.

Once controlling for all of the background, commitment, income, previous delinquency, and work characteristic variables, the only labor force status that appeared to have any significant influence on participation in violent or property crime was managing a household. Those managing households committed fewer property crimes (Beta= -.029 $p<.05$). Being employed may have had no effect on crime in this equation because of the difference between involvement and investment. It may be that once quality of job is considered, just having a job does not have

much of an effect on crime. Respondents with higher quality jobs have higher "opportunity costs". They have a more valuable investment to protect. When only comparing "employed" to "not employed", these high investments are captured by the "employed" category. Therefore, employment appears to have a deterrent effect. However, once job quality or investment is included the effects of having a job go away. Concerning the student status variables that were significant in the first analysis, their influence is probably being picked up by the enrollment variables. These two sets of variables are highly correlated (r=.530 and r=.552 respectively).

The importance of other commitments and investments that were hypothesized to deter criminal behavior is also supported by the model. All three of the variables representing investment in education are significantly negatively related to involvement in violent crime. Educational Achievement has the strongest negative effect (Beta= -.063 p<.001). Being enrolled in high school (Beta = -.038 p<.01) or college (Beta = -.051 p<.001) also has significant negative influence on violent crime. Only enrollment in college had a deterrent effect on property crime (Beta =-.058 p<.001). These relationships offer partial support to ***H8*** and ***H9*** which predict that educational achievement and enrollment respectively, will have a negative influence on participation in crime. This appears to be true in the case of violent crime, but only true for property crime when examining enrollment in college.

As mentioned earlier "opportunity costs" will only deter criminal behavior if individuals feel that they are risking these opportunities by participating in crime. In general, violent crimes are considered much more serious than property crime. It may be the case that investments in education are not seen as being as much at risk through involvement in property crime when compared to violent crime. For this reason educational achievement and enrollment in high school serve as less of a deterrent to property crime. As a whole, however, these findings do

suggest that even beyond adolescence, commitment to the educational process may significantly decrease involvement in some types of crime.

Holding all else constant, individuals who are married commit fewer property crimes, but about the same number of violent crimes. Respondents who had established their own households did not commit crimes at significantly different rates than those respondents who lived with their parents. As would be predicted, respondents who had been suspended or expelled from school committed significantly more acts of violent and property crime. This measure was the strongest predictor in the model.

When considering income, only individual income had a significant influence on criminal behavior, and only on property crime. This finding is consistent with the literature focusing on income, wages, and crime which has found the relationship to be much more prevalent when property crime is considered.

Among the background variables, males and younger respondents committed significantly more acts of violent and property crime. These findings concur with the general trends demonstrated in the criminological literature. Holding other variables constant, blacks had lower levels of involvement in property crime and Hispanics had lower levels of involvement in violent crime. The rates of violent crime among blacks and property crime among Hispanics did not differ significantly from the rates of involvement in these types of crime for non-Hispanic whites.

Discussion

On the whole, these findings suggest that labor force involvement, alternative age-appropriate activities, and quality employment are all types of investment that can deter criminal behavior. While not statistically significant in every case, the effects of being employed, being in

school, educational achievement, and the three measures of employment quality were consistent across all three types of criminal behavior. This continuity of influence across both the different indicators of employment status and quality and the different types of crime suggest that the mechanism underlying these relationships is not particular to one specific aspect of a job or one type of criminal behavior.

Economists, and those working from a framework emphasizing economic rationality, have often viewed crime as an alternative form of work. As a result, the focus has been primarily on the economic compensation generated from both work and crime (Becker 1968; Grogger 1998). The current analysis suggests that the process by which work is related to criminal behavior is, for the most part, similar across both instrumental and more expressive types of illicit activity. In addition to widening the scope concerning the types of crime that work may influence, these findings encourage us to broaden our understanding concerning what aspects of employment may influence crime. While the perspective emphasizing the role of age-graded informal social controls and investments in conventional activities is not in contradiction with rational choice models, the variables that must be included in the decision making process go beyond strictly monetary considerations.

The findings from the first stage of the analyses suggest that while controlling for sex, age, race, marital status, living situation, socio-economic status, income, and school misbehavior, individuals who are working or in school are less involved in violent crime. Those individuals in school are less involved in property crime as well. This deterrent effect of labor market status is very supportive of theories that view investments in conventional activities as stakes in conformity that can discourage criminal behavior. It suggests that those individuals who are either employed or have made investments in certain other age-appropriate conventional activities tend to have lower levels of involvement in crime than individuals who are unemployed.

When compared to the respondents who were employed, those individuals whose primary activity was either college or high school had significantly lower levels of involvement in every type of criminal behavior analyzed. These findings support the general deterrent effect of school involvement on crime that has been identified in much of the previous literature in the area (Witte and Tauchen 1984; LePore, Wadsworth, and Lee 1999). The effect of being in school may result from a greater sense of investment in conventional behavior among young adults who have more "long range" commitments. These individuals have made investments in which the returns will take longer to materialize. This investment in human capital development appears to serve as a deterrent to criminal behavior.

It is also possible that while both employment and school involvement can act as a deterrent to crime, employment may increase opportunities to commit property crime by providing access to potential targets. School involvement does not supply these opportunities. It is much more difficult for students to dip into a cash register or steal goods from a storeroom than it is for employees. This explanation may explain why being employed had a deterrent effect on violent crime, but not property crime, however, it cannot explain why students committed fewer violent crimes than employed respondents.

Military enlistment was not significantly related to criminal involvement. It may be the case that individuals engaged in these activities do not experience opportunity costs in the same manner as those employed or in school. Those in the military may not feel that participating in crime will cause them to lose their positions. If this is the case, there should be no deterrent effect. Those managing households committed less property crime, but similar amounts of violent crime. In addition to levels of investment, this may in part be the result of decreased opportunity.

An alternative explanation for the findings that employment status is related to criminal behavior is based on self-selection. Students, employees, and unemployed individuals are not

randomly assigned into their positions. Certain characteristics, aptitudes, and opportunities will influence where individuals end up. It has been argued that certain traits such as self-control may influence both an individuals labor market status and their level of participation in crime. Individuals who self-select into unemployment may be more likely to commit crime, while individuals who self-select themselves into college may be less likely to commit crime. Including school misbehavior and family income in this model minimizes the possibility that these findings are the result of self-selection.

The findings from the second part of the analysis suggest that the influence of employment moves beyond an individual's labor force status. For individuals who are employed, the quality of their employment is a significant predictor of their involvement in crime. Five of the six coefficients representing these relationships between job quality and involvement in violent and property crime were statistically significant. All three factors related to the characteristics and quality of employment significantly influence participation in property crime. Two of the indicators, benefits and work conditions are significantly related to violent crime.

These findings add support to the growing body of literature that uses indicators of employment experiences to help explain individual involvement in criminal behavior (Uggen 1999; Crutchfield and Pitchford 1997; Witte and Tauchen 1984; Sampson and Laub 1990). Individuals who are working in higher quality jobs, with better employment characteristics are more invested in their work and have more to lose if they are caught participating in crime. It is essential to keep in mind that these factors are significant even after controlling for the effects of income, education, previous misbehavior, and family economic status. In fact, these indicators of employment characteristics have stronger and more consistent relationships to criminal behavior than income and overall labor force involvement, two indicators that have dominated much of the research in the area of work and crime.

The finding that part-time employment has no influence on criminal behavior is surprising. However, it is likely that the attributes of part-time employment such as job instability, benefits, limited upward mobility, and less income are being captured more directly by the employment characteristics and income variables. There may not be anything intrinsic about part-time employment that would encourage criminal behavior. To test this possibility, I re-ran the individual-level analysis without the three employment quality characteristics. Even without these variables in the model, part-time employment had no effect on criminal behavior. This suggests that the influence of part-time employment at the macro-level is driven by a contextual mechanism and not an individual-level relationship between part-time employment and crime.

None of the effects in these models are huge. In fact, while we can be confident that the relationships are not zero, many of the findings are quite small. Considering the effects of employment status, and employment quality on both types of crime, the statistically significant relationships range from Beta=.027 to Beta=.059. With a smaller sample we could be much less confident that these relationships were significantly different from zero. However, it is important to note that the standardized effects of being employed on violent crime in Table 4-3 is stronger than the effects of race, family economic status, marriage, and individual income, variables that are commonly treated as important predictors of crime. In the full models in Table 4-4 employment quality is also more important than employment status, family economic status, income, and marriage (in the case of violent crime). These comparisons suggest that despite the fact that employment status and employment quality alone do not explain much of the variance in criminal behavior, they are variables worth considering.

What does this tell us about the aggregate findings?

I started Chapter 4 suggesting that a closer look at the relationship between employment and crime at the individual level might shed light on the aggregate-level relationships reported in Chapter 3. The aggregate findings demonstrated that when including all of the mediating variables in the model, the ratio of retail to manufacturing industry jobs was positively related to property crime, joblessness was positively related to violent crime and negatively related to property crime, and part-time employment was negatively related to violent crime and positively related to property crime. When these labor force participation variables were interacted with the percentage of the population living in urban areas, the effects of both joblessness and part-time employment on property and violent crime varied across counties with different levels of urbanization. Looking at the expected value estimates we saw that in urban areas, joblessness demonstrated a strong positive relationship with violent crime and no relationship with property crime. Part-time employment was positively related to property crime and had no relationship with violent crime. In rural areas, joblessness and had a slight negative relationship with violent crime and a strong negative relationship with property crime. Part-time employment was negatively related to violent crime and had no relationship with property crime.

In the individual-level analysis presented in this chapter, individuals with lower quality jobs were more likely to participate in violent and property crime and respondents with no jobs at all were more likely to participate in violent crime. Concerning the distinction between having a job and not having a job, the individual-level findings are similar to the aggregate findings in urban areas. Not being employed effects violent, but not property crime. To further explore the role of urbanization, I re-ran the individual-level analyses including a dummy variable indicating whether or not the respondent lived in an urban area or not, and interaction variables indicating the multiplicative effects of the variables with this dummy variable. These additions had no

significant effect on crime or on the relationships between the employment variables and crime. This suggests one of two things. Either there is something at the contextual level that in rural areas is decreasing, and in some cases reversing the effect not being employed on violent crime. In other words, the deterrent effect of individual-level employment on crime is constant across urban and rural areas, but some other process is contributing to the aggregate effect. The other possibility is the there is something missing in the individual-level model that is related to the level of urbanization in the county in which the respondent lives. If this was held constant, then the individual-level relationship would only be present in urban areas.

At the aggregate level, the percentage of individuals working part-time was a significant predictor of crime rates. At the individual level, it has no effect. There are a number of possible explanations for these findings. As mentioned above, it may be that the employment quality variables are better indicators of the causal process associated with part-time employment at the aggregate level. In other words, at the aggregate level the influence of employment quality may be being picked up by indicators of part-time employment. The other possibility is that there is something about part-time employment at the aggregate level that influences crime that is not occurring through an individual-level causal mechanism.

What does this tell us about conceptualizing employment?

In addition to offering general support for an age-graded version of social control theory in which investments in conventional activities act as deterrents across the life-course, these findings deepen our understanding of labor market sectors and job characteristics. While adding support to previous research that has looked at the individual-level effect of occupational categories on criminal behavior (Crutchfield and Pitchford 1997, Uggen 1999), by conceptualizing employment in a more multi-dimensional fashion, this work offers further insight

into which aspects of primary sector work, or employment in certain occupations, deter, criminal behavior. The current research suggests that, among other things, it is the lack of; benefits, perceived opportunities, emotional satisfactions, sense of stability; and pleasant conditions that causes some workers to offend at higher rates than others. I propose that it is these types of characteristics which can serve as opportunity costs that encourage investment in employment.

These characteristics are very similar to those listed by labor economists as the distinguishing elements in the primary/secondary sector dichotomy. This link suggests that it is these types of job characteristics that encouraged the higher rates of criminal participation that was found among the wholesale, retail and service employees in the studies by Allan and Steffensmier (1989), Crutchfield (1989), Crutchfield and Pitchford (1997), and Uggen (1999). It is essential that research on employment and crime not be limited to examining strictly monetary factors. It is clear that there is more to the deterrent ability of employment than the paycheck it provides.

Which Type of Crime?

In relating the current findings to other studies that have focused on the relationship between work and crime, there is much agreement and some discrepancy. Findings from the first part of the analysis, suggesting that employment can decrease involvement in violent crime and that being a student can decrease involvement in violent and property crime, are fairly consistent with previous studies of work, school and crime (Witte and Tauchen 1984; Sampson and Laub 1990; Crutchfield and Pitchford 1997). However, it is interesting to note that the strongest, and only significant, difference between the criminal behavior of employed versus unemployed respondents was in the area of violent crime. This, along with the finding that employment characteristics and school involvement were stronger predictors of both types of criminal

behavior than income, again suggests the utility of including non-economic causal mechanisms in theories relating employment and crime.

The current work suggests that while some individuals who are struggling in the labor market may in fact resort to crime to make financial ends meet, this is not the most common process by which employment influences crime. Instead, the findings support a much more multi-dimensional approach to understanding the relationship between the two. Individuals are selected into jobs with varying characteristics. Some of these characteristics generate material, emotional, or psychic rewards that encourage a sense of investment in the job. It is this sense of investment, or commitment, that serves as a deterrent to both expressive and instrumental criminal behavior. Individuals who are employed in positions that offer few characteristics that promote investment, or individuals who are not employed at all, are more likely to feel as though they have less to lose by engaging in criminal behavior. It is not the motivation that is important, but the ability of employment to serve as a deterrent.

In thinking more broadly about the effects of job characteristics, and the policy implications of their relationship to crime, it may be useful to consider their origins. Some of the early approaches to examining the relationship between employment quality and crime (Crutchfield 1987; Allen and Steffensmeier 1987) pointed to the existence of a dual labor market that stratified workers into primary and secondary sectors. Those in the primary sector had opportunities that were unavailable to their secondary sector counterparts, and mobility from the latter to the former was extremely limited. This approach was fueled by large shifts in the U.S. economy resulting in a significant number of primary sector manufacturing jobs disappearing, and being replaced by lower quality, secondary sector positions in the service or retail economy.

This approach is very useful in understanding the changes that have occurred in the labor market but it can also obscure some of the more proximate causes of employment characteristics.

In the twenty to thirty years since the development of dual labor market theory, technological and macro-economic changes have continued to cause shifts in labor market composition and employment characteristics. In many cases, these characteristics are not inherent to the occupation or position of the worker, but are created by employers to keep workers from switching jobs, or by unions who have the power to successfully bargain with employing organizations. While the ability to maximize one's skills, the feeling that significant work is being accomplished, and a pleasant work environment may be strongly related to the objective nature of the job (although certainly employers have some influence over these factors), the vast majority of characteristics comprising the work quality factors are under the direct control of policy makers and management. Therefore, approaches to making unrewarding jobs more satisfying and worthy of an employees investment, need not attempt to shift the global economy. The characteristics that have been demonstrated to be related to criminal behavior could be created within most jobs in a variety of economic sectors.

Conclusion

This chapter offers strong evidence that at the individual level work matters. Involvement in the labor force or other age-appropriate endeavors, and employment characteristics, indicative of job quality, significantly influence participation in property and violent crime. It supports previous research that has used both income and occupational types to predict criminal behavior, but by treating employment in a more multi-dimensional conceptualization adds additional understanding to the work and crime relationship. These findings suggest that the aggregate relationships in Chapter 3 are at least in part driven by an individual-level causal process in which investments in employment act as deterrents to crime.

Chapter 5 uses multi-leveling modeling techniques to combine the aggregate and individual-level data to parcel out the individual characteristics from the contextual effects. As I mentioned in Chapter 1, ecological theories of criminal behavior, along with a small but growing body of research (Wilson 1996; Anderson 1999; Crutchield and Pitchford 1997; Sullivan 1990) suggest that this individual-level relationship between quality of employment and criminal behavior is best understood within the context that it occurs. Scholars and researchers who have studied and written about the macro-economic shifts that have occurred in the post-industrial economy, have suggested that the individual-level relationship between employment and crime may be aggravated by contextual factors such as industrial composition, poverty, joblessness, and widespread occupational marginalization. These issues are explored in Chapter 5.

Table 4-1

Variable Names, Descriptions and Descriptive Statistics For Individual-Level Analysis

Endogenous Variables	Variable Description	Mean	S.D.
Background Characteristics			
Age	*The age of respondent in 1979*	19.67	1.24
Male	*0=Female, 1=Male*	.50	.50
Black	*0=Non-Black, 1=Black*	.237	.426
Hispanic	*0=Non-Hispanic, 1=Hispanic*	.144	.351
Labor Force Status			
Employed	*0=Not Employed, 1=Employed*	.488	.499
College Student	*0=Not College Student, 1=College Student*	.079	.269
High School Student	*0=Not HS Student, 1=High School Student*	.031	.174
Unemployed	*0=Not Unemployed, 1=Unemployed*	.118	.323
Managing Household	*0=Not Managing Household, 1=Managing Household*	.054	.226
Unable to Work	*0=Not Unable to Work, 1=Unable to Work*	.003	.058
Other Status	*0=Not Other Status, 1=Other Status*	.045	.207
In Military	*0=Not Enlisted, 1=Enlisted*	.171	.377
Commitments			
Married	*Marital Status in 1979 0=Not Married, 1=Married*	.180	.384
Education	*Educational Achievement in 1979 0=Less than HS, 1=HS Grad, 2=Some College, 3=College Grad*	1.918	.713
In High School	*High School Enrollment Status in 1979 0=Not Enrolled, 1=Enrolled*	.096	.295
In College	*College Enrollment Status in 1979 0=Not Enrolled, 1=Enrolled*	.233	.423
Own Household	*0=Respondent lives in parents' household 1=Respondent lives in own household*	.351	.477
Previous Delinquency			
School Trouble	*Whether or not the respondent was ever expelled or suspended from school 0=Never Suspended or Expelled, 1=Suspended or Expelled*	.252	.423

Continued on next page

Table 4-1 – Continued
Variable Names, Descriptions and Descriptive Statistics For Individual-Level Analysis

Income			
Individual Income	*Income of Respondent over Previous 12 Months*	2,354	2.030
Household Income	*Total income of Respondent's Household over Previous 12 Months*	13,442	11,167
Employment Involvement			
Part-time Employment	*Worked less than 35 hours per week on average*	.212	.4150
Employment Characteristics			
Employment Quality	*Six Variable Factor – See Appendix One for Listing of Items*	.023	1.021
Benefits	*Two Variable Factor - See Appendix One for Listing of Items*	.266	.940
Bad Conditions	*Two Variable Factor - See Appendix One for Listing of Items*	.101	1.049
Exogenous Variables			
Violent Crime	*Four item scale – See Appendix Two for Listing of Items*	.937	1.498
Property Crime	*Seven item scale – See Appendix Two for Listing of Items*	1.061	2.071

Table 4-2
Correlation Matrix of All Variables Included in Individual-Level Models

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
Background Measures												
V1 Age	1.000											
V2 Male	0.013	1.000										
V3 Black	-.046***	0.000	1.000									
V4 Hispanic	-.032**	0.001	-.228***	1.000								
Employment Status												
V5 Employed	-0.013	.044***	-.097***	.024*	1.000							
V6Unemployed	-.091***	-.039***	.139***	0.002	-.357***	1.000						
V7 College Student	.013	-.015	-.027*	-0.018	-.285***	-.107***	1.000					
V8 High School Student	-.205***	.020	.070***	.051***	-.176***	-.66***	-.053***	1.000				
V9 Managing Household	.029**	-.236***	0.007	.058***	-.233***	-.087***	-.070***	-.043***	1.000			
V10 Enlisted in Military	.174***	.138***	-.040***	-.104***	-.444***	-.166***	-.133***	-.082***	-.109***	1.000		
Commitments												
V11 Married	.194***	-.146***	-.119***	.045***	-.053***	-.026*	-.121***	-.078***	.239***	.083***	1.000	
V12 Educ Achievement	.362***	-.079***	-.086***	-.040***	.078***	-.068***	.301***	-.232***	-.160***	.051***	-.080***	1.000
V13 Currently Enrolled HS	-.380***	.046***	.095***	.037**	-0.015	.049***	-.095***	.552***	-.069***	-.143***	-.140***	.545***
V14 Currently Enrolled College	.029**	-.034**	-.048***	-.040***	0.008	-.141***	.530***	-.099***	-.124***	-.173***	-.203***	-.420***
V15 Live Own Household	.294***	-.171***	-.144***	-0.017	0.001	-.044***	-.024*	-.177***	.199***	0.000	.531***	.079***
Income												
V16 Family Income	-.080***	.035**	-.102***	-.031**	.203***	-.041***	.101***	-.005	-.079***	-.233***	-.060***	.106***
V17 Individual Income	.284***	.239***	-.132***	-.055***	.177***	-.168***	-.164***	-.134***	-.171***	.282***	.141***	.084***
Previous Delinquency												
V18 School Trouble	-.056***	.170***	.157***	-.044***	-.052***	.104***	-.107***	-.007	0.008	.025*	-0.007	-.227***
Employment Involvement												
V19 Part-time	-.091***	-.034**	-.045**	-.019	.546***	-.127***	-.156***	-.096***	-.127***	-.242***	-.087***	.085***
Employment Characteristics												
V20 Rewarding Attributes	0.009	-.025*	-.036**	0.015	.075***	-.007	-.004	-.003	-0.004	-.084***	0.010	-0.005
V21 Benefits	.176***	.106***	0.019	-.053***	-.228***	-.082***	-.066***	-.040***	-.053***	.505***	.110***	0.001
V22 Poor Conditions	.085***	.265***	-0.007	-0.022	-.102***	-.028*	-.022	-.014	-0.018	.205***	.054***	-.095***
Criminal Behavior												
V23 Violent Crime	-.072***	.282***	.071***	-.052***	-.032**	.038**	-.067***	.000	-.061***	.083***	-.060***	-.151***
V24 Property Crime	-.064***	.212***	-.031**	-.030*	0.018	.015	-.031**	-.026*	-.067***	.030**	-.076***	-.072***

Continued on next page

Table 4-2 - Continued

Background Measures	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24
V1 Age												
V2 Male												
V3 Black												
V4 Hispanic												
Employment Status												
V5 Employed												
V6 Unemployed												
V7 College Student												
V8 High School Student												
V9 Managing Household												
V10 Enlisted in Military												
Commitments												
V11 Married												
V12 Educ Achievement												
V13 Currently Enrolled College	1.000											
V14 Currently Enrolled HS	-.180***	1.000										
V15 Living Own Household	-.051***	-.217***	1.000									
Income												
V16 Family Income	.179***	.047***	-.277***	1.000								
V17 Individual Income	-.175***	-.192***	.107***	.118***	1.000							
Previous Delinquency												
V18 School Trouble	-.177***	.016	-0.014	-.080***	.008	1.000						
Employment Involvement												
V19 Part-time	.225***	.128***	-.047**	.117***	-.091***	-.053**	1.000					
Employment Characteristics												
V19 Rewarding Attributes	-.068***	0.004	.024*	.041***	.072***	-.037**	-.102***	1.000				
V20 Benefits	-.264***	-.167***	.049***	-.081***	.367***	0.022	-.448***	.147***	1.000			
V21 Poor Conditions	-.151***	-.056***	0.011	-.054***	.180***	.111***	-.178***	-.094***	.219***	1.000		
Criminal Behavior												
V22 Violent Crime	-.121***	.027*	-.081***	-.031*	.021***	.270***	.005	-.047***	.039**	.153***	1.000	
V23 Property Crime	-.055***	0.006	-.050***	.010	.037	.196***	-.045**	-.052***	-0.011	.088***	.507***	1.000

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

Table 4-3

Multiple Regression Analyses of Criminal Involvement Variables on Background Measures, Commitments, Income, Previous Delinquency, and Employment Status

	Violent Crime N=6460	Property Crime N=6372
Background Measures		
Age	-.069***	-.058***
Male	.237***	.182***
Black	.019	-.072***
Hispanic	-.038**	-.034**
Commitments		
Married	-.007	-.052***
Living in Own Household	-.022	.021
Income		
Family Income	-.018	.014
Individual Income	-.010	-.032*
Previous Delinquency		
School Trouble	.209***	.168***
Employment Status		
Employed	-.042*	-.007
College Student	-.051***	-.030*
High School Student	-.027**	-.041**
Managing Household	- .010	-.022
Enlisted in Military	.019	.006
R Square	.142	.082

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

Table 4-4

Multiple Regression Analyses of Criminal Involvement Variables on Background Measures, Commitments, Income, Previous Delinquency, Employment Status, and Employment Characteristics

	Violent Crime N=6460	Property Crime N=6372
Background Measures		
Age	-.055***	-.057***
Male	.218***	.174***
Black	.018	-.073***
Hispanic	-.043***	-.039**
Commitments		
Married	-.027	-.062***
Educational Achievement	-.063***	-.015
Currently Enrolled College	-.051**	-.058**
Currently Enrolled HS	-.038*	-.030
Living in Own Household	-.013	.024
Income		
Family Income	-.002	.023
Individual Income	-.001	-.032*
Previous Delinquency		
School Trouble	.190***	.157***
Employment Status		
Employed	-.046	-.008
College Student	-.011	-.001
High School Student	-.020	-.031
Managing Household	- .023	-.029*
Enlisted in Military	.012	.007
Employment Involvement		
Part-Time Employment	-.008	-.004
Employment Characteristics		
Rewarding Job Attributes	-.023	-.037**
Benefits	-.033*	-.040**
Poor Conditions	.059***	.028*
R Square	.152	.090

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

Chapter 5: Nested Models of Work and Crime

Chapters 3 and 4 proposed and empirically examined two routes by which employment may influence criminal behavior. Following in the footsteps of the majority of the research in the area of employment and crime, Chapter 3 suggested that aggregate rates of labor market participation can influence the rates of both violent and property crime in a large sample of counties in the United States. The use of interaction terms that combined labor force indicators with the percentage of the population living in urban areas showed that both unemployment and part-time employment have more consistently detrimental effects on the crime rates in more urban counties. In addition to focusing on the effects of labor force involvement, the model examined in Chapter 3 demonstrated how industrial composition, measured as the ratio of retail industry to manufacturing industry jobs, could be viewed as an important antecedent to labor force participation. The industrial composition of a county influences labor market participation, which influences crime rates. Industrial composition also has a direct relationship on crime at the aggregate level.

This model is supportive of some of the previous work in the area and adds a new dimension to the literature by tracing the effects of labor force participation back to the macro-economic forces that drive the labor market. However, as with previous aggregate-level research we are left with a number of questions concerning the causal mechanism by which aggregate-level industrial composition and labor force involvement influence crime rates. The possible causal mechanisms fall into two categories. The first category includes individual-level processes that link an individual's work experience to their participation in criminal behavior. If individuals who are unemployed or on the margins of the labor force are more likely to participate in crime because they feel they have less to lose and there are more individuals in a given area who are

unemployed or marginally employed we would expect this area to have a higher rate of crime. If the relationship observed in the aggregate data is driven by such a process, then the aggregate relationship can be explained by an individual-level process that is observed across a group of aggregated individuals. Most aggregate-level studies of the employment crime relationship draw on such individual-level explanations to explain their findings. This type of explanation is both intuitively appealing and has received a fair amount of support from research using individuals as the units of analysis.

The findings from the individual-level analyses in Chapter 4 suggest that the aggregate-level relationship between labor market characteristics and crime rates identified in Chapter 3 is, in part, the result of individual processes aggregated up to the county level. The individual analyses in Chapter 4 move beyond considerations of unemployment versus employment and proposed a model that, in addition to employment status, includes part-time employment as well as three factors representing important job characteristics. These characteristics, acting as indicators of employment quality or investment in work, can also be thought of as the micro-version of labor market opportunity. Part-time employment had no influence on crime, but the three employment characteristics were significantly related to individual levels of participation in property and violent crime. Along with a growing body of research, these findings suggest that individual employment matters, and that the relationship often found in macro-level research connecting aggregate-level labor force participation to crime rates can be partly explained by a casual process occurring at the individual level.

Despite its intuitive appeal and the support demonstrated at the individual level, we should not assume that the aggregation of individual-level relationships is the only process driving the macro-level relationship. The fact that part-time employment did not influence crime at the individual level but did at the aggregate level suggests that there is not a perfect

relationship between the individual and aggregate-level effects. The ecological fallacy warns that in using aggregate data we cannot be sure that the individuals who are on the margins of the labor force are the only individuals who are adding to the crime rates. It may be that county-level labor force participation has some effect on all individuals, both the employed and the unemployed.

When a relationship between employment and crime is found using individual-level data, we can be confident that it is caused by an individual-level causal mechanism. For instance, if individuals with certain characteristics are found to be more involved in crime, we can be confident that there is something about those individual-level characteristics (or other unobserved but related characteristics) that can explain this relationship. However, when relationships are established using aggregate data it can be unclear whether characteristics of the place, or characteristics of the individuals living in the place are driving the relationship. The idea that there may be area effects that cannot be traced down to individual characteristics suggests the possibility of the second category of causal mechanisms that may help explain the aggregate-level relationship between labor force participation and crime rates. This category of mechanisms is often referred to as contextual effects.

Contextual Effects

Contextual effects imply that there is something about the context in which individuals live apart from their own characteristics that can influence their behavior. One of the best examples of this in the criminology literature is Sampson's work on residential burglary and intact families (Sampson 1987). Sampson argues that the causal process causing neighborhoods with a high percentage of single-adult households to have higher rates of burglary has to do with the relationship between household types and neighborhood guardianship. It is not simply that people living in single-adult households are more likely to be the victims or perpetrators of

burglaries (although the former was also found to be true). Single-adult households are less likely to have someone at home who can act as an informal neighborhood supervisor. Large percentages of single-adult households create a context (a lack of guardianship) that increases burglary opportunities. These opportunities are independent of the characteristics of the individual households.

The findings from the individual-level analysis in Chapter 4 show significant relationships between individuals' work characteristics and their criminal behavior. This suggests that at least part of the aggregate-level relationship examined in Chapter 3 connecting crime rates to industrial composition and labor force participation is the result of individual-level relationships being grouped at the aggregate level. It is also possible that the county context created by industrial composition and level of labor force participation influences criminal behavior above and beyond the individual-level relationships between individuals' work experiences and their criminal behavior.

The aggregate-level analysis also demonstrated an important relationship between rates of part-time employment and rates of crime. This relationship did not exist in the individual-level analyses. Counties with higher levels of part-time employment demonstrated significantly higher rates of property crime and lower rates of violent crime, but individuals working part-time did not indicate significantly different levels of participation in either type of crime. This suggests that there may be a mechanism connecting part-time employment to crime at the county level that does not operate through individual part-time employment. The goal of this chapter is to determine whether such contextual effects exist, and if they do, how they influence individual participation in crime.

Why Context Matters When Considering Employment and Crime

Two contextual-level explanations have been predominant in the employment and crime literature. The first one, stemming from the routine activities and crime perspective (Cohen and Felson 1980), focuses on how context can shape the opportunities to commit crime by influencing the availability of possible targets, victims, and accomplices. Economic factors such as labor force involvement and community organization can influence context by affecting the temporal and spatial patterns of human activity which create such availability. While the causal process is different (economic factors versus household composition) this approach is similar to Sampson's reasoning discussed above (1987) in that it attempts to connect area characteristics related to the spatial distribution of human activity with opportunities to participate in crime.

The routine activities and crime perspective has been used to explain both positive and negative relationships between labor force involvement and crime. In areas with high unemployment more people are at home during the day, leaving fewer empty houses. As occupied houses are perceived as less desirable targets by burglars, unemployment may lead to a decrease in burglary. However, high rates of unemployment or marginal employment may also allow larger numbers of young adults whose behavior is not influenced by occupational investments to spend more time in unregulated social spaces such as street corners, parks, arcades, and bars (Crutchfield 1989, Crutchfield and Pitchford 1997). These public social gatherings can put potential offenders in contact with motivated accomplices, as well as possible targets or victims. The routine activities and crime perspective does not address the role of motivation, but focuses specifically on how context can increase or decrease the relative opportunity to participate in crimes.

The second contextual explanation, which has received attention from both the labor market and crime perspective, and those studying underclass phenomena, focuses on how

perceptions of legitimate opportunity created by contextual factors can influence decisions concerning criminal behavior. Individuals living in areas with fewer employment opportunities, as evidenced by high levels of unemployment, part-time employment, or lower quality jobs, may feel that they have less to lose by participating in law-breaking behavior. If there are fewer employment opportunities in the community that are put in jeopardy by violating the law, there are fewer reasons to abstain from crime. This perception of opportunity and the influence it has on other decisions may occur regardless of or in combination with an individual's actual employment experience.

However, an alternative hypothesis is that for individuals who are gainfully employed poor opportunity structures may act as a deterrent to crime. If finding new employment would be difficult, then the employed individuals have even more to lose by participating in behavior that could jeopardize their job. Both rationales suggest that perceptions shaped by context may be important. Whether the effects are similar for all individuals, or vary by individual characteristics is an empirical question.

While conceptually distinct, these two contextual explanations related to opportunity and perceptions have been used in combination to address the overall effect of aggregate-level joblessness and marginal employment on crime. In a study of Seattle census tracts that found an aggregate-level relationship between marginal employment and violent crime, Crutchfield (1989) suggested that this relationship is influenced by the concentration of marginally employed individuals spending time in unregulated social space. Concentrations of marginal employment in this case were seen as both altering the spatial distribution of human activity in a manner conducive to criminal opportunity, and increasing individual motivation based on perceptions of opportunity and investments in conformity. Unfortunately, due to the nature of the data he was

unable to empirically test whether the findings were aggregated individual effects, or true contextual effects.

Using individual-level data from the NLSY79, along with county-level labor force variables, Crutchfield and Pitchford (1997) found a positive relationship between employment instability and participation in violent crime among respondents living in areas with high concentrations of marginally employed individuals. Because both individual and aggregate-level work variables were included in this analysis, we can be more confident that these findings represent a contextual effect, and cannot be reduced to individual-level processes. Again, the distribution of activity and perceptions of limited labor market opportunities were drawn on to explain the relationships.

In his writings on the underclass, Wilson focuses less on opportunities to commit crime and more on the perceptions of opportunity that are influenced by context (Wilson 1987, 1996). Perceptions of limited opportunity may act to increase crime by hampering the development of investments in employment, serving as a substitute to legitimate employment, or as a response to the frustration such perceptions may engender.

Main and Interactive Contextual Effects

Contextual factors may influence individual-level criminal behavior in two ways. First, after controlling for individual-level employment and other influential characteristics, county-level variables such as industrial composition, unemployment, or part-time employment may have a significant effect on individual participation in crime. If this is the case, we could say that the county characteristics have a direct effect on individual criminal behavior. Given that individual-level employment characteristics were held constant in the equation, we can be confident that this relationship represents a true contextual effect, and is not the result of

aggregated individual-level processes. To address whether the causal mechanism driving the contextual effect was related to increased criminal opportunity, heightened motivation as a result of perceptions of legitimate opportunity, or some other factor, we would need to include measures of these concepts in the model.

Contextual factors can also interact with individual-level characteristics to influence individual criminal behavior. For instance, the inverse relationship between employment quality and crime at the individual-level may be stronger in areas with higher rates of unemployment. Individuals with low quality jobs may feel like they have *even less* to lose if their perceptions suggest that the general opportunity structure of the area is weak. The influence of other individual variables may be affected as well. As mentioned above, this interactive relationship could also be the result of individuals with weak bonds to the labor market being in close proximity to a large number of similarly bonded individuals, thus increasing criminal opportunities. Interaction effects between individual and area-level characteristics suggest that the main individual effects are not fixed but vary across the different contexts, and that area-level characteristics can explain some or all of this variation.

The Questions to be Addressed

A number of the questions that have been brought up in this and previous chapters will be empirically addressed in the following analysis. First, the degree to which county-level characteristics influence individual-level criminal behavior will be explored. This examination will address one of the main questions left unanswered in Chapter 3. By holding constant individual work experiences when regressing individual-level crime on county-level factors we can determine whether any of the county characteristics included in the model are having a true contextual effect on individual crime. If there is no effect of context on individual crime when

individual-level employment characteristics are included in the model, this would suggest that the aggregate-level relationship demonstrated in Chapter 3 is being driven solely by individual-level processes. If one or more of the aggregate-level factors are significantly related to individual-level crime, after controlling for the individual-level characteristics, the model provides support for the existence of contextual effects that cannot be explained by characteristics of the respondents who live in the area.

The model discussed in Chapter 4 will also be illuminated. First, I will expand on the individual-level model by examining whether contextual effects increase our ability to explain individual crime. Second, I will determine whether the relationships between individual-level factors and crime are constant, or if they vary across different labor market contexts. If they are constant across the different contexts then the individual relationships are independent of the characteristics of the areas in which they occur.

Unfortunately due to a lack of indicators, I will not be able to address or test the different proposed causal factors which may drive any existing contextual effects. The NLSY79 does not include indicators of the respondents' perceptions of local labor market opportunity, or the degree to which criminal opportunities vary across the counties.

Hypotheses

Main Effects

The labor market and crime perspective as developed by Crutchfield (1989) and Crutchfield and Pitchford (1997) proposes that labor force marginalization will increase crime at both the aggregate and individual level. At the aggregate level, weak labor force involvement is considered conducive to crime because it creates perceptions of limited opportunity while enabling large public congregations of young individuals with fragmented labor force

attachments. Perceptions of weak opportunity may increase motivation for crime and public congregations facilitate the connection of potential offenders with possible accomplices and victims. In that the proposed aggregate-level effect is not dependent on the characteristics of the individual respondents, it can be considered a true contextual effect.[1]

Strong theoretical arguments, significant relationships at the aggregate level, and Crutchfield and Pitchford's research that found a small contextual effect using product terms to represent the interaction between individual and aggregate-level characteristics all suggest that context may play a role in explaining individual-level crime. I hypothesize that the current analyses will support the idea that contextual characteristics matter by showing the contextual variables to have significant direct effects on individual crime. While aggregate-level labor market variables may influence both violent and property crime, I expect the findings to be stronger and more consistent for violent crime.

When considering property crime, weak labor force attachment at the aggregate level may both encourage and discourage criminal activity. Perceptions of weak opportunities, and large congregations of individuals not attached to the labor market, may both increase motivation and facilitate the planning and execution of property crime. However, property crime may be more dependent than violent crime on opportunity and the availability of desirable targets. Fewer empty households and less conspicuous consumption (both the result of depressed labor markets) may act to discourage property related criminal behavior. The effects of weak labor markets on individual-level violent crime are apt to be more consistent, as such behavior is also influenced by labor market perceptions and public congregations, but is less dependent on specific opportunities or targets.

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[1]It is possible that unobserved individual heterogeneity could explain what would appear to be a contextual effect. However, if this individual level model is correctly specified, this possibility is minimized.

It is also expected that weak labor markets will have a stronger effect on crime in urban versus rural areas. In areas with low labor force involvement, concentrations of individuals who are not attached to the labor market are apt to be more intense in urban areas as a result of higher population density. These concentrations will influence both perceptions and public congregations. There are also likely to be more targets for both violent and property crime in urban areas. As discussed in Chapter 3, fewer of the targets in urban areas will be residential; hence joblessness may have less of an influence on guardianship. Three hypotheses follow from this discussion:

H1: Holding constant individual-level characteristics, weak labor markets, as measured by industrial composition, joblessness, and part-time employment will have a positive influence on individual-level criminal behavior.

H2: The relationships between weak labor markets and crime will be stronger for violent than for property crime.

H3: The relationships between weak labor markets and crime will be stronger in urban versus rural areas.

Fixed vs. Random Effects

In addition to determining whether the contextual variables have direct effects on individual-level crime, the multi-level models will estimate the extent to which individual-level relationships vary across contexts. As the analyses in the previous chapters focused primarily on individual-level factors that represent types of investments and commitments that may deter

criminal involvement, this part of the analysis will focus on the cross-context variation among the relationships pertaining to work and school. There are two main questions concerning the variance of individual-level relationships across the different contexts. First, do they vary? Second, if they do vary, can their variation be explained by contextual characteristics?

I expect many of the relationships in the individual-level model to vary across the counties. In this analysis the context of interest is primarily the local labor market. County is serving as a proxy for this unobservable aggregate structure. The individual-level relationships do not take place within a vacuum, but are aggravated and mitigated by the macro-social forces which shape the context in which they develop. It is hypothesized that weak labor markets, indicated by high levels of joblessness, part-time employment and the ratio of retail industry to manufacturing industry jobs, will decrease the relationships between employment characteristics, educational achievement, and crime. In other words, investments in work and school will serve as stronger deterrents to crime in areas with better opportunity structures and will have less of an effect on crime in areas characterized by weaker opportunity structures. In general, educational achievement and quality employment are viewed as tools for upward mobility. If this is not the case, and such investments do not lead to better opportunities, they will be less influential in deterring criminal behavior. Conversely, weak attachments to work and education will be especially conducive to crime in areas with fewer legitimate opportunities. In such situations, neither the individual's current situation nor credentials, nor the general labor market climate offer much that would discourage the pursuit of more instant gratification that may be associated with criminal behavior. Thus, we can state this argument in the form of two hypotheses:

H4: The relationships between individual work experiences and educational achievement, and involvement in crime identified in Chapter 4 will vary across contexts.

H5: The labor market characteristics of the counties will explain part of this variation. Indicators of weak labor force opportunities will decrease the deterrent effects of investments in conforming lines of behavior.

Research Strategy

Contextual effects have been explored and discussed in the empirical literature using a variety of techniques. The most problematic research designs are those that rely on data drawn entirely from aggregate sources. As discussed above, the exclusive use of aggregate data makes it empirically impossible to differentiate between individual and contextual-level causal mechanisms. In these cases, unless strong theoretical arguments can be made which rule out individual-level causal processes, claims of contextual effects remain suspect. A more conservative approach would make the assumption that area-level effects are caused by "aggregating up" individual-level processes.

Another approach that has been used has been simply to regress individual-level dependent variables on both aggregate and individual-level exogenous variables representing equivalent phenomena at different levels of analysis in the same model. Assuming that the individual-level variables can act as controls for the individual-level causal process, any significant effects of the aggregate factors can be considered contextual. Interaction terms including individual and aggregate-level variables can be added to the model to determine whether the individual-level relationships vary across the different contexts. This type of model was used in Crutchfield and Pitchford's (1997) work discussed above.

While this approach is a substantial improvement over models which make contextual claims when only analyzing aggregate data, it violates a major assumption of ordinary least

squares regression and causes the parameters to be inefficient and biases the standard errors. One of the assumptions of OLS is that each of the observations is independent and therefore the error terms are uncorrelated. When area-level variables are appended to individual cases any error will be correlated with the error of all of the other observations from the same geographical area.

Perhaps the most effective approach to addressing these problems is to use multi-level modeling techniques. One software package designed for this type of analysis is HLM (Bryk and Raudenbush 1992). The main advantage of HLM is its modeling of the structure of the error variance. By separately estimating individual and county-level errors, the program adjusts for the correlated errors thus addressing the lack of independence among respondents within the same county. In addition to correcting for correlated error structures, HLM has a number of other features that are useful in exploring the multi-level relationships between work and crime. It allows individual-level relationships to be treated as random or fixed, measures the degree to which individual relationships vary across contexts, and allows users to model the structure of the cross-context variance in parameter estimates.

Multi-level modeling approaches have been used most extensively by social scientists researching educational outcomes (Bryk and Raudenbush 1986; Gamoran 1992). The models were developed to parcel out the relative influence of individual characteristics, classroom characteristics, and school characteristics on outcome variables of interest. This approach can be thought of as nesting individuals within classrooms, which are nested within schools. In the current analysis, I nest individual workers within larger county labor markets. Using this technique I can examine the effects of both individual-level factors (such as work characteristics and education), and county labor market characteristics (such as industrial composition and joblessness) on individual-level criminal behavior. It can also be determined whether the county-level characteristics explain the slopes of the individual-level relationships. Raudenbush and Bryk

(1986) refer to this last type of analysis in which contextual-level variables explain cross-context variation as "slopes as outcomes".

I use HLM to estimate the multi-level models. The program models multi-level effects by estimating two equations simultaneously for each of the models. The first equation examines the effects of independent variables on the outcome variables within each of the contexts in the sample. If there were only one independent variable it would take the following form:

$$Y\,ij = \beta oj + \beta 1j\, X1ij + eij$$

Where *Yij* is the observation on the outcome variable for the *ith* case in context *j*. βoj is the individual-level intercept for context *j*. $\beta 1j$ is the slope in context *j* for the first independent variable which is represented by *X1ij*. The error term for the *ith* case in context *j* is represented by *eij*.

This analysis is similar to the ordinary least squares equation presented in Chapter 4, except that the coefficients representing the individual-level relationships are not fixed, but are allowed to vary across the different counties. This process generates a coefficient indicating the effect of the independent variable(s) on the outcome variables in each of the different contexts. The coefficient(s) given can be thought of as the average effect of the independent variable on the dependent variable across all of the different contextual units holding constant all of the other independent variables.

The second equation is the cross-county equation in which involvement in violent and property crime are regressed on county characteristics. This is analogous to an equation in which an individual-level dependent variable is regressed on a set of aggregate-level independent variables. It has the following form:

$$\beta oj = \gamma oo + uoj$$

where βoj is the individual-level intercept in context *j*, γoo is the mean value of the individual-level outcome across all of the contexts, and u*oj* is the random effect of context *j*. This random effect could be made up of several contextual-level variables. This equation indicates the degree to which the individual-level intercepts in the first equation vary across the sample of contexts. Additional equations could also be added which model the slopes in the individual-level equation such as:

$$\beta 1j = \gamma 1o + uoj$$

in which $\beta 1j$ represents the slope of one of the independent variables, $\gamma 1o$ is the mean value of the slope across all of the contexts and u*oj* is the random effect of context *j*. These equations are all computed simultaneously.

The Data

The data used in the models are the same data used in Chapters 3 and 4. The aggregate-level data come from the 1980 U.S. Census of Housing and Population and the 1981 Uniform Crime Reports. The individual-level data come from the 1979 and 1980 waves of the National Longitudinal Survey of Youth. In the individual-level models in Chapter 4 all NLSY respondents age eighteen and over were included in the analysis. In the aggregate-level models in Chapter 3 all counties in which at least one adult NLSY respondent resided were included in the analyses. The geo-codes available with special permission from the Bureau of Labor Statistics allow the connection of the individual-level respondents with the counties in which they lived. The sample used in the individual-level analyses in Chapter 4 included six thousand four hundred and sixty (N=6460) respondents. The sample used in the aggregate analyses in Chapter 3 included five hundred and forty five (N=545) counties.

Due to restrictions in the data and the requirements of multi-level modeling techniques, some adjustments had to be made to these two samples. First, the NLSY does not provide geo-codes for respondents currently serving in the armed forces (N=1215). Because HLM cannot adjust or impute values for contextual-level variables and therefore no county information could be included for these cases they were dropped from the analysis. HLM also requires a certain number of individual units in each of the contexts in order to estimate individual and contextual effects. I excluded all of the respondents who lived in counties with fewer than ten respondents (N=392 counties, and N=1144 respondents. This exclusion decreased the number of counties to one hundred and fifty eight (N=158) and the number of respondents to four thousand seven hundred and forty two (N=4742). Table 5-1 shows the means and standard deviations of the variables for both the cases that are included in the multi-level analyses and for those cases that were excluded because there were less than ten respondents from the county, or due to enlistment in the armed forces. Table 5-1 also includes the results from a test for significant differences between the means.

There are a number of significant differences between the entire sample that was used in the previous two chapters and the reduced sample used in the HLM models. The respondents in the HLM sample are about the same age as those in group 2 (respondents who lived in counties in which fewer than 10 respondents resided) and about six months younger than those respondents in the military. Those in the HLM sample are more likely to be black and more likely to be enrolled in high school than either of the other two groups. They are less likely to be enrolled in college than those in group 2, but more likely than those in the military. They tend to have slightly lower overall levels of educational achievement than either of the other two groups. They are more likely than respondents in group 2, but less likely than those in the military, to have been suspended or expelled. Their average income is significantly less than the respondents in the

military but about the same as those in group 2. They are more likely to be employed in civilian jobs than respondents in either of the other two groups and are less likely to be students than those in group 2.

Their employment characteristics are similar to those respondents in group 2. They tended to have more rewarding job attributes and work in better conditions than those respondents in the military, but reported lower levels of benefits. They had similar rates of participation in property and violent crime as those respondents in group 2, but reported lower levels than respondents in the military. The characteristics of counties were not as distinct. Counties that were included in the HLM sample were more urban, had higher levels of disorganization, and lower rates of part-time employment. Industrial composition, joblessness, and levels of segregation were not significantly different. No county information is available for the respondents in the military.

Creating a sub-sample through non-random systematic selection threatens our ability to generalize the findings as our sample is no longer a representative sample and may introduce sample selection bias. As much of the discussion of employment has been based on civilian employment, I am less concerned about dropping respondents in the military from the multi-level analysis. As discussed earlier, the NLSY over sampled urban, minority and disadvantaged populations. The most important individual-level differences between the sample used in Chapter 4 and the sub-sample used in the HLM analyses is that the respondents in the latter sample are less likely to be in college, more likely to be black, more likely to have been suspended or expelled, and tend to have less education. The most important differences between the county characteristics is that those included in the HLM sample are more urban, more disorganized and had lower levels of part-time employment. For the most part, this sample further over-samples those individuals and counties that the NLSY over-sampled in the first place. As the focus of the

analysis is on the influence of labor market opportunities on the criminal behavior of young adults, controlling for education, employment and background characteristics, I do not think that using this sub-sample will significantly bias the results.

Analysis and Results

I estimated seven HLM models for each of the criminal involvement variables. The first model is the baseline random effects model that produces estimates for the average within-county relationships between the respondents' characteristics and their participation in criminal behavior. The parameter estimates can be thought of as averages because they are allowed to vary across the different counties. The coefficient generated is the average effect of the independent variables across the sample. This model also estimates the variance components for the parameters. The variance components represent the degree to which the individual-level parameters vary across the sample of counties or how much variance in the individual relationships is due to between versus within county differences. Model 2 treats industrial composition, joblessness, part-time employment, social disorganization, and segregation as predictors of the intercept for the equation in Model 1. These effects could also be thought of as the direct effects of county-level characteristics on crime. Model 3 is similar to Model 2, but also includes product terms representing the interaction between industrial composition and urbanization. The inclusion of product terms allows us to determine whether the influence of county-level labor force characteristics on individual-level participation in violent and property crime may differ in urban and rural areas. Models 4 and 5 include interaction terms representing the multiplicative effects of urbanization and percent jobless and percent part-time respectively. Model 6 includes all of the interaction terms in the same model.

Model 7 is actually a set of models. Each of the models includes both the within (individual-level) and between-county (county-level) predictors of individual-level criminal behavior. They differ from Model 3 in that each model also uses county-level labor force variables as predictors of the variance of a specific individual-level parameter.[2] Prediction of the variance components is modeled for the intercepts related to individual investment and commitment which Model 1 showed to differ significantly across the sample of counties. In other words, these models test whether county labor force variables can explain some of the inter-county variation among the parameters relating investments in employment and education to participation in violent and property related crime.

Model 1 – The Baseline Model

The baseline models, presented in Table 5-2 look very similar to the individual-level models presented in Chapter 4. They demonstrate the importance of a variety of individual-level variables, especially those related to investments in work and crime. With the exception of educational achievement in the case of property crime, all of the variables related to current enrollment and educational achievement are negatively related to participation in crime. The finding that being a student as one's primary activity (the reference group being not working, not in school, and not managing a household) is not related to either type of crime is most likely the result of the correlations between being a student and the two measures of academic enrollment (r= .206 and r=.367 respectively for high school and college enrollment). Both of these other measures are statistically significant.

[2] I tried to run this set of models as one model, generating estimates of the effects of county characteristics on all of the individual-level parameters related to investment and commitment simultaneously. This caused instability in the estimation procedure. The resulting parameter estimates and their standard errors are suspect.

All of the variables representing quality employment characteristics, or investments in work, with the exception of rewarding job attributes in the case of violent crime, have statistically significant negative relationships with criminal involvement. Being employed is not significantly related to participation in crime when compared to not being employed. As in the ordinary least squares models this relationship is most likely non-significant because the attributes of jobs that cause employed individuals to commit fewer crimes than unemployed individuals are being controlled for by including the indicators of job quality. The other type of role that involves substantial investment and commitment to conforming behavior, managing a household, is significantly and negatively related to involvement in both property and violent crime. Part-time employment at the individual level does not have any influence on participation in crime.

The average effects representing the relationships between criminal behavior and education and employment in the HLM model offer further evidence that the investments and commitments that individuals have in conforming lines of behavior can influence their consequent decisions concerning law-violating activity. Those who are involved in further developing their human capital through education and those who are invested in rewarding jobs or who are focusing on managing a household demonstrated lower levels of involvement in both violent and property crime. This differs from the ordinary least squares model in Chapter 4 only in that managing a household did not have a significant effect on violent crime when examined in OLS. By allowing this parameter to vary across different contexts the average effect has become significantly different from zero.

An examination of the variance components estimated in Model 1 for the relationships between educational and employment investments and crime shows that only a small number of these relationships vary across counties. The variance components and their chi-square values are listed in Table 5-3. When examining the inter-county variance in the model predicting violent

crime the findings show that of the ten variables that indicate investments and commitments in education and work, only the coefficients representing the effect of being employed, working part-time, and educational achievement vary significantly across the sample of counties. For property crime, the effects of individual income, being employed, working part-time, and managing a household vary significantly across the sample of counties.

Overall, this between-county stability indicates that the deterrent influences of many investments and commitments that people make have the same effect no matter where individuals live. In other words, many of these bonds to conformity or investments in conventional lines of action work equally well across a wide variety of economic and labor market contexts. However, consistency across contexts is only one part of the story. The effects of being employed, working part-time, managing a household, individual income, and educational achievement do exhibit a significant amount of variance between counties in one or both of the individual-level equations predicting violent and property crime. For these relationships, characteristics of the county, observed or unobserved, significantly influence the degree to which investments and commitments influence behavioral outcomes related to crime. Whether or not this variance can be explained by county labor market characteristics is explored in Model 7. These findings offer partial support to ***H4,*** which predicted that the relationships between individual investments and crime would vary across contexts.

Models 2 and 3 – The Direct Effects of Context on Individual Criminal Behavior

Models 2 through 6 in Table 5-4 address the question of whether the industrial composition, labor force participation, social disorganization, segregation, and urbanization variables that were significant predictors of aggregate crime rates in Chapter 3 will directly influence individual-level participation in crime after controlling for individual-level

characteristics. This is a test of whether these macro-economic and structural characteristics do in fact exhibit contextual effects on individual criminal behavior. If these parameters are significantly different from zero than the hypothesis predicting direct contextual effects is supported. This would add strength to the claim that the aggregate-level relationships reported in Chapter 3 were at least in part due to contextual effects and not simply the result of individual-level causal processes operating within a group of aggregated individuals. In order to display Models 2 through 6 on one page, I have only listed the coefficients representing the effects of the county-level variables. The individual-level relationships remain virtually unchanged across the models.

The estimated parameters for the models predicting violent and property crime suggest that labor market context can influence the criminal behavior of individuals. Model 2 predicts the effects of individual and county-level characteristics on violent and property crime. The findings suggest that none of the county-level variables are related to individual-level violent crime and that only the proportion of the population that is jobless has a significant effect on individual participation in property crime. This effect is negative. Respondents living in counties with high rates of joblessness indicated lower rates of participation in property crime.

These findings offer no support to the first hypothesis (*H1*) suggesting that weak labor markets would increase individual-level involvement in violent crime. Instead, the best indicator of a weak labor market, joblessness, had a negative effect on property crime. These findings however are consistent with the results in Chapter 3, which found that rates of joblessness are negatively related to property crime. It was suggested that this relationship can be explained by the influence joblessness has on property crime opportunities by increasing guardianship and decreasing the number of targets.

Model 3 in Table 5-4 demonstrates that the interaction term representing the multiplicative effects of industrial composition and urbanization has no significant influence on individual participation in violent or property crime. Joblessness continues to have a negative effect on property crime and none of the other variables have a significant influence. In Model 4 the interaction term representing the combination of jobless and urbanization has a positive effect on property crime while the multiplicative effects of industrial composition and urbanization are significant and negative. This suggests that in urban areas, the negative relationship between county rates of joblessness and individual-level participation in property crime, holding constant individual-level employment experiences and characteristics, is significantly weaker. Again, this agrees with the aggregate-level analysis in Chapter 3. Figure 5-1 graphs the change in the expected values of individual property crime for individuals living in counties with different levels of joblessness and urbanization. As discussed in Chapter 4, the indicators of participation in violent and property crime are truncated frequencies based on responses to specific questions concerning how many times and individual participated in each type of crime. Figure 5-1 shows that in rural areas, a two standard deviation change in joblessness (moving from a county in which 37.6% of the adults are jobless to a county in which 50% of the adults are jobless) is accompanied by about a 52% reduction in the average respondent's participation in property crime. A similar shift in joblessness has virtually no effect on respondents living in more urbanized counties. Once joblessness is held constant, the ratio of retail to manufacturing jobs has an inverse relationship with individual-level property crime. When examining violent crime, none of the county characteristics included in Model 4 demonstrate significant effects.

Model 5, which includes the interaction term representing the multiplicative effects of urbanization and part-time employment, is similar to Model 4. In urban areas, after controlling for individual-level employment experiences and characteristics, the percentage of the workforce that is employed part-time significantly increases individual participation in property crime. Again, the county-level variables have no influence on violent crime. Figure 5-2 graphs the expected values of individual property crime for the average respondents in counties with different levels of part-time employment and urbanization. In highly urban counties a shift in part-time employment from 33% of the labor force to 41% of the labor force (from one standard deviation below to one standard deviation above the mean) is accompanied by a 22.5% increase in the average property crime participation level. A similar shift in part-time employment in an entirely rural area would be accompanied by an 11% increase in the average property crime participation level. These changes suggest that part-time employment will have more of an effect on individual -level property crime in urban areas than in more rural areas. These findings support both ***H1***, which suggested that indicators of weak labor markets would increase individual involvement in crime and ***H3*** which proposed that this effect would be more significant in urban areas. This corresponds with the aggregate-level findings.

Model 6 in Table 5-4 includes all of the interaction terms representing the multiplicative effects of the labor force participation variables and the percentage of the population living in urban areas. In both the violent and property crime equations, the interaction term representing the product of the percentage of the population living in urban areas and the percentage of the population that is jobless has a significant positive effect on individual-level participation in crime. These findings offer additional support to ***H1*** and ***H3***. Individuals living in areas with high joblessness were more likely to participate in violent crime if they were also living in urban areas. In fact, Figure 5-3, which shows the expected levels of individual involvement in violent crime in

counties with varying levels of joblessness and urbanization, illustrates an interesting relationship. County joblessness increases the average level of participation in violent crime for respondents living in urban counties and has the opposite effect for respondents living in rural counties.

Model 6 also shows that individuals living in counties with high joblessness were less likely to participate in property crime, but this relationship decreased significantly if they were also living in urban areas. This is similar to the relationship illustrated in Figure 5-1 (before the interaction between proportion of the workforce working part-time and urbanization were added to the model.

Once the joblessness and urbanization interaction is included in the equation, the interaction term representing the multiplicative effects of urbanization and part-time employment has a significant negative effect on individual involvement in both violent and property crime. After holding joblessness constant, individuals living in urban counties with high levels of part-time employment commit fewer crimes. The interactive effect of industrial composition and urbanization also has a negative effect on property crime when the other interaction variables are included in the equation. These findings run contrary to the hypothesis suggesting that measures of weak labor force opportunity would be positively related to individual-level involvement in crime. However, it should be noted that without controlling for the interaction between urbanization and joblessness, individuals living in counties with high rates of part-time employment had significantly higher rates of involvement in property crime (illustrated in Table 5-2). This is consistent with the findings in the aggregate-level analysis.

This shift in the direction of the relationship suggests two possibilities. First, the interaction terms are highly correlated, and including them both in the model introduces bias into the analysis. We can see in Table 3-2 in Chapter 3 that the interaction terms representing

joblessness and urbanization, and part-time employment and urbanization have a correlation of r=.968. Second, once joblessness is held constant, part-time employment, and industrial composition may not serve as good measures of weak labor force opportunity. It may be that after holding joblessness constant, the other observed labor market characteristics may be acting as indicators of some other aspect of the economic structure of the local economy. This possibility and its implications for future research will be discussed below. Overall however, these findings offer solid support to the claim that regardless of their own employment experiences and characteristics, individuals living in counties with weak labor force opportunities tend to participate in more violent crimes and fewer property crimes. The increase in participation in violent and property crimes is stronger in urban areas and the decrease in participation in property crimes is stronger in rural areas. For the most part these findings are consistent with the patterns suggested in Chapter 3.

Model 7 - Explaining the Inter-County Variance

As mentioned earlier, there are two ways that labor force characteristics at the county level could influence individual participation in criminal behavior. First, holding constant the characteristics of the individual, labor force characteristics at the county level may have a direct relationship with individual-level participation in crime. Second, the parameters representing the relationships between individual-level characteristics and participation in crime may vary by the county labor force characteristics. Table 5-2 showed that seven of the parameters measuring the influence of commitments and investments on participation in crime (three for the violent crime equation and four for the equation predicting property crime) do vary by county. Models 4A, 4B, 4C, 4D, 4E, 4F, and 4G in Table 5-5 indicate that some of this variance can be explained by county labor force characteristics.

Educational achievement has a significant negative relationship with participation in violent crime. The variance components from Model 1 indicate that this relationship varies significantly across the sample of counties. Model 4A demonstrates that an interaction term representing the product of industrial composition and the percentage of the population living in urban areas is a significant predictor of the slope representing the effect of educational achievement on violent crime. In more urban counties with high ratios of retail to manufacturing industry jobs the deterrent effect of educational achievement on crime becomes weaker. This finding supports the hypothesis predicting that poor labor force opportunities will decrease the negative relationship between investments in conforming lines of behavior and participation in crime. Continuing education may be perceived as a less worthy investment if it is less likely to be rewarded given the local opportunity structure.

In Model 1, the average relationship between being employed and participation in violent crime was not significantly different from zero. However, the variance component estimates show that this relationship varies significantly across the sample of counties. Model 4B treats the aggregate labor force characteristic variables as predictors of the variance in the slope. This model shows that industrial composition and the percentage of the labor force working part-time are both significant predictors of the variance structure. A high ratio of retail industry to manufacturing industry jobs strengthens the negative effect of being employed on violent crime. In other words, being employed is a stronger deterrent to violent crime in counties with weaker labor market opportunities. Having a job may serve as a more meaningful commitment when there are fewer high quality jobs available. If one were to lose their job by participating in crime they would be less likely to find quality employment in an economy dominated by retail sector jobs.

High rates of part-time employment decrease this same individual-level relationship. The rates of participation in violent crime among employed and unemployed respondents are more similar in counties with higher levels of part-time employment. As it was anticipated that percentage of part-time employment would be a similar indicator of labor force opportunity as industrial composition, it is unclear why these two indicators of labor market patterns have the opposite effect. As mentioned in the previous section, this may be due to collinearity between the interaction terms.

These findings further suggest that when all of the measures enlisted as indicators of weak labor force opportunities are included in the models, one or more of them may be representing different factors that contribute to different causal processes. The effects of part-time employment are consistent with the hypothesis. However, it is opposite the effects of the other aggregate indicators of labor force opportunity.

In Model 1, there was no significant relationship between individual-level part-time employment and involvement in violent or property crime. However, the estimate of the variance components indicated that when considering violent crime, the effect of part-time employment varies significantly across the sample of counties. Model 4C shows that both percent jobless and industrial composition are significant predictors of this variance. Part-time employment is more likely to increase individual-level violent crime in counties with higher levels of joblessness. Once the percent jobless is held constant, part-time employment will have a weaker positive relationship with violent crime in counties with higher ratios of retail to manufacturing industry jobs.

Model 1 indicates that the relationship between individual income and involvement in property crime is not significantly different from zero. The model also suggests significant variance in the parameter across the sample of counties. The equation predicting the structure of

this variance in model 4D demonstrates that the interaction terms representing urbanization and both the percentage jobless and the percentage of the workforce employed part-time are significant predictors of the slope representing the effect of income on property crime.

As the interaction of urban and part-time work increases, the negative relationship between income and property crime becomes weaker. Conversely, when the interaction term representing the percentage urban and the percentage jobless increases, the relationship between income and property crime becomes stronger. In urban areas when there are high levels of part-time employment, income has less of an effect on participation in property crime than when there are lower levels of part-time employment. In urban areas in which levels of joblessness are high, the deterrent effect of income on property crime becomes much greater than in areas with lower levels of joblessness. This may be explained by the overall accessibility of work. If an individual is making money legitimately in an area with high joblessness, their investment in their job may be higher. If they lose it, they may have difficulty finding another. However, in areas with high levels of part-time employment finding a new (while not very high quality) job may be fairly easy. For this reason a legitimate income may serve as less of a deterrent to crime.

Model 1 also indicated that the parameters representing the relationships between property crime and being employed, managing a household, and working part-time varied significantly across the sample of counties. Equations with different combinations of the aggregate-level labor force characteristics were computed, but none of them suggested that any of the aggregate labor force variables were significant predictors of the slopes representing these relationships.

Overall, these findings offer inconsistent support to ***H5*** which predicted that weak labor force opportunities will diminish the deterrent influence of investments and commitments on criminal behavior. Instead it appears that labor market characteristics have more varied and

unique effects on the individual parameters depending on which individual relationships are being examined and which indicators of labor force participation are included in the analysis. The negative effect of educational achievement on violent crime was weakened by a high ratio of retail to manufacturing jobs. The negative effect of employment on violent crime was weakened by high levels of part-time employment, and strengthened by a high ratio of retail to manufacturing jobs. Part-time employment appeared to encourage violent crime more in counties with high levels of joblessness. The negative influence of individual income on property crime was weakened by the interaction of high levels of urbanization and high levels of part-time work and strengthened by the interaction between urbanization and joblessness. These relationships all suggest that the value of individual investments that can deter crime is in part determined by the context in which they live and the opportunity structures to which they have access.

Discussion

The study of employment and crime is very well suited for approaches utilizing multi-level modeling. Previous research has drawn on both individual and macro-level explanations to support theoretical models for the empirically demonstrated relationships between rates of unemployment or certain types of employment and crime. Given the nature of aggregate data, and the difficulty in distinguishing between aggregated individual and true contextual effects, the theoretical models of contextual effects have often been evaluated more by their logic than through empirical examination. Using techniques that can disentangle the individual from the contextual effects and properly correct for the inefficient estimates and biased standard errors caused by correlated error structures and the violation of assumptions of independence, this analysis adds to our understanding of the role of labor market context in the employment and crime relationship.

The findings offer support to the claim that while controlling for individual-level background, education, and employment characteristics, contextual factors indicative of labor force opportunities can influence individual-level participation in criminal behavior. This influence is both direct when the county labor force characteristics influence the intercept of the individual-level equation predicting criminal behavior and indirect when the labor force characteristics influence the parameters of the individual-level relationships. The models of the direct effects indicate that labor force characteristics alone can significantly alter the individual-level intercepts across the sample of counties. When the labor force characteristics are interacted with the percentage of the county population that is living in an urban area, more of the product terms significantly influence the intercepts of the intra-county equations. The effects of labor force involvement vary depending on whether joblessness, part-time employment, or both are included in the equations.

The consistent positive effect on both violent and property crime of the interaction term representing the product of joblessness and urbanization indicates that in more urban areas, even after controlling for individual background characteristics, education, and employment, high rates of joblessness significantly increase individual participation in violent crime. There is little relationship between joblessness and property crime in urban areas, but a significant negative relationship in rural areas. Both of these effects may be caused by shifts in the spatial distribution of human activity. The negative relationship between county rates of joblessness and participation in property crime in rural areas may be the result of increased guardianship and decreased theft opportunities.

Higher levels of individual participation in violent crime in urban areas with high joblessness may be the result of having larger numbers of young adults free from normal employment schedules. It has been suggested in the literature that large concentrations of

unemployed individuals increase the size and frequency of gatherings of young adults in unregulated public spaces such as pool halls, street corners, bars, etc (Crutchfield 1989; Crutchfield and Pitchford 1997). Such gatherings can bring potential offenders into contact with accomplices, victims, and targets, creating numerous criminal opportunities. Given the spatial distribution of human activity, such situations may be both more likely, and more problematic in urban environments.

It is also likely that high rates of joblessness influence individuals' perceptions of local opportunity structures. If opportunities seem limited, illegal behavior may appear less risky to young adults even after holding constant their own employment experience. While both of these forces might be magnified if the individual respondent also has weak bonds to the labor market, this is not required for the county characteristics to be influential. Unfortunately, indicators of large public concentrations of young adults and perceptions of the labor market are not available in the data and cannot be included in the models. Thus while we can be confident that urban joblessness increases individual participation in violent crime above and beyond the employment of the individuals, competing theories of why cannot be evaluated.

Despite the uncertainty concerning the precise mechanism fueling the relationship, the present findings suggest that there are characteristics of places that directly influence individuals that are not necessarily mediated by these same characteristics at the individual level. These can be viewed as contextual effects. Sampson (1987) argued that the high levels of burglary in neighborhoods with single-adult households are the result of a lack of guardianship created by household composition, not that there is something about individuals or households in the neighborhoods that encourage burglary. I would argue that the relationship between some indicators of weak opportunity structures and crime at the county level are in part the result of marginalized individuals committing more crime (as found in Chapter 4). But, it is also the result

of the influence weak labor markets have on other aspects of the community. This influence can be seen beyond its effect on individual employment.

These findings offer strong support to both the labor stratification and crime perspective and the de-industrialization/underclass thesis. Both of these approaches suggest that crime and other social problems are the result of both individual labor market failure and localized concentrations of marginalized workers, in this case, the jobless. These concentrations influence both the motivation and the opportunity to participate in criminal behavior above and beyond the employment experiences of the individual. Support is also offered to the routine activities and crime perspective which suggests that crime can be both positively and negatively influenced by the spatial distribution of human activity.

The effects of the other aggregate-level interaction variables on participation in property crime are somewhat less consistent with the theoretical perspectives that have been discussed, yet add further support to the claim that context matters. In urban areas, holding constant the individual-level variables and rates of joblessness, the ratio of retail to service sector is negatively related to individual involvement in property crime. When the interaction between urbanization and joblessness is included in the model, the percent of the labor force that is employed part-time is also negatively related to participation in property crime. If these measures are indicators of weak labor force opportunities the mechanism's discussed above would expect their relationship to involvement in property crime to be positive. It may be that after controlling for joblessness, these variables are no longer useful indicators of weak opportunity structures. Instead they may be capturing some other aspect of local economies that serve to decrease the criminal involvement of individuals. This possibility is supported by the finding that without including the interaction term of joblessness and urbanization, the multiplicative effects of percentage part-time

and urbanization have a significant positive effect on property-crime. Exactly what is fueling this process is unclear.

Counties with high levels of retail industry jobs tend to have bimodal distributions of job quality. The entry-level retail jobs comprise the lower quality jobs and high skilled and professional service industry jobs comprise the higher quality jobs. It may be the case that once joblessness is held constant the indicators of part time employment and industrial composition are capturing some of the effects of the upper end of the labor force. These effects may act to decrease crime rates once joblessness is held constant. It is also possible that by including all of the interactions in the model, significant collinearity is introduced.

These unanticipated findings suggest the need for more theoretical and empirical examination of how labor market opportunity is conceptualized. The results demonstrate that these indicators of economic and labor market well being are an important part of understanding how aggregate labor force characteristics influence criminal behavior. Given their importance, these characteristics and their relationships to involvement in violent and property crime deserve additional attention.

The influence of the aggregate-level interaction variables on the intra-county intercepts also demonstrates the importance of place in models of work and crime. The influence that some of the aggregate labor force variables have on the individual-level parameters representing the relationships between the investments and commitments individuals develop and their participation in crime further suggests the importance of context. Using multi-level models to examine the effect of context on individual-level relationships has not been used before in the area of work and crime. Other than Crutchfield and Pitchford's work (1997) which used a product term to explore the interaction between individual employment and county labor force

composition, research has explicitly or implicitly assumed that relationships identified at the individual level would be stable across different contexts.

The present findings demonstrate that much of the time this assumption may be correct, but not always. None of the relationships between criminal involvement and the three employment quality variables, which were some of the strongest predictors of crime in Chapter 4, vary significantly by context. The deterrent effects of rewarding job attributes, benefits, and enjoyable working conditions appear to be independent of the larger economic and labor market conditions in which individual respondents live. This was a surprise. As these variables were significant predictors of both violent and property crime in Chapter 4, I expected them to play an important role in the multi-level analysis. This may be the result of limited variance in the job quality measures or be due to a truncated selection of counties. The effects on crime of variables related to educational achievement, employment status, working part-time, individual income, and managing a household are not constant across the sample of counties. The relationships vary significantly, and in the case of educational achievement, being employed, and individual income, a significant amount of this cross-context variance can be traced to local labor force opportunities.

The effects of the aggregate variables on the individual parameters are varied. The hypothesis concerning these effects proposed that indicators of weak labor force opportunities would decrease the deterrent influence of respondents' positive labor market experiences or increase the negative effects of poor labor market experiences. The effect of a good job in keeping someone from participating in crime would not be as strong in counties with weak labor market opportunities. This was partially supported in all of the models in which any of the labor force characteristics were significant predictors of the slopes. The negative influence of educational achievement on violent crime was decreased in counties with high ratios of retail to

manufacturing industry employment. While this issue has not been explored in previous quantitative work, in his ethnographic study of employment and crime in New York City, Sullivan (1987) pointed to a process in which a high school diploma was a needed requirement for union membership in manufacturing trades. Such credentials are less likely to serve as pre-requisites for entry-level positions in retail industries. If staying in school is less likely to facilitate access to quality employment, then it will serve as less of a deterrent to criminal behavior. School will only act as an investment if individuals perceive a future return.

The percentage of the labor market working part-time weakened the negative relationship between employment and violent crime across the whole sample, and weakened the negative relationship between income and property crime in more urban areas. Respondents who are employed are less involved in violent crime and respondents with larger incomes are less involved in property crime. However these relationships break down in counties with high levels of part-time employment. For the income and property crime relationship, this breakdown is more prevalent in urban areas. The rate of joblessness also influences the relationship between part-time employment and violent crime. Respondents working part-time are more likely to commit more violent crime that respondents who are employed full-time in counties with high rates of joblessness. These findings support the fifth hypothesis (***H5***) and could be explained by the perceptions of weak labor force opportunities that high levels of part-time employment may engender and the concentrations of marginally employed individuals that increase criminal opportunities.

However other variables that were proposed to measure similar causal processes demonstrated less consistent effects. Industrial composition in the case of both the employment/violent crime relationship and the part-time employment/violent crime relationship demonstrated an unexpected influence. In counties dominated by retail industry employment,

both having a job and working part-time is a stronger deterrent to violent crime. The percent jobless in the case of the income/property crime relationship strengthens the individual-level negative relationships. In counties with high rates of joblessness, income has a more significant negative effect on property crime. As mentioned above in discussing the direct effects of the aggregate characteristics, these disparate findings may be caused by other causal processes that are being tapped by the indicators of county labor force characteristics. They all suggest that county labor force characteristics matter, but their influence is not as straight forward as originally predicted.

Conclusion

Using multi-level modeling techniques to examine the aggregate and individual effects of employment on crime demonstrates the multifaceted influence of work. Both patterns of labor force involvement at the aggregate level, and individual work experiences at the individual level influence the degree to which respondents participated in violent and property crime. Previous research that has explained aggregate-level findings with individual-level causal processes may have been missing an important aspect of the employment and crime relationship. In more urban areas, county-level joblessness increases participation in violent crime and in rural areas county-level joblessness decreases property crime. These effects occur among both the employed and the unemployed. When holding joblessness constant, county-level industrial composition and part-time employment decreased individual property crime. Without including joblessness in the models high levels of part-time employment appeared to have the opposite effect. It increased property crime. Again, all of these effects were demonstrated holding constant the employment experiences of the respondents.

These findings suggest both that labor market context matters and must be considered above and beyond its function of relegating some individuals to bad jobs or unemployment, and that more attention is needed in the development of indicators of labor market opportunity. The findings also suggest that once joblessness is held constant, industrial composition and part-time employment may be tapping into some other process beyond the concept of opportunity structures.

In addition to the direct effects, county labor market characteristics influence the individual-level relationships between certain investments in work and school and participation in crime. Other investments, which were shown to significantly deter crime, did not vary across the sample of counties. Others varied, but their variance could not be explained by the county patterns of labor force involvement.

As well as addressing issues around the causal mechanism in aggregate studies of employment and crime, this analysis suggests that individual-level models that do not take area characteristics into account may be mis-specified. Unless the contextual causal mechanism can be conceptualized and measured at the individual level, then important variables may be left out of the individual models. The explanations given for the contextual effects, related to congregations of young adults and perceptions of opportunity, could be measured at the individual level. However, it is difficult to find data sets with all of the variables one needs.

The findings presented here provide an empirical link between macro and micro-level processes. Macro-economic factors such as industrial composition influence individuals both by affecting individual employment outcomes and by creating a context that is influential in its own right. Further research is needed to better identify the causal mechanisms behind these relationships.

Table 5-1
Variable Means and Standard Deviations for Respondents and Counties Included and Excluded from HLM Models

	Group 1 In HLM Model N=4742		Group 2 Respondents in Counties Not Included in HLM Model N=1144		Group 1 vs. Group 2	Group 3 Respondents in Military not Included in HLM Models N=1215		Group 1 vs. Group 3
	Mean	S.D.	Mean	S.D.		Mean	S.D.	
Background Measures								
Age	19.546	1.233	19.655	1.236	**	20.137	1.131	***
Male	.466	.499	.488	.500		.652	.476	***
Black	.263	.440	.168	.375	***	.200	.400	***
Hispanic	.160	.367	.161	.368		.063	.244	***
Commitments								
Married	.163	.369	.177	.382		.250	.433	***
Educ Achievement	1.864	.752	2.055	.767	***	1.998	.418	***
Enrolled College	.237	.425	.387	.487	***	.072	.259	***
Enrolled HS	.128	.334	.064	.245	***	.003	.057	***
Own Household	.355	.479	.334	.472		.351	.478	
Income								
Individual Income	.422	.539	.413	.512		.818	.378	***
Previous Delinquency								
School Trouble	.254	.424	.221	.404	*	.276	.431	
Employment Status								
Employed	.599	.490	.548	.498	**	.000	.000	***
Student	.128	.334	.218	.413	***	.000	.000	***
Managing Household	.007	.251	.056	.230		.000	.000	***
Employment Involvement								
Working Part-time	.269	.444	.256	.437		.000	.000	***

Continued on next page

Table 5-1 – Continued

Variable Means and Standard Deviations for Respondents and Counties Included and Excluded from HLM Models

Employment Characteristics								
Rewarding Attributes	.004	.780	.052	.760		-.135	.921	***
Benefits	-.000	.723	-.028	.698		1.010	.000	***
Poor Conditions	-.001	.752	-.037	.725		.440	1.101	***
Dependent Variables								
Violent Crime	.895	1.466	.825	1.366		1.217	1.708	***
Property Crime	1.025	2.029	1.070	2.072		1.199	2.228	*
	N=158		**N=396**			**N=0**		
County Characteristics								
Industrial Comp	.967	.732	1.064	1.084		-----	----	
% Jobless	.438	.062	.441	.068		-----	----	
% Part-time	.369	.039	.392	.071	***	-----	----	
Disorganization	-.097	1.035	-.137	.947	*	-----	----	
Segregation	.590	.159	.531	.164		-----	----	
% Urban	.587	.406	.351	.385	***	-----	----	
Interaction Terms								
% Urban * Industrial Comp	.553	.510	.376	.595		-----	----	
% Urban * % Jobless	.248	.173	.146	.173		-----	----	
% Urban * % Part-time	.212	.146	.132	.148		-----	----	

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

Table 5-2
Random Coefficients Models of Criminal Involvement Variables Regressed on Background Measures, Commitments, Income, Previous Delinquency, and Employment Characteristics

	Violent Crime N=6460		Property Crime N=6372	
Background Measures	***Coef***	***S.E.***	***Coef***	***S.E.***
Age	-.061**	.022	-.100***	.025
Male	.617***	.040	.655***	.064
Black	.030	.054	-.252***	.075
Hispanic	-.177**	.061	-.276***	.074
Commitments				
Married	-.080***	.060	-.278***	.069
Educational Achievement	-.153***	.456	-.043	.058
Currently Enrolled College	-.205***	.058	-.239**	.077
Currently Enrolled HS	-.288***	.087	-.313**	.099
Living in Own Household	-.036	.051	.016	.067
Income				
Individual Income	-.009	.047	-.082	.074
Previous Delinquency				
School Trouble	.673***	.060	.711***	.090
Employment Status				
Employed	-.128	.113	-.060	.191
Student	.001	.070	-.094	.113
Managing Household	-.179*	.086	-.327***	.100
Employment Involvement				
Part-time	-.008	.072	-.024	.100
Employment Characteristics				
Employment Quality	.014	.026	-.073*	.034
Benefits	-.092**	.031	-.120**	.043
Poor Conditions	.090**	.031	.089*	.043
Intercept	2.190***	.413	2.945***	.474

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

Table 5-3
Variance Components for Individual-Level Average Effects Models

	Violent Crime			Property Crime		
Background Measures	***Variance Component***	***Chi-Square***	***P-Value***	***Variance Component***	***Chi-Square***	***P-Value***
Age	.021	28.642	.279	.007	29.127	.258
Male	.023	31.540	.353	.137***	59.269	.000
Black	.061	31.381	.177	.116	28.428	.288
Hispanic	.094	34.071	.106	.112	35.065	.087
Commitments						
Married	.052	28.600	.281	.322	22.540	>.500
Educational Achievement	.093*	37.459	.049	.112	34.342	.101
Currently Enrolled College	.050	11.926	>.500	.091	34.323	.101
Currently Enrolled HS	.323	36.560	.063	.082	31.699	.167
Living in Own Household	.066	28.352	.291	.073	30.332	.212
Income						
Individual Income	.032	34.167	.104	.195***	64.488	.000
Previous Delinquency						
School Trouble	.161***	56.726	.000	.493***	51.939	.001
Employment Status						
Employed	.319***	57.836	.000	1.774***	56.190	.001
Student	.066	37.176	.055	.290	35.332	.081
Managing Household	.085	36.983	.058	.195**	51.477	.002
Employment Involvement						
Part-time Employment	.212**	47.549	.003	.347**	47.552	.003
Employment Characteristics						
Employment Quality	.014	21.448	>.500	.028	18.614	>.500
Benefits	.028	15.553	>.500	.049	32.546	.143
Poor Conditions	.032	29.182	.256	.067	36.253	.068
Intercept	2.443	28.643	.279	1.693	31.259	.180

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

Table 5-4

Multi-Level Models of Criminal Involvement Variables on Individual and County Characteristics ^

Violent Crime
N=6460

	Model 2		Model 3		Model 4		Model 5		Model 6	
	Coef	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*
Indust Composition	.010	.478	.017	.028	.020	.031	.010	.030	.024	.027
% Jobless	.083	.415	.053	.027	.044	.047	.023	.442	-1.092*	.557
% Part-time	-.010	.652	-.036	.649	-.016	.641	-.024	.463	1.022	.623
Disorganization	.005	.021	.009	.023	.008	.024	.011	.024	.014	.023
Segregation	.120	.115	.142	.126	.120	.167	.177	.160	.126	.163
% Urban * Indust Comp			-.026	.041	-.035	.048	-.009	.049	-.024	.048
% Urban * % Jobless					.048	.231			1.764*	.846
% Urban * % Part-time							-.100	.267	-2.187*	.977
Intercept	2.072	.478	2.086	.479	2.087	.479	2.092	.478	2.223	.484

Property Crime
N=6372

	Model 2		Model 3		Model 4		Model 5		Model 6	
	Coef	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*	*Coef*	*S.E.*
Industl Composition	.034	.038	.030	.040	.111	.046	.088	.047	.121**	.044
% Jobless	-1.944**	.595	-1.928**	.602	-2.288***	.573	1.719**	.590	-3.909***	.697
% Part-time	1.024	.941	1.043	.941	1.494	.910	.946	.934	2.953***	.868
Disorganization	.037	.032	.035	.035	.015	.035	.019	.036	.022	.035
Segregation	.294	.178	.279	.188	-.152	.209	-.041	.216	-.160	.201
% Urban * Industl Com			.014	.063	-.195**	.078	-.145	.076	-.179*	.078
% Urban * % Jobless					1.005***	.294			3.551**	1.127
% Urban * % Part-time							.948**	.352	-3.228**	1.332
Intercept	3.296	.616	3.289	.613	.347	.593	3.271	.602	3.558	.601

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

^ Models 2-6 include all individual level variables shown in Model 1. They have been removed from the table in order to fit these tables on one page. The individual level coefficients do not vary significantly across the models.

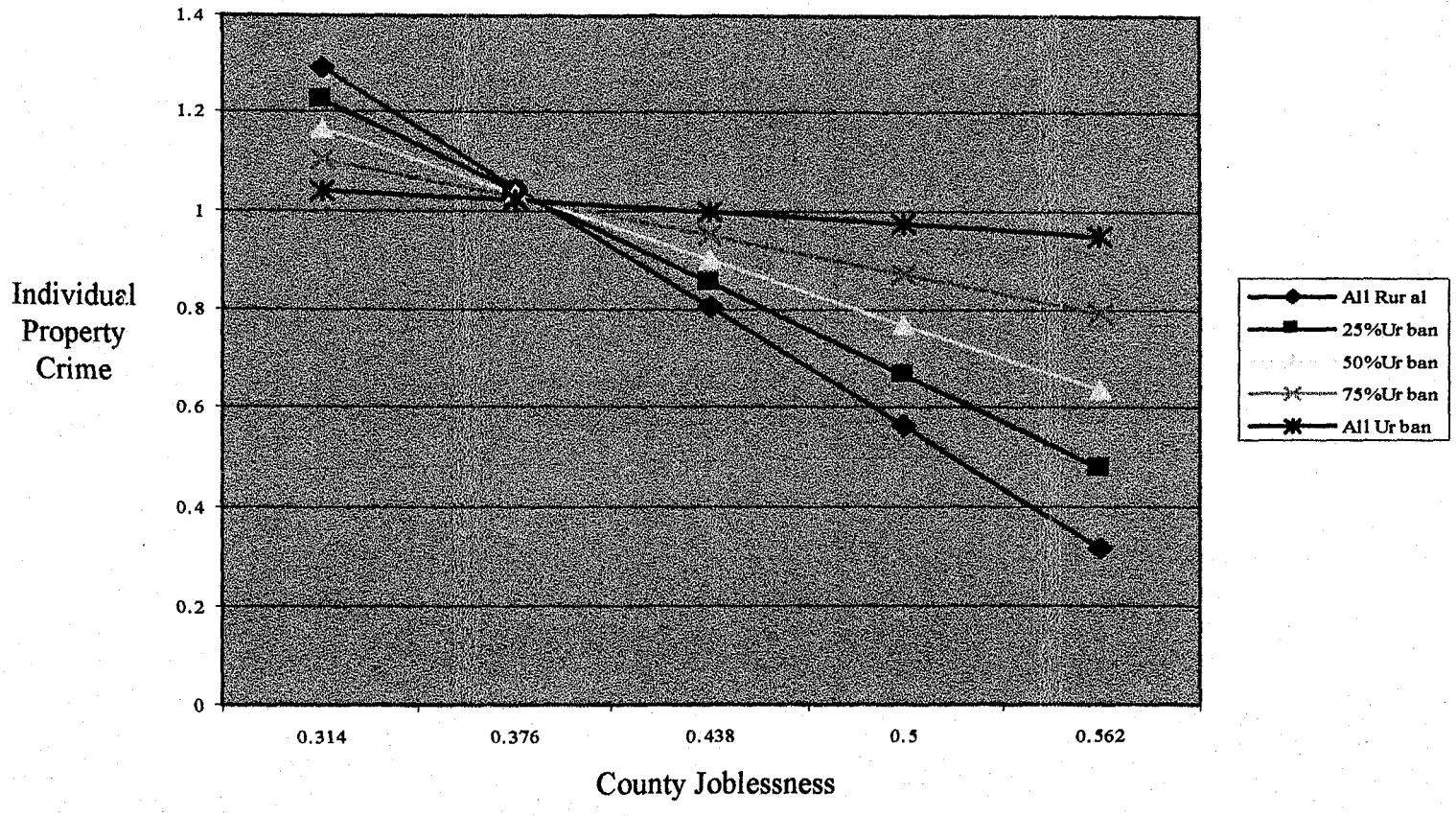

Figure 5-1 Joblessness, Urbanization and Individual Property Crime

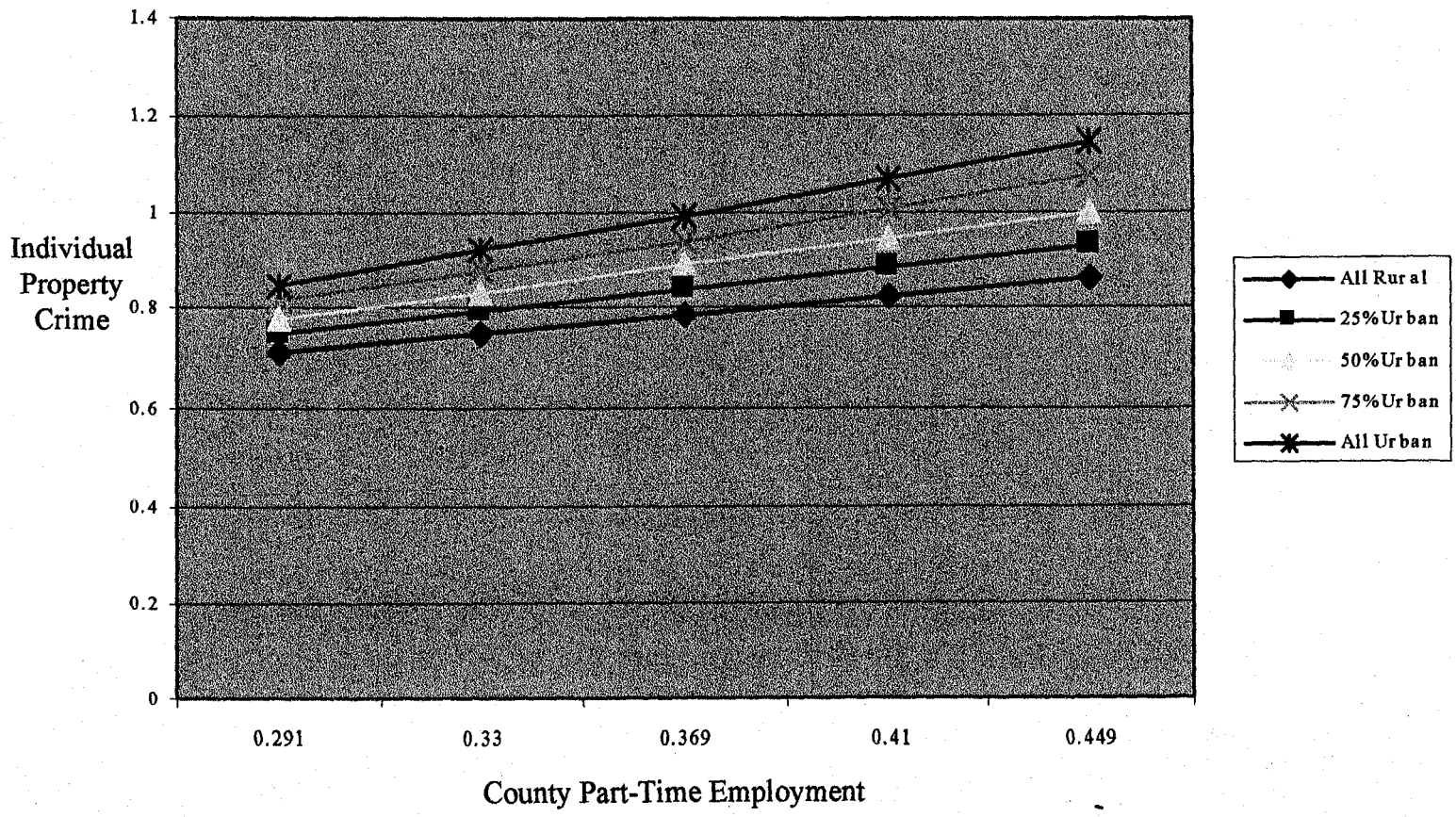

Figure 5-2 Part-Time Employment, Urbanization, and Individual Property Crime

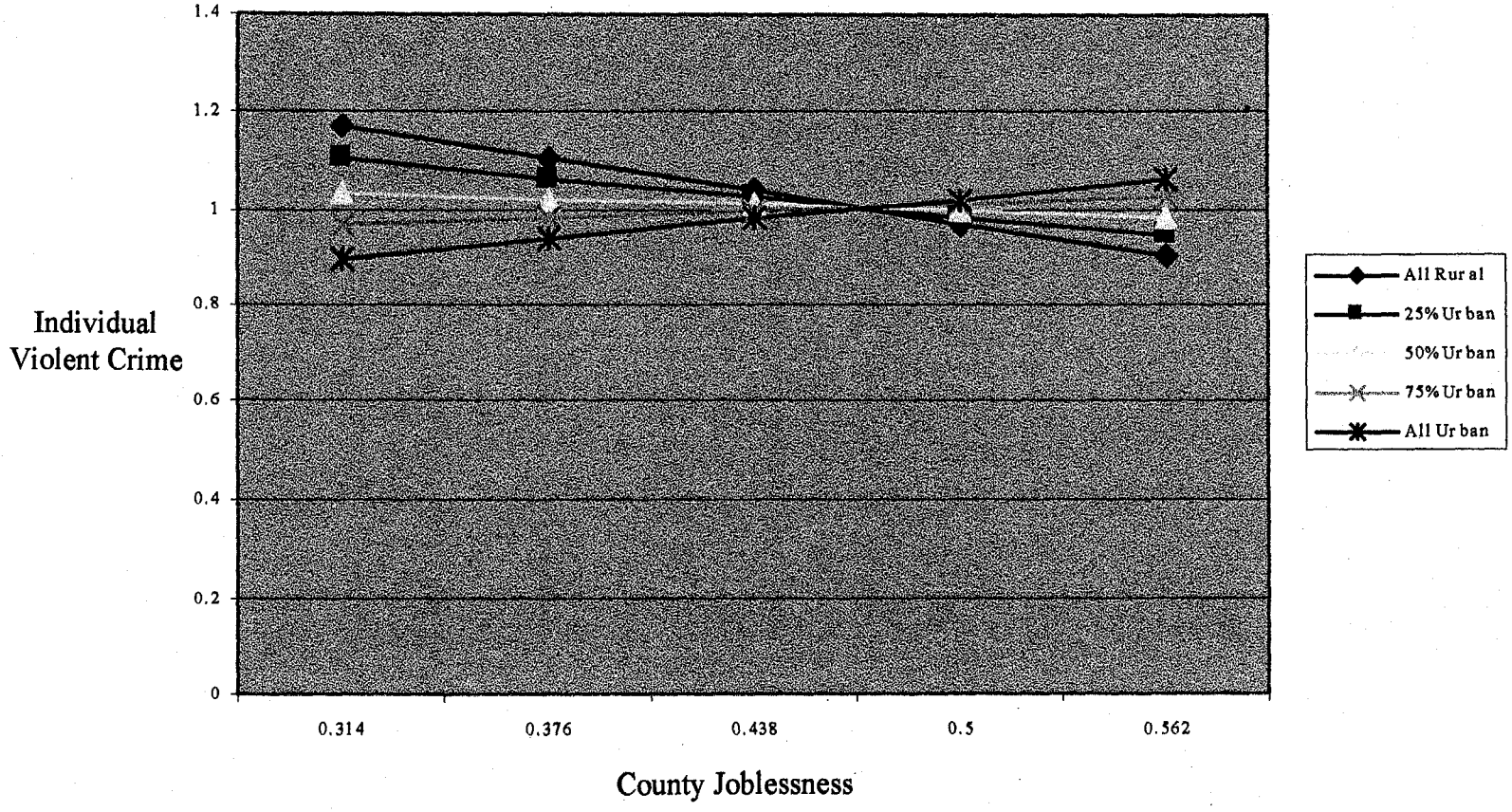

Figure 5-3 Joblessness, Urbanization, and Individual Violent Crime

Table 5-5

Using County Characteristics to Explain Across-County Parameter Variance for Relationships Between Investments in Employment and Education and Criminal Behavior

Parameters with Significant Variance Components	*Contextual Variables*	*Coef*	*S.E.*
Model 4A			
Education >>> Violent Crime		-.228**	.072
	Indust Comp	-.051	.053
	Indust Comp * % Urban	.215*	.086
Model 4B			
Employment >>> Violent Crime		-1.064**	.406
	Indust Comp	-.116*	.048
	% Jobless	-.183	.704
	% Part-time	3.056**	1.119
Model C			
Part-time >>> Violent Crime		-1.233**	.386
	Indust Comp	-.234***	.057
	% Jobless	3.018***	.844
	% Jobless * Urban	.538	.327
Model 4D			
Income >>> Property Crime		-.899	.545
	Indust Comp	-.077	.071
	% Jobless	1.616	1.130
	% Part-time	.130	1.676
	Indust Comp * % Urban	-.013	.187
	% Jobless * Urban	-3.987*	2.039
	% Part-time * Urban	5.453*	2.465
Model 4E			
Employment >>> Property Crime			
	No Significant Effects		
Model 4F			
Mng House >>> Property Crime			
	No Significant Effects		
Model G			
Part-time >>> Property Crime			
	No Significant Effects		

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

Chapter 6: The Conclusion

As part of the 1999-2000 National Institute of Justice Lecture Series, noted economist Richard Freeman addressed the question of whether the booming economy of the 1990's could partially explain the falling crime rates during the same period. In discussing the evidence, he pointed to the lower levels of unemployment and the increase in wages for low skilled jobs. His primary focus was on the relative monetary incentives and disincentives of employment, crime, and punishment. While noting that there were other important issues that should be included in a discussion about the decrease in crime, he claimed that economic factors were an important part of the puzzle.

This dissertation uses data on employment and crime from over two decades ago. The late 1970's and early 1980's offered a very different economic landscape then the turn of the century, and levels of crime were substantially higher. Despite these differences, the findings from this research suggest a process that is similar, yet much more inclusive than that suggested by Freeman. They suggest that at both the community and individual-level, employment matters. Both industrial composition and labor force participation at the county level have direct and indirect effects on violent and property crime rates. These effects cannot be explained entirely by the fact that individuals who are unemployed commit more crimes. There is a contextual influence of weak labor market opportunity that operates above and beyond influencing individual employment experiences. Individual experiences also matter. Individuals who are employed, those working in higher quality jobs, and those in school commit fewer crimes than individuals who are unemployed, not in school, and working in lower quality jobs.

Conceptualizing Employment and Its Relationship to Crime

Like much of the research in the area, Freeman's conceptualization of work is strictly economic. Employment is thought to deter crime by increasing the monetary benefits of working and the monetary costs of crime (the "opportunity costs" if criminal behavior is detected and sanctioned). Given this conceptualization, the types of criminal behavior we would expect employment to be more useful in explaining would be income generating crime.[1]

In focusing on the individual-level causal process relating employment to crime this dissertation suggests that the conception of "opportunity costs" must be broadened to include other physical and psychic rewards that stem from employment. The analysis suggests that these rewards are more influential than the income work generates. I argue that these physical and psychic characteristics of jobs act to encourage the development of a sense of investment that has the power to discourage criminal behavior. Education, also an investment in a conventional line of action has a similar effect.

Not restricted to economic factors, the proposed causal mechanism suggests that unemployment and poor quality employment can influence both financially motivated and more expressive types of criminal behavior. The theory from which this mechanism stems, social control theory, suggests that the motivation for committing crime is not what deserves our attention. Crime is just a natural extension of our self-serving interests (Hirschi 1969). It is what keeps most people from participating in crime that is the real question. Investment in conventional lines of activity is one of the answers. Sampson and Laub (1990) discuss this as the "salience of adult social bonds." These bonds, which can be developed in a number of arenas

[1] The costs of crime as they relate to lost wages as a result of imprisonment could be considered for any type of crime. However, economic models tend to focus on the profits from crime as well.

including work, family, public life, etc., create opportunity costs that are considered when weighing the pros and cons of criminal behavior.

There is no reason to expect these investments to have disparate effects on violent and property crime. Much of the past research has focused on income generating crime (Grogger 1997; Chiricos 1987), yet there is solid evidence that violent crime is related to employment factors as well (Crutchfield and Pitchford 1997; Crutchfield, Glusker, and Bridges 1999). The current research suggests that at the individual level whether an individual is employed or not has more of an effect on violent crime, and that the effects of employment characteristics representing job quality are similar across violent and property related criminal behavior. I suggested that the stronger influence of employment status on violent verses property crime may be caused by other factors related to criminal opportunities rather than employment serving as a deterrent to violent crime, but not to property crime.

In Chapter 1, I questioned whether job characteristics, all indicators of employment quality, would have similar or unique effects on crime. The analysis in Chapter 4 demonstrated that empirically the indicators were quite distinct and they each exerted independent influence. Yet, their effects on crime were similar. Controlling for an array of important characteristics including previous misbehavior, education, and income, individuals with higher quality jobs commit fewer violent and property crimes.[2] I would argue that, while the characteristics were distinct, any beneficial aspect of employment encourages a sense of investment in the labor force, thus reducing involvement in crime. This finding supports an additive model in which the more positive job characteristics there are, the more investment is developed, and the more one is deterred from crime. One area for future research is to further examine whether some job characteristics serve as more effective deterrents to crime than other characteristics.

It is important to note that the effect of both employment status and employment characteristics were, in most cases, better predictors of crime than individual income. The fact that non-monetary job characteristics are more influential in predictive models of both violent and property crime again suggests the need for a re-conceptualization of the relationship between employment and crime. Economists, policy makers, and the general public have often interpreted the work and crime relationship from the perspective of crime as a substitution for legitimate income. While some criminals may be stealing in order to put bread on the table, this is likely not the case for most. Labor market failure is probably not a motivational force to participate in crime for the vast majority of offenders. Instead, failure in the labor market removes a potentially important deterrent influence leaving individuals freer to deviate, whether it is for profit or not.

In thinking about the conceptualization of employment at the aggregate level, the findings suggest that treating joblessness, part-time employment, social organization and many other area characteristics as exogenous variables limits our understanding of the process by which macro-economic factors lead to crime. Identifying variables that influence labor market patterns creates a longer chain of events and adds to our knowledge of the causal mechanisms that drive the relationship. Industrial composition, here measured as the ratio of retail to manufacturing industry jobs, precedes patterns of labor force involvement. It has a direct effect on property crime, independent of employment patterns, and an indirect effect on both property and violent crime mediated by joblessness, part-time employment, community instability, and residential segregation.

The direct effects of the ratio of retail to manufacturing industry jobs on aggregate rates of property crime (after controlling for the mediating variables) suggest that the influence of industrial composition is not limited solely to joblessness, part-time employment, community

[2] These findings were statistically significant except the effects of rewarding job attributes on violent crime.

stability, and residential segregation. There are either other aspects of labor force participation not measured here that influence crime, or there is some other process stemming from industrial composition, independent of labor market characteristics, that encourages property crime. Dual and segmented labor market theory would suggest that individuals who are working in counties dominated by retail industry employment tend to have lower quality jobs than those working in counties with higher concentrations of manufacturing industry jobs. If this is the case then job quality, which cannot be directly measured in the aggregate analysis, may be causing the effect of industrial composition on property crime after joblessness and part-time employment are held constant.

It is also possible that some unobserved characteristic of counties that is influenced by industrial composition has a positive effect on property crime. This characteristic could be related to the motivations for committing property crime, such as economic inequality, or the opportunity to commit property crime, such as the availability of targets. Counties with heavy concentrations of retail industry may provide a larger number of commercial targets for property theft. Either way, broadening our conception of employment at the aggregate level encourages us to look beyond measures of unemployment to understand the relationship between work and crime.

Level of Analysis

The majority of the research in the field of employment and crime is at the aggregate level. This approach is fine for establishing trends, but it can tell us little about the causal mechanism or the level on which this process is playing out. Are the aggregate relationships just the result of summing up the individual experiences and adding a certain amount of error or bias in the process? Does an increase in employment decrease crime simply because those who would be committing crime are now gainfully employed? Or, is the whole more than the sum of its

parts? Is there something about a community with high levels of joblessness that increases criminal involvement among both the employed and the unemployed individuals?

This dissertation examines the relationship between employment and crime at both the aggregate and individual level, first separately, and then simultaneously. The aggregate analysis showed that at the county level the ratio of retail to manufacturing industry jobs, rates of joblessness, and part-time employment all influenced rates of violent and property crime. Counties with higher rates of joblessness had significantly higher rates of violent crime and significantly lower rates of property crime. Counties with high levels of part-time employment exhibited significantly lower rates of violent crime and higher rates of property crime. However, when the labor force participation variables were interacted with urbanization, the influence of labor force involvement on crime changed. The positive influence of joblessness on violent crime appears to be especially strong in urban areas and the inverse relationship between joblessness and property crime is stronger in rural counties. The percentage of the labor force that is working part-time increases property crime more in urban areas and decreases violent crime more in rural areas.

Adding to the Aggregate Literature

These findings offer mixed support to a growing body of literature that has identified significant positive relationships between unemployment and crime. Over a decade ago, Chiricos (1987) claimed that the "consensus of doubt" that had developed concerning the relationship between unemployment and crime was misguided. He suggested that unemployment did, in fact, increase crime, and that this relationship was most likely to appear when examining property crime amongst smaller geographic aggregations. The current work does not support his

conclusion. There was no relationship between joblessness and property crime in urban areas, and there was a significant negative relationship between the two in rural areas.

However, there is support for an aggregate-level relationship between joblessness and violent crime in urban areas. There does not appear to be a relationship between joblessness and violent crime in counties with smaller proportions of the population living in urban areas. These findings support much of the current work that has focused on weak labor force participation and violent crime in metropolitan areas (Wilson 1989, 1996; Crutchfield 1989; Crutchfield and Pitchford 1997).

The urban/rural distinction offers important insights into the causal mechanisms that generate relationships between work and crime at the aggregate level. I suggested in Chapter 3 that the differences in the relationships between labor market participation and crime across counties with various levels of urbanization may be due less to variations in the influence of labor force opportunity structures and more to the availability of criminal opportunities. In rural areas, the targets of property crime are more likely to be goods owned by individuals (cars, houses, etc.), while in urban areas targets may be geared more towards commercial establishments. In areas with higher rates of joblessness fewer residences are left unoccupied during work hours. This may decrease the overall property crime rate in rural areas, while having less of an effect in urban areas given that commercial targets are not as influenced by this type of guardianship. It is also likely that for guardianship to decrease crime neighborhood networks and the sense of community must be relatively strong. This is more likely to be the case in rural than urban areas.[3]

[3] In addition to the role of guardianship the role of criminal role models and organized criminal structures may also be a part of the urban/rural distinction. Cloward and Ohlin argued that in order for criminal subcultures to thrive, certain structures related to illegal opportunities must be in place (Cloward and Ohlin (1960). For example, for car theft or burglary to be profitable, there must be a mechanism for selling the cars or household goods. These structures are more likely to be in place in urban than in rural areas.

In urban areas, concentrated joblessness is likely to facilitate a process through which opportunities to engage in violent crime become abundant. Large congregations of young individuals with weak ties to the labor market create a situation in which victims and accomplices to violent crime are easily available. Weak institutional opportunities may also give rise to oppositional frameworks in which violence is used to establish a sense of achievement not available through labor market participation and success.

Levels and Mechanisms

What the aggregate findings could not tell us was whether the relationships between industrial composition, joblessness, and unemployment could be explained by individual-level causal mechanisms, or whether some type of area, or contextual effect was driving the observed relationships. The ecological fallacy reminds us that just because rates of joblessness increase crime rates, this does not necessarily mean that those who have no job are more likely to commit crime. The individual-level analysis in Chapter 4 addressed the question of whether these relationships demonstrated at the aggregate level also exist at the individual level.

With respect to the aggregate analysis, the findings in Chapter 4 suggest that at least part of the county-level relationship between joblessness and crime can be explained at the individual level. The individual-level analysis suggests that urban counties with high rates of joblessness may have higher rates of violent crime because individuals who do not have jobs are more likely to participate in violent crime. Across the sample of counties there was a negative relationship between joblessness and property crime. This was especially true in more rural counties. As joblessness increased, property crime decreased. Not surprisingly this relationship did not exist at the individual level. Individuals without jobs were not less likely to participate in property crime.

It may be, as suggested earlier, that the aggregate-level finding is caused by a contextual-level mechanism related to opportunities to commit property crime.

To further explore the relationship between the individual and aggregate-level analyses I examined the effects on individual property crime of whether or not the respondent in the individual analysis lived in an urban area. I looked at the main effects of these variables in the models and the interactions between the urban variables and employment status. None of the coefficients representing these effects were statistically significant. Again, this suggests that the effect at the aggregate level may be due to processes that cannot be explained through individual employment status.

At the county level, part-time employment also influenced rates of violent and property crime. At the individual level there was no relationship between working part-time and participating in crime. This means that there is something about part-time employment at the county level that influences crime that is not based on an individual-level causal mechanism.

Contrasting the aggregate and individual-level analysis shows that some of the aggregate-level findings can be explained, at least in part, by causal mechanisms related to individual levels of investment in conventional lines of activity. However, it also suggests that there are other aspects of the aggregate relationship that are not easily explained by causal mechanisms at the individual level. These may instead be due to contextual effects driven by county characteristics that are independent of the labor force experiences of the individuals. This leads to the third part of my dissertation, the multi-level analyses.

In Chapter 5 I use multi-level modeling techniques to examine the influence of individual and county level effects at the same time. The findings suggest that both county and individual characteristics significantly influence individual-level criminal behavior. In addition to the individual-level characteristics related to employment status, employment quality, education, and

important background characteristics, the counties in which respondents live significantly influence their involvement in crime. Independent of their own experiences and characteristics, individuals living in counties with high levels of joblessness and urbanization committed more violent crime than those living in more rural counties with lower levels of joblessness. This finding is consistent with the hypotheses stemming from the idea of concentration effects. Both individuals who are not working, and those who are working are more likely to commit violent crimes if they are living amidst concentrations of jobless individuals. Such concentrations are apt to decrease informal deterrents by having a negative influence on the perceptions of legitimate opportunity and increase criminal opportunity by facilitating the coming together of motivated offenders with accomplices, targets, and victims.

Respondents living in more rural areas with high joblessness were less likely to participate in property crime than those living in areas with lower levels of joblessness. For those living in more urban areas, rates of joblessness had no significant effect on their participation in property crime. I proposed that the guardianship that can result form increased joblessness would play a larger role in rural than urban rates of property crime.

Without holding joblessness constant, respondents living in urban counties with high levels of part-time employment were more involved in property crime than individuals living in counties with lower levels of part-time employment. However, when joblessness is included in the equation counties with high levels of both part-time employment and retail employment had lower rates of property crime. These findings are less consistent with the theoretical perspective that has been suggested throughout the dissertation. It may be the case that once joblessness is controlled, industrial composition and part-time employment are no longer indicators of counties with weak labor force involvement. Instead, these characteristics of labor force patterns may

generate other casual mechanisms related to criminal opportunities, or other processes unrelated to labor force participation.

The multi-level models also allow us to examine which coefficients vary across counties and whether this variance can be explained by county-level characteristics. Of the coefficients related to investments that individuals make in conventional lines of activity, the effects of educational achievement, employment status, and part-time employment on violent crime, and the effects of income, employment status, part-time employment, and managing a household on property crime all varied significantly across the sample of counties. The across county variance in the relationships between education, employment, part-time employment and violent crime, and income and property crime could be partially explained by variables representing the industrial composition, and patterns of labor force involvement in the counties. With some exceptions the county indicators of weak labor force opportunity weakened the deterrent effects of the individual investments that respondents made in conventional lines of activity. If people perceive that investments will not pay off, they will not be as concerned about losing them.

These findings can be thought of as the indirect effects that contextual variables have on individual variables, or as "slopes as outcomes." County characteristics not only change the mean level of individual offending for respondents in the county, they influence the degree that individual-level characteristics affect participation in violent and property crime. Along with the direct effects, these findings suggest the importance of including contextual characteristics in analyses of the relationship between work and crime.

Shedding Light on Theories of Employment and Crime

In Chapter 1 I suggested that one approach to deepening our understanding of the relationship between employment and crime was to address a set of questions framed by the labor

market stratification and crime perspective. In doing so I have examined competing conceptualizations of the causal mechanism driving the employment and crime relationship, assessed the empirical evidence for the relationship between employment and crime at the aggregate and individual level, explored the role of employment quality in individual models of work and crime, examined the degree to which contextual characteristics directly affect individual-level crime, and demonstrated that some of the individual-level relationships vary across different labor market contexts. Collectively, the findings resulting from these inquiries offer strong support to both the labor market stratification perspective and the theoretical frameworks from which the perspective draws.

The labor market stratification and crime perspective suggests two processes by which labor market segmentation will lead to criminal behavior. The first step for both of these processes is the development of local labor markets comprised primarily of secondary sector, or low quality jobs. The first process by which this development leads to crime is that individuals who end up unemployed, underemployed, or employed in low quality, unstable, dead end jobs that tend to be both financially and psychically unrewarding will not feel invested in their employment. If opportunities for crime arise, the opportunity costs that these individuals may consider are substantially lower than the potential costs of crime for individuals who are employed in stable and rewarding jobs. Theoretically, this explanation borrows heavily from social control theory (Hirschi 1969) in relating investments in conformity to informal deterrence.

Second, individuals who are living in areas with high rates of marginalized employment (combination of joblessness and low quality jobs) are more likely to participate in crime (especially violent crime) due to an increase in criminal opportunities caused by larger concentrations of individuals with few or no investments in conventional activities. These concentrations are especially problematic in urban areas where they are more likely to encourage

gatherings in public spaces such as taverns, street corners, and arcades. Concentrations of marginally employed individuals are also apt to affect people's perceptions of local labor market opportunities. These perceptions may further influence their sense of investment in conventional lines of activity.

The current work offers strong support to both the individual and contextual effects suggested by this perspective. Employed individuals committed fewer violent crimes, and those with employment characteristics promoting a sense of investment demonstrated lower levels of involvement in violent and property crime. The findings relating employment status and crime have been demonstrated before. The influence of specific employment characteristics or subjective measures of job quality, which gets at the heart of the micro-aspect of the labor market segmentation and crime perspective, have not been examined in previous research.

At the micro-level the labor market segmentation and crime perspective is very similar to Sampson and Laub's age-graded version of social control (Sampson and Laub 1990). My dissertation adds to the support that has been developing over the last decade for this perspective. Sampson and Laub's version of social control theory was developed contemporaneously with Hirschi's more recent work that provides an alternative explanation for the relationship between work and crime (Gottfredson and Hirschi 1990). In A General Theory of Crime , Gottfredson and Hirschi argue that both the development of investments and criminal behavior can be explained by an underlying trait representing self-control. This trait, thought to develop during pre-adolescence, remains fairly constant over the life course. It is this underlying construct that keeps individuals from developing meaningful investments and promotes criminal behavior. The current work does not support this interpretation of the relationship between employment and crime. Employment, employment quality, and schooling status influence criminal behavior even after previous misbehavior and educational achievement (two reasonable measures of self-

control) are held constant. If self-control could explain the relationship between employment and work, once these indicators are included in the model, the relationship should not be significantly different from zero.

At the macro-level, the perspective suggests that labor market opportunities may influence the individual-level relationships between work and crime both by further influencing individuals' sense of investment and by creating criminal opportunities. While this analysis cannot determine the degree to which each of these causal processes is operating, it does suggest that aside from the direct effects of context on individual-level crime, macro-labor market characteristics do influence the individual-level relationships between conventional investments and crime. The current research is the first time the variance of the individual-level relationships between work and crime has been regressed on county labor force characteristics using statistical techniques appropriate for multi-level data.

The De-Industrialization Thesis

The causal chain identified in the aggregate analysis is supportive of the de-industrialization thesis proposed by Wilson (1987, 1996). Wilson suggested that the movement of large scale manufacturing operations out of northern cities and into the southwest or overseas decreased the quality of employment opportunities among low skilled workers in the northern rustbelt cities. Opportunities shifted from well-paid union jobs to less stable and poorly compensated jobs in the service and retail sectors. In cities with large black populations, these changes played host to a variety of social problems, including educational failure, out-of wedlock births, concentrated joblessness, drug use, and crime.

While performing time series analysis to examine shifts in the industrial composition would more precisely parallel Wilson's theoretical propositions, indications of the availability of

jobs in different industries address the core of the process he described. Counties in which employment opportunities were more heavily concentrated in retail sector jobs had higher rates of unemployment and part-time employment. In urban areas, both of these led to higher rates of crime. These counties also demonstrated higher rates of community instability and racial segregation, both of which were positively related to violent and property crime rates in urban and rural areas. Adding further support to Wilson's propositions concerning the underclass was the finding that the effect of urban joblessness and part-time employment on crime was especially strong in counties with large populations of African-Americans. Holding constant geographical region, in urban counties with large black populations, joblessness and part-time employment had especially strong relationships with violent and property crime rates respectively.

Also supportive of Wilson's thesis and consistent with previous research is the finding that after controlling for geographical region, racial composition, and labor force patterns, more racially segregated counties had higher levels of violent and property crime. Shihadeh and Flynn's work (1986) suggests that this may be due to cultural isolation, economic disadvantage, and political dis-empowerment. I also added a number of interaction terms to the model which represented the multiplicative effects of segregation and labor force characteristics. Wilson's thesis would predict that the interaction of segregation and weak opportunity structures would have additional crime producing influences. This was not the case. The effects of segregation and weak labor force opportunity, while both positive, appear to be distinct.

Opportunity Theories

Criminal opportunity is often included in theories of criminal behavior. Yet, it is often excluded from empirical models due to difficult in identifying useful indicators of the concept. I too, am guilty of this exclusion. Gottfredson and Hirschi (1990) suggest that criminal opportunity

will explain much of the variance in individual crime that is not accounted for by self-control. The routine activities and crime perspective (Cohen and Felson 1980) argues that changes affecting the spatial and temporal distribution of human activity can alter criminal opportunities. These shifts will influence rates of crime. The current work begs more questions concerning criminal opportunity than it answers, yet it does make a number of suggestions.

I suggest that there are aspects of the employment and crime relationship that may be better explained by causal mechanisms related to opportunity verses motivation. Modeling the employment and crime relationship from an economic perspective has often lead to predictions that the influence of work on crime would be strongest when examining property crime. My dissertation suggests that this is not the case. While the motivation (or lack of deterrent forces) may have similar influences on violent and property crime, in some cases individuals with weak investments in employment appear to be more likely to commit violent crime, yet no more likely to commit property crime. At the aggregate level joblessness appears to increase violent crime and decrease property crime.

In addition to providing investments, employment at the individual and contextual level ca increase and decrease criminal opportunities. Higher levels of joblessness leaves fewer unguarded targets. The aggregate analysis suggests that this is more likely in rural areas. In urban areas, a larger percentage of the targets of property crime may be related to commercial establishments, which are less effected by joblessness. The social dynamics of urban areas may also inhibit collective guardianship. It is also possible that joblessness at the community level may encourage crime by facilitating large gatherings in public spaces. This may have more of an effect on violent crime, which is less dependent on unguarded targets, and in urban areas where large public congregations are more likely.

At the individual level employed respondents committed fewer violent crimes. Students were less involved in violent and property crime. As both school and employment are conceptualized as similar investments, these different effects may be the result of employees having greater opportunities to commit property crime. While offering few definitive conclusions, this dissertation suggests the potential importance of criminal opportunities in studies of employment and crime at both the individual and aggregate levels.

Avenues For Future Research

This dissertation answers some questions, leaves some unanswered, and begs others. The examination of both industrial composition and patterns of labor force opportunity at the macro level suggests the importance of a more multi-dimensional treatment of the labor market. While unemployment or joblessness is certainly important it is not the only factor worthy of consideration. However, the effects of other labor market characteristics, such as part-time employment, were not always consistent with predictions stemming from the theoretical perspectives. One potentially fruitful topic for future research would be to try to disentangle the various labor market characteristics and their different effects on crime. Joblessness and part-time employment are strongly correlated (r=.343) but at times they have very different influences on violent and property crime. This is especially true in rural areas. As I have suggested that this may be due to criminal opportunities, to the degree that it is possible, future research should include indicators of such processes. Measuring opportunity can be difficult at both the individual and aggregate level. Sticking close to the causal mechanisms suggested one approach would be to try to find indicators of gatherings in public spaces, and unguarded targets.

Exploring the conceptualization of employment at the individual level has also been informative. The findings stress the importance of non-economic job characteristics that

encourage a sense of investment in one's employment. The current research suggests that three sets of employment characteristics influence criminal behavior in an additive structure. A closer look at the degree to which each of the indicators comprising these sets influences crime may tell us more about the causal mechanism. I have suggested that their influence is primarily through their contribution to job quality and the development of investment. Do some job characteristics contribute to this investment more than others? Including direct measures of investment in future analyses would offer more insight into this process.

Perhaps one of the most important avenues of future research concerns the levels of analysis. In this dissertation I included individuals and the counties in which they lived. In some places, especially rural areas, counties can be quite small. However, in more urbanized areas focusing on counties may not truly capture some of the important contextual effects. These characteristics may be more salient at the neighborhood level. I have argued that patterns of employment at the county level will influence the distribution of human activity, influencing both perceptions of legitimate opportunity, and access to illegitimate opportunities. This is apt to be even more important at the neighborhood level, as the populations are more concentrated and homogenous. Ideally, future research would nest individuals within neighborhoods, which would, in turn, be nested in larger aggregates such as cities or counties. This structure would allow us to examine how macro-economic characteristics such as industrial composition influence the economic health and patterns of employment in neighborhoods. These neighborhoods would most likely have more direct effects on individual behavior than we observed when treating county as the most proximate context.

Conclusion

Collectively, these analyses support a number of claims concerning the relationship between employment and crime. First, it exists. The relationship between work and crime at the cannot be explained by an underlying construct related to individual personalities or cultural values. Even after controlling for a number of characteristics at the individual and aggregate-level, industrial composition, joblessness, and part-time employment at the macro-level, and employment status and employment quality at the micro-level influence crime.

Second, we can be fairly confident that while there is apt to be some reciprocal causation, the relationship cannot be explained entirely by the influence that crime has on future employment. At the individual level I included previous measures of misbehavior and lagged employment variables in the models to add to our confidence in the proposed causal direction. Third, this relationship cannot be explained through strictly economic mechanisms. Crime may in some cases serve as a substitution for legitimate wages, but the influence of work in deterring crime appears to go beyond the economic aspect of both employment and crime. This is supported both by the work characteristics that influence crime and by the types of crime that work influences.

Fourth, the aggregate-level relationships between work and crime cannot be explained entirely by individual-level mechanisms. There are macro characteristics of labor markets that influence individual crime above and beyond their influence on individual employment. Fifth, some of the individual relationships between work and crime vary across different contexts. Some are constant. In some cases the variance of the relationships that are not constant can be explained by county characteristics related to labor market opportunities.

Employment is an essential aspect of social life. The majority of adults spend most of their waking hours engaged in some type of work. At the individual level, it has the power to

shape our attitudes, influence our decisions, and determine our lifestyles. At the community level, employment structures social interaction, influences stability, and creates opportunity. Both its individual and community effects can influence crime. If the goal of the public is to decrease property and violent crime, focusing on investments in conventional activities may be a useful approach. Developing programs and policies that promote a sense of investment in employment is likely to lead to an array of socially beneficial outcomes. According to this research, one of these would be a decrease in criminal behavior.

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Appendix 3-A

Unstandardized Coefficients, Standard Errors (in parentheses), and Standardized Coefficients (in italics) for Regression Analysis of Mediating Variables on Industrial Composition and Other County Characteristics

N=538

	Violent Crime Model 1	Property Crime Model 1	Violent Crime Model 2	Property Crime Model 2	Violent Crime Model 3	Property Crime Model 3	Violent Crime Model 4	Property Crime Model 4	Violent Crime Model 5	Property Crime Model 5
Industrial Composition	18.493	116.64*	16.31	108.41	19.87	126.40*	9.10	95.81	10.48	103.54
	(10.96)	(58.33)	(10.76)	(57.86)	(10.99)	(58.41)	(10.37)	(57.97)	(10.31)	(57.96)
	.052	*.054*	*.046*	.050	*.056*	*.059*	*.026*	*.044*	*.029*	*.048*
Joblessness	360.21*	-4624.81***	-358.31	-7334.33***	361.83*	-4613.37***	-151.67	-6973.28***	245.41	-4896.88***
	(179.66)	(956.37)	(234.75)	(1262.29)	(179.49)	(953.98)	(227.07)	(1269.19)	(168.01)	(944.58)
	.067	*-.142*	*-.066*	*-.224*	*.067*	*-.141*	*-.028*	*-.213*	*.046*	*-.150*
Part-Time Work	-492.63**	2419.94*	-406.11*	2746.22**	-679.71**	1095.95	-358.61*	2829.22**	-717.74***	1003.33
	(183.40)	(976.28)	(180.89)	(972.70)	(224.83)	(1194.98)	(173.57)	(970.15)	(209.86)	(1179.84)
	-089	*.072*	*-.073*	*.081*	*-.122*	*.033*	*-.064*	*.084*	*-.129*	*.030*
Instability	105.10***	1097.94***	101.08***	1082.79***	106.04***	1104.60***	89.23***	1062.07***	89.12***	1063.39***
	(14.80)	(78.78)	(14.55)	(78.21)	(14.80)	(78.66)	(14.05)	(78.54)	(13.94)	(78.38)
	.286	*.493*	*.275*	*.486*	*.289*	*.496*	*.243*	*.477*	*.243*	*.478*
Segregation	199.00**	1829.71***	194.63**	1813.22***	199.29**	1831.76***	104.38	1655.52***	71.35	1520.17***
	(72.95)	(388.32)	(71.57)	(384.86)	(72.88)	(387.34)	(69.87)	(390.53)	(69.52)	(390.86)
	.091	*.139*	*.089*	*.137*	*.092*	*.139*	*.048*	*.126*	*.033*	*.115*
Total Population	.00011***	-.00006	.00012***	-.00005	.00011***	-.00004	.00010***	-.00008	.00010***	-.00006
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
	.177	*-.018*	*.183*	*-.014*	*.183*	*-.010*	*.162*	*-.020*	*.166*	-.017
Percent Black	1323.37***	4991.99***	1297.75***	4895.38***	1333.12***	5061.00***	877.96***	4161.88***	801.16	3765.52***
	(91.75)	(488.39)	(90.18)	(484.91)	(91.91)	(488.49)	(105.92)	(592.04)	(104.65)	(588.37)
	.506	*.315*	*.496*	*.309*	*.510*	*.319*	*.336*	*.263*	*.306*	*.238*
Percent Hispanic	470.79***	3097.28***	449.07***	3015.38***	474.33***	3122.32***	502.26***	3108.32***	517.26***	3226.87***
	(118.02)	(628.24)	(115.88)	(623.10)	(117.93)	(626.79)	(111.37)	(622.48)	(110.16)	(619.32)
	.119	*.129*	*.113*	*.126*	*.120*	*.130*	*.127*	*.129*	*.131*	*.134*

Continued on next page

Appendix 3-A - Continued

Percent Urban	175.49*** (36.72) *.198*	1462.85*** (195.47) *.272*	-571.27*** (165.12) *-.644*	-1353.11 (887.86) *-.252*	-52.24 (162.81) *-.059*	-148.90 (865.35) *-.028*	-219.56 (166.40) *-.248*	-738.59 (930.07) *-.137*	-213.25 (153.02) *-.240*	-541.01 (860.28) *-.101*
West	-57.30 (49.46) *-.053*	-590.98* (263.31) *-.091*	-43.97 (48.61) *-.041*	-540.71* (261.40) *-.083*	-61.35 (49.50) *-.057*	-619.66* (263.07) *-.095*	-7.34 (46.91) *-.007*	-476.71 (262.21) *-.073*	-6.69 (46.60) *-.006*	-486.55 (261.98) *-.075*
North-Central	-60.77 (32.24) *-.078*	-420.53* (171.64) *-.089*	-51.77 (31.69) *-.066*	-386.60* (170.42) *-.081*	-61.72 (32.22) *-.079*	-427.30* (171.25) *-.090*	-54.83 (30.40) *-.070*	-391.95* (169.86) *-.083*	-56.68 (30.07) *-.072*	-415.02* (169.07) *-.087*
South	-124.10*** (36.25) *-.170*	-1076.62*** (192.97) *-.243*	-109.65** (35.70) *-.150*	-1022.13*** (191.97) *-.231*	-126.43*** (36.25) *-.173*	-1093.09*** (192.67) *-.247*	-109.87*** (34.23) *-.150*	-1022.52*** (191.31) *-.231*	-121.05*** (33.83) *-.166*	-1080.00*** (190.22) *-.244*
*Urban*Jobless*	---------	---------	1732.86*** (373.92) *.827*	6534.50*** (2010.67) *.515*	----------	----------	641.07 (392.23) *.306*	4626.86* (2192.35) *.364*	----------	----------
*Urban*Pt-time*	---------	---------	---------	---------	589.11 (410.34) *.249*	4169.37* (2180.98) *.291*	---------	---------	632.18 (382.96) *.267*	1003.33 (1179.84) *.030*
*Urban*Jobless* % Black*	---------	---------	---------	---------	---------	---------	2622.64*** (382.28) *.329*	4582.44* (2136.73) *.095*	---------	---------
*Urban*Pt-time*% Black*	---------	---------	---------	---------	---------	---------	---------	---------	3948.53*** (445.11) *.393*	9615.78*** (2502.45) .158
Constant	123.37 (96.91)	4009.94 (515.84)	410.88 (113.52)	5094.13 (610.43)	196.93 (109.53)	4530.57 (582.17)	381.35 (108.92)	5042.53 (608.82)	371.19 (104.09)	4954.95 (585.19)
R Square	.623	.710	.638	.715	.625	.712	.668	.718	.674	.719

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

Appendix 4-A
Varimax Rotated Factor Patterns for Employed NLSY79 Respondents

Variable	*Factor Loading*
Rewarding Job Attributes Factor	
Goodinc	.622
Jsecure	.600
Maximize ability	.665
Promo ops	.649
Significant Work	.596
Eigenvalue: 2.262	
Percent Variance Explained: 37.7	
Employment Benefits	
Health Insurance	.912
Paid Vacation	.912
Eigenvalue: 1.665	
Percent Variance Explained: 83.3	
Poor Work Conditions	
Dangerous Work Conditions	.854
Unhealthy Work Conditions	.854
Eigenvalue: 1.459	
Percent Variance Explained: 72.9	

Appendix 4-B

Alternative Approaches to Modeling Non-Labor Force Involvement

I explored two other approaches to modeling the employment characteristics of individuals who were not currently in the labor force. Both of these strategies involve imputing labor market characteristics for non-working individuals based on their future work characteristics. I suggest that these indicators of future quality of employment could be thought of as the respondents' future expectations given their current situation. The first approach involves imputing the actual future job characteristics, taken from the 1982 wave of the NLSY for those individuals who were out of the labor force in 1979. Roughly nine hundred respondents who were not in employed in 1979 had entered the labor force by 1982. The same approach of imputing a constant and using a dummy variable to indicate missing values that was used in the original analysis was utilized for respondents who were still out of the labor force in 1982. While susceptible to the threat of endogeneity, these indicators are apt to be quite valid measures of the investments, or expectations, that a non-working individual would be risking by participating in crime.

When the models are re-analyzed after these imputations are made, the coefficients generated suggest that all three of the employment characteristic factors are significantly related to involvement in both violent and property crime. If the models are re-analyzed after the imputation process is altered, so that those respondents who were not working in 1979 are given the mean value of the 1982 employment characteristics of respondents who were of the same employment status as they were in 1979, the results are similar. With the exception of the effect of poor work conditions on property crime, all of the characteristics demonstrate significant

relationships with participation in violent and property crime. Both of these models can be viewed in Tables 4-B1 and 4-B2.

Table 4-B1

Multiple Regression Analyses of Criminal Involvement Variables on Background Measures, Commitments, Income, Previous Delinquency, and Employment Characteristics – Including Imputations Based on Individual Future Characteristics

	Violent Crime N=6460	Property Crime N=6372
Background Measures		
Age	-.054***	-.057***
Male	.212***	.168***
Black	.017	-.073***
Hispanic	-.043***	-.035**
Commitments		
Married	-.026	-.063***
Educational Achievement	-.062***	-.013
Currently Enrolled College	-.050**	-.055***
Currently Enrolled HS	-.035*	-.028
Living in Own Household	-.012	.026
Income		
Family Income	.001	.026
Individual Income	-.002	-.033*
Previous Delinquency		
School Trouble	.190***	.158***
Employment Status		
Employed	-.016	.013
College Student	-.004	.009
High School Student	-.019	-.026*
Managing Household	-.020	-.024
Enlisted in Military	.034	.021
Employment Involvement		
Part-Time Employment	.011	-.002
Employment Characteristics		
Employment Quality	-.030*	-.043**
Benefits	-.042*	-.043**
Poor Conditions	.067***	.038**
R Square	.152	.92

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

Table 4-B2
Multiple Regression Analyses of Criminal Involvement Variables on Background Measures, Commitments, Income, Previous Delinquency, and Employment Characteristics – Including Imputations Based on the Mean Future Characteristics of Each Category of 1979 Non-Workers

	Violent Crime N=6271	Property Crime N=6186
Background Measures		
Age	-.054***	-.056***
Male	.220***	.173***
Black	.018	-.073***
Hispanic	-.041***	-.035**
Commitments		
Married	-.031*	-.064***
Educational Achievement	-.058***	-.007
Currently Enrolled College	-.058***	-.061**
Currently Enrolled HS	-.038*	-.027
Living in Own Household	-.013	.022
Income		
Family Income	.001	.025
Individual Income	-.001	-.029
Previous Delinquency		
School Trouble	.194***	.158***
Employment Status		
Employed	-.002	.023
College Student	-.002	.006
High School Student	-.018	-.030
Managing Household	- .018	-.027
Enlisted in Military	.044*	.031
Employment Involvement		
Part-time Employment	-.009	-.002
Employment Characteristics		
Employment Quality	-.025*	-.039**
Benefits	-.039*	-.046**
Poor Conditions	.058***	.025
R Square	.154	.089

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