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**RURALITY AND CRIME:
IDENTIFYING AND EXPLAINING RURAL/URBAN DIFFERENCES**

A Dissertation in

Sociology

by

Laine O'Neill Briddell

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The dissertation of Laine O'Neill Briddell was reviewed and approved* by the following:

D. Wayne Osgood
Professor of Crime, Law, and Justice and Sociology
Dissertation Advisor
Chair of Committee

Eric Silver
Associate Professor of Sociology and Crime, Law, and Justice

Jeremy Staff
Assistant Professor of Crime, Law, and Justice

Diane McLaughlin
Professor of Rural Sociology

Julie Horney
Professor of Crime, Law, and Justice
Director of the CLJ Graduate Program

*Signatures are on file in the Graduate School

ABSTRACT

Rural crime is relatively understudied in criminology. Though most research finds that urban places have the highest crime rates and rural areas the lowest, little attention has been given to specifying this relationship. This neglect is particularly conspicuous in research on communities and crime. Although this approach, with its attention to community characteristics, would be particularly useful for understanding differences in crime rates of rural and urban places, research in this field has been limited almost exclusively to urban areas. This dissertation offers an initial step towards remedying this lack of attention to rural crime by using national data to examine differences in rural and urban crime rates. I identify variation in crime rates across a full range of rural and urban counties in order to clarify which aspects of rurality are most strongly associated with lower crime rates.

I also explore theoretical explanations for the differences in crime rates, focusing on social disorganization theory. If levels of social disorganization differ in rural and urban places, this may account for the differences in their crime rates. In addition, social disorganization theory is often put forth as a general theory, yet has been tested primarily in urban areas. The myriad differences between rural and urban places may contribute to differences in the effects of disorganization on crime rates.

To test this, I combine county-level data from several sources, including the Uniform Crime Reports, U.S. Census, County Business Patterns survey, and Religious Congregations and Membership Study. I find that controlling for structural antecedents of disorganization and measures of community social organization reduces differences between rural and urban crime rates; more urban counties generally suffer from higher levels of disorganization which partially explains their higher crime rates. I also find that the effects of measures of social disorganization

differ in rural and urban places; in general, they are better predictors of urban crime. This is particularly evident for poverty, which is positively associated with crime rates in urban counties, but in rural areas, is negatively associated with property crime and is not associated with violent crime. Overall, these results support the extension of social disorganization theory to rural counties, but suggest the need to adapt the theory to better predict crime across all locations.

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CHAPTER 1 INTRODUCTION

Though rural crime is relatively understudied in criminology, most research finds that urban areas tend to have the highest crime rates and rural places the lowest. Findings of lower rural crime rates date back to the beginning of the twentieth century; however, there is evidence in recent years that this gap is beginning to narrow, as rural areas have had smaller decreases or even increases in crime rates over time, compared to larger decreases in crime in urban areas. Unfortunately, despite these findings, little attention has been given to explaining exactly why rural crime rates differ from those in more urban areas. Furthermore, most of the existing research uses a simple dichotomy to measure rural or urban location, thereby obscuring the sizeable variations within rural America.

The neglect of rural areas in crime research is particularly conspicuous in research on communities and crime. Although this approach, with its attention to community characteristics, would be particularly useful for understanding differences in crime rates of rural and urban places, research in this field has been confined almost exclusively to urban communities. This perspective has its origins in Park, Burgess and McKenzie's (1925) analyses of Chicago. They argued that "rapid urban expansion" is associated with increases in crime and other indicators of social disorganization. They further described the expansion of the city as occurring in a series of concentric circles. Surrounding the central business district is a "zone of transition" which is associated with higher rates of poverty, mobility, and ethnic heterogeneity, all of which contribute to social disorganization, which in turn increases crime (Park, Burgess and McKenzie 1925; Shaw and KcKay 1942).

This approach clearly neglects rural areas, which do not generally take the same form of concentric circles. Though more recent research on communities and crime gives less attention to the geography of a neighborhood, focusing instead on elements like social capital and collective efficacy, most studies still retain the emphasis on urban areas (Browning, Feinberg and Dietz. 2004; Bursik and Grasmick 1993; Morenoff, Sampson, and Raudenbush 2001; Rose and Clear 1998; Sampson, Raudenbush, and Earls 1997; Silver and Miller 2004). This research generally focuses on a relatively small sample of cities, which is necessarily unrepresentative of the population as a whole and totally omits the 20% of Americans who live in rural places. The traditional concept of neighborhoods so prominent in this research simply does not apply to rural areas, and rural communities quite likely differ from the urban places included in existing studies in numerous other ways as well. Research on communities and crime needs to be broadened to consider the full range of communities, including rural ones.

This dissertation offers an initial step towards remedying this lack of attention to rural crime by identifying variation in crime rates across the full range of rural and urban locations. Specifically, I improve on prior research by using county-level data from across the United States to compare crime rates in rural and urban locations, and to identify variations among rural counties. I use data from the Uniform Crime Report for several different measures of county crime rates, including measures of property and violent crime. In order to clarify which aspects of rurality are and are not associated with lower crime, I compare a comprehensive set of measures of rural and urban location, including population size and density, adjacency to metropolitan areas, Urban Influence Codes, and Rural-Urban Continuum Codes, as well as the dichotomous measure of metropolitan or non-metropolitan location used in much of the prior research. By using several different measures of crime and a much more nuanced definition of

rural/urban location, I am able to more clearly specify the relationship between rurality and crime.

In addition to identifying variations in crime rates among rural and urban counties, I explore theoretical explanations for the differences between rural and urban crime rates. Prior research does not make clear exactly what about rurality matters; that is, *why* do rural places have lower crime rates? I focus on social disorganization theory as a potential explanation, grounding my application of the theory in writings about the distinctive features of rural communities. I control for both structural indicators of social disorganization and measures of community social organization, and test to what extent they account for urban/rural differences in crime rates. Furthermore, I explore the applicability of social disorganization theory in rural places. This theory is often put forth as a general theory, yet has been tested primarily in urban areas. I compare the effects of both structural and community measures of disorganization on rural and urban crime, to identify any differences in the effects of social disorganization by place. If these effects differ substantially for rural and urban crime, this may suggest that social disorganization is only applicable as a theory of urban crime, or that this theory should be updated or changed to reflect patterns of crime across all locations.

Rural and urban places: what is rurality?

The difference between what is rural and what is urban is not easily identified. There are two important questions to consider. First, are there meaningful differences between urban and rural places? Some researchers argue that as rural places have become more urbanized, these differences have disappeared, suggesting that the distinction between urban and rural is not useful. Other researchers contend that there are still meaningful differences between rural and

urban places. It is important to identify just how rural and urban places differ, as well as why these differences are important.

Second is the question of exactly what defines rurality; what sort of places should be labeled rural (or urban)? Scholars have questioned exactly how to specify rural and urban places, as there are no clear and consistent criteria. Falk and Pinhey (1978) argue that rurality is an analytic concept, rather than an empirical fact. This distinction is a useful one; it permits a variety of definitions of rural, as necessitated by the researcher.

Does rurality matter? Some scholars have questioned whether the distinction between rural and urban places is meaningful or useful. Though substantial differences between urban and rural were once taken for granted (Tonnie 1940; Wirth 1938), these differences are less clear to modern scholars.

While nearly all researchers agree that urban-rural differences are much smaller than in prior decades, some argue that there are no significant cultural differences (see Gilbert 1982). Advances in transportation and communication have reduced some of the physical barriers between urban and rural areas, while standardized schooling, a more global economy, and shared media and entertainment that span the nation have helped to reduce cultural differences (Brown and Cromartie 2004; Brown and Lee 1999; Ford 1978).

On the other hand, Brown and Lee (1999) contend that “metropolitan-nonmetropolitan differences are persistent and important.” In addition to smaller populations and lower population densities in rural areas, differences between urban and rural places include physical, demographic, social, and economic disparities. Rural areas tend to have higher unemployment and poverty rates as well as lower wages and educational attainment than metropolitan areas

(Galston and Baehler 1995; Stauber 2001). There are also differences in types of employment; rural residents are more likely to be employed in farming and manufacturing and less likely to work in managerial or professional positions, as compared to urban residents (Brown, Cromartie and Kulscar 2004).

There are other substantial demographic differences between rural and urban places. Rural populations are growing at a much slower rate than urban areas, in part because of relatively high rates of out-migration. Out-migration is particularly prevalent among young adults (age 20-29), creating a disproportionately older population in rural areas (Johnson 2006). Rural areas are typically less racially diverse than urban locations. Though the gaps are decreasing, rural areas are home to proportionally fewer minorities. Furthermore, minorities are not spread evenly across rural areas; some places have very few minorities, while others have large minority populations (Brown and Cromartie 2004).

Researchers also find cultural differences between rural and urban areas. For example, Johnson and Beale (1995) found that rural residents were more likely than their urban counterparts to espouse conservative values, and more likely to support conservative political candidates. While advances in communication, transportation, and available services have minimized the cultural distance between rural and urban places, differences still remain. Brown and Cromartie (2004: 281) suggest that “rural and urban areas are not so much differentiated by the presence or absence of particular institutions as by their diversity and capacity.” Rural residents may have fewer options across the board, from schools to local media. Government and other public services may be limited by budget constraints or a lack of leadership and skills (Brown and Cromartie 2004). The isolation of many rural areas also makes it hard to deliver services such as health care and other social services. Rural residents may lack access to

specialized medical care or be far from hospitals and doctors. As a result, compared to urban areas, rural areas have higher mortality rates for almost all age groups (Johnson 2006).

Thus, there are clear differences between urban and rural life, ranging from demographic and economic disparities to social and cultural diversity. These differences have real and important effects on rural residents, impacting their identity, attitudes, and behaviors (Bell 1992; Fitchen 1991).

What is rural? Though the term ‘rural’ may be used in a variety of ways: to describe a type of culture or worldview (Weisheit and Donnermeyer 2000) or to refer to a group of people or personal identity (Bell 1992), it most commonly describes a geographic area. Some definitions of rurality may be primarily qualitative, focusing on the perceptions of residents or observers, who may take into account elements such as shared conservative or traditional values, an emphasis on family, the presence or absence of ‘urban’ characteristics like heterogeneity and anonymity, and agricultural land use, as well as population characteristics like population size and density (Dewey 1960; Fitchen 1991; Berry, Markee, Fowler, and Giewat 2000; Bell 1992; Halfacree 2004).

Researchers and policymakers, however, typically rely on more quantitative measures of rurality (Brown and Swanson 2003; Cromartie and Bucholtz 2008). Two of the most common definitions are the U.S. Census’s dichotomy of urban and rural, and the measure of metropolitan and nonmetropolitan identified by the U.S. Office of Management and Budget (OMB). The U.S. Census identifies rural areas as those outside of urban areas of at least 2,500 people. “Areas” are defined based on settlement patterns, and may not coincide with municipal boundaries (Brown and Swanson 2003; Cromartie and Bucholtz 2008; ERS webpage 2009). OMB offers a county

level measure of metropolitan and nonmetropolitan areas, in which metropolitan counties are defined as those that contain an urban area of at least 50,000 people, as well as outlying counties that are economically tied to the central city (measured by at least 25% commuting: ERS webpage 2009). The remainder of counties are labeled nonmetropolitan.

These measures have several disadvantages. First is that both of these definitions focus on defining urban or metropolitan, leaving rural or nonmetropolitan counties as the residual (Brown and Cromartie 2004; Brown and Swanson 2003; Cromartie and Bucholtz 2008). As a result, rural places are defined not on what they share, but rather what they lack.

Furthermore, these dichotomous measures give somewhat arbitrary measures of what is rural (Cromartie and Bucholtz 2008). The U.S. Census identifies 21% of the population as living in rural areas, while OMB labels 17% as non-metropolitan. These numbers can easily be altered by shifting both the boundaries of places (i.e. land use Census areas vs. counties) as well as the population threshold. For example, if the Census Bureau identified urban areas as those with a population greater than 50,000, instead of the 2,500 threshold currently used, the rural population would increase from 21% to 32% (Cromartie and Bucholtz 2008).

Another related issue is the use of cut-points as opposed to continuous measures. For example, setting a criterion of a population of 50,000 people to define a metropolitan area assumes that there is a threshold effect; once a population reaches a certain size, it becomes metropolitan, while smaller places remain nonmetropolitan. In reality, it is more likely that the effects of population size are more linear, with characteristics of places changing gradually as population increases.

Attempts to remedy these drawbacks have led to more detailed measures of urban and rural location that attempt to identify variation within rural places. The Rural–Urban Continuum

and Urban Influence Codes are categorical measures that include several cut points for place size, rather than a single threshold (ERS webpage 2009; Ghelfi and Parker 1997). Both also incorporate other characteristics of rural places, including adjacency to metro counties and the presence of an urbanized area. By including more categories of nonmetropolitan counties, these coding schemes allow rural to be measured as more meaningful categories, instead of simply the non-urban residual.

However, because these measures incorporate several facets of rurality into a single categorical measure, they do not separate which characteristic (i.e. population size or adjacency to metro areas) is most strongly related to urban-rural variation in outcome variables. In addition, though these codings include more categories, they still assume that rural and urban variation can be adequately represented with categorical rather than continuous measures. Ideally, analyses should include a variety of measures of rural/urban location—both categorical and continuous, to identify which aspects of rurality are most important for a specific outcome.

CHAPTER 2 RURAL AND URBAN CRIME

Rural and urban crime rates

While there is a large body of research examining crime in urban areas, far less attention has been given to rural crime. There is reason to expect rural crime to be different from that in urban areas; rural and urban places differ on a variety of characteristics – demographic, economic, structural, and social – that are known to be correlated with crime. Unfortunately, there have been relatively few systematic examinations of rural-urban differences in crime rates. Although they are few, existing studies show a fairly consistent pattern; urban areas generally have higher crime rates than do rural areas, supporting the assertion that there are important differences between rural and urban places.

Findings of lower rural crime rates date back to the beginning of the 20th century (see Krohn, Lanza-Kaduce, and Akers 1984), when researchers were concerned with the effects of urbanization and suggested that urban areas fostered crime. Research consistently found that urban places have higher crime rates than rural places, as shown in Quinney's (1966) study using national data from the Uniform Crime Reports (UCR) on offenses known to police (from 1960-1961). He reported that he took "for granted that offense rates tend to be lower in rural areas as compared to rates in areas of greater population size and density" (pg. 45). He further noted that he expected this difference to decline as small communities became more urbanized.

Other researchers have noted similar concerns about changing crime rates in rural areas as the result of increasing urbanization. Research in the past several decades has used a variety of data sources to evaluate these claims.

Offense statistics:

Fischer (1980) observed that many scholars believed that “massification” (mass communication/transportation/media/etc.) had diminished differences between urban and rural places, and that the gap in crime rates should have declined as well. Fischer examined violent crime from 1955 through 1975, focusing on how violent crime and homicide rates varied by community size. Violent crime rates were highest in cities with populations greater than 250,000 people, and decreased with size (measured with 6 categories of city size, plus rural places), with towns of less than 10,000 and rural places having the lowest homicide rates. Rates of homicide and violent crime also increased over time, with the greatest increases seen in the larger cities. This served to increase the gap between urban and rural areas, which contradicted the hypothesis that over time, as rural areas became more urbanized, their crime rates would approach those of urban populations (at least for the time period from 1955 to 1975).

More recent research confirms that the gap between urban and rural rates of offending had not disappeared. Lee, Maume and Ousey (2003) compared homicide rates in metropolitan and non-metropolitan counties, using UCR data from 1990-1992, and found that the average homicide rate in metropolitan counties was nearly triple that of the non-metro counties. Though most research still finds lower crime rates in rural areas, there is also evidence that these rates are increasing relative to urban crime rates. For example, FBI data show that the national violent crime rate decreased between 1991 and 1997, but actually increased in non-metro areas (Barnett and Mencken 2002).

Rotolo and Tittle (2006) focused on population change in a sample of urban areas, comparing rates of six different types of crimes known to police from the UCR from 1960, 1970, 1980 and 1990. They found that using cross-sectional data, larger populations (indicated by a

continuous measure of city-size) were associated with higher crime rates. For several crime types, a quadratic measure of population size was also significant, indicating that the increase in crime with increasing city size levels off at some point. Rotolo and Tittle also examined change across each ten-year period and found that increases in population were often not significantly associated with changes in crime rates, and that in several cases, decreases in population were related to increases in crime. This provides some evidence that increasing urbanization may not lead to increases in crime rates. It is important to note that this research was limited to more urban areas (cities of at least 25,000 population), and the findings may not hold true in rural areas.

Barnett and Mencken (2002) conducted a county level analysis of property and violent crime rates, using UCR data averaged across 1989-91. They found that for both violent and property crime, the average rates across metropolitan counties are approximately double those in non-metropolitan counties. They also included measures of population size, density, and percent urban, and found that, with the exception of population density, increases on these measures predicted higher crime rates, though they did not attempt to tease apart these intertwined effects. In addition, Barnett and Mencken examined the effect of population change from 1980 to 1990, and found that population increases were associated with higher crime rates which, unlike Rotolo and Tittle's (2006) study, supports the idea that increases in the urbanicity of a place are associated with increases in crime.

Victimization data:

Because official statistics rely on police reporting, if reports to police or police practices vary systematically across rural and urban locations, comparative measures of crime rates could

be inaccurate. Victimization reports provide another source of data that are not dependent upon police reports. However, studies using victimization data find patterns of offending similar to those found in studies using UCR data, suggesting there may not be a systematic bias in reporting or police practices.

Laub (1983a) used data from the National Crime Survey (NCS, later the National Crime Victimization Survey or NCVS) to compare urban and rural victimization rates from 1973 to 1977. During these years, metropolitan areas (Standard Metropolitan Statistical Areas or SMSAs) had substantially higher rates of both violent and theft victimizations than did rural places (non-SMSAs, places with fewer than 50,000 people). A subsequent study by Bachman (1992) used NCVS data to extend this analysis through 1990, comparing the victimization rates of central cities, other metro areas, and non-metro locations (also using the Metropolitan Statistical Area classification). For both violence and theft, victimization rates were highest in central cities and lowest in non-metro areas; these differences remained relatively stable across the time period examined.

Juveniles:

Juvenile delinquency follows a pattern of urban/rural differences similar to adult crime rates. Early research from several different samples, some of them relatively small, generally found that rural youth have lower rates of offending and are involved in less serious delinquency than metropolitan adolescents (Lyerly and Skipper 1981). More recently, however, there is concern that delinquency is increasing in rural areas. For example, research on gangs in Nevada found that there were no urban/rural differences in gang membership, though urban youth still

reported feeling more threatened and concerned about violence (Evans, Fitzgerald, Weigel, and Chvilicek 1999).

Other research also showed that rural delinquency was increasing relative to urban delinquency. From 1980 to 1997, the proportion of juveniles among all arrests (both violent and property crime) decreased in city and suburban areas but increased in rural regions. In 1980, rural areas had a substantially lower proportion of juvenile arrests, but by 1997, they were only slightly lower than cities (Williams 2001). These findings are confirmed by analyses of self-report data from the National Longitudinal Survey of Youth. In 1980, urban youth had higher rates of involvement in 9 out of 11 delinquent behaviors than did rural youth (there were no significant differences on the other two). By 1997, there were significant differences on only four of these behaviors (Williams 2001).

While there are still clear rural/urban differences in adult crime, these have nearly disappeared for juvenile delinquency. One possible explanation is that measures of juvenile delinquency tend to be more heavily weighted towards less serious (and more common) behaviors, while adult crime rates are based on more serious incidents. It may be that rates of more minor delinquency are now consistent across locations, but there are still differences in serious crime, indicating that perhaps rural areas are still only partly “urbanized.”

This is consistent with research on substance use by urban and rural youth. Rates of alcohol use are similar for both rural and urban youth, while rural marijuana use approaches that of urban adolescents. However, with the exception of inhalants and stimulants, rural youth use harder substances like cocaine, crack, heroin, or hallucinogens at lower rates than urban youth (Donnermeyer 1992). This suggests that rates of minor delinquency are similar in urban and rural locations, while more serious incidents are more common in urban areas.

Limitations of Prior Research:

These studies provide relatively consistent evidence that rural places have lower crime rates than urban areas. These findings hold true over time, and across a variety of sources of data. There are some limitations to this body of research, making it important to build and expand on these studies.

First, there is a lack of attention to measures of rurality. Many of the above studies use a single dichotomous variable or a three-category measure to identify urban/rural location. By relying on such a limited measure of rural or urban location, these studies are unable to identify variation in crime rates within varying levels of rurality or urbanicity. Fischer (1980) and Rotolo and Tittle (2006) allow for greater variation, but Fischer combines all cities with a population under 10,000, ignoring variation in rural places, while Rotolo and Tittle exclude all cities under 25,000 people, completely ignoring rural places. Though Barnett and Mencken (2002) include a variety of measures of rurality, they treat most of them as control variables, and do not make any attempt to tease apart the independent effects of each facet of rural/urban location.

A second limitation to research on rural crime lies in the measures of crime. Some of the studies examine homicide rates; homicides tend to be consistently reported across places, making them useful for national studies, but they represent only a single type of crime. The majority of studies of urban and rural crime rates include an index of property crime and/or violent crime. By using an index of several crimes, researchers are able to minimize the idiosyncratic variations of a single crime type. On the other hand, these indexes could conceal meaningful urban/rural variation across different crimes. One study (Rotolo and Tittle 2006) separately examined six different crimes, and found that the effect of population size did vary by crime type, indicating that it is important to look for variation in the rural/urban differences for various crimes.

This study builds on and expands prior research by including a wide variety of measures of rurality and crime. By conducting a systematic comparison of numerous measures of urban and rural location, I am able to better specify how crime varies across places, and which elements of rurality are relevant for crime. In addition, by comparing a wide variety of measures of crime, I am able to identify systematic variations in differences between rural and urban crime rates. Better specification of these urban/rural differences is useful for understanding why crime rates vary by location.

Explaining rural and urban crime rates

Though it is a small literature, research finds consistent rural/urban differences in crime rates; rural places generally have lower crime rates. There is less research that focuses on explaining crime in rural places, and even less that attempts to account for rural/urban differences. Rural and urban places differ on a wide variety of characteristics, many of which are correlated with crime; this provides a multitude of potential explanations for the disparities in crime rates.

Explaining rural crime and accounting for rural-urban differences are important for two main reasons. First, the lack of research on rural crime has theoretical implications. Many theories in criminology, particularly ecological theories, are tested solely or primarily on urban samples. Other research may include rural residents, yet fail to distinguish urban or rural location in analyses (Weisheit and Wells 1996). By excluding rural residents or ignoring rural location, researchers assume that explanations of urban crime can be generalized to the whole population; this assumption, however, remains largely untested.

Conclusions about crime based on urban areas may not hold true in rural places. One example of this is the relationship between guns and crime; it is suggested that the availability of guns promotes crime, yet in rural places where gun ownership is common, guns are less likely to be used in violent crimes (Weisheit and Donnermeyer 2000). If criminological theories cannot account for both rural and urban crime, they are necessarily limited and are only theories of urban crime, rather than theories of crime in general (Weisheit and Donnermeyer 2000; Weisheit and Wells 1996).

Secondly, there are also more practical consequences of the lack of attention to rural crime. Over 20% of the nation's population lives in rural places, which account for about 70% of the land in the United States. Because these rural people and places are ignored by most research on crime, they are also not taken into account by policy makers. This is particularly problematic if, as described above, theories of urban crime are not generalizable to rural populations. This is likely to result in policy approaches that are inappropriate or ineffective for rural crime. For these reasons, it is essential to test the applicability of criminological theories to rural crime, and to attempt to account for urban/rural differences in offending.

Criminological theories include both individual and community level explanations of crime. Some researchers have extended individual level theories such as routine activities, social bonding, and social learning theories to include rural respondents (Krohn, Lanza-Kaduce, and Akers 1984; Lee and Alshalan 2005; Lysterly and Skipper 1981; Spano and Nagy 2005). Though this research is quite limited, it generally supports the applicability of these theories for rural as well as urban crime and criminals. In this study, I focus on community level explanations, using characteristics of rural and urban locations to account for differences in their crime rates. I give particular attention to social disorganization theory as an explanation for the differences in crime

rates in rural and urban places. I also test for compositional effects as an alternative source of rural/urban differences; rural and urban crime rates may vary because their populations are demographically different.

Compositional Differences:

It is possible that differences in crime rates may be due to compositional differences between urban and rural populations. Rural and urban locations are demographically different from one another in terms of variables such as the race and age of their residents. If these demographic variables are also related to crime, it is possible that urban/rural differences in the crime rate reflect compositional effects due to demographically different populations in urban and rural areas. For example, minorities and younger people tend to have higher rates of crime and delinquency, and these two groups tend to be underrepresented in rural populations.

Crime rates are highest among late adolescents and young adults, though there are some differences by crime type; for example, property offending peaks around age 16 while violent offending peaks at about age 18 (Sampson and Laub 1992). Although there may be some differences, the age-crime curve is largely invariant over time and social context (Hirschi and Gottfredson 1983). Rural places tend to have an older population than more urban areas, in part because of relatively high rates of out-migration among young adults (age 20-29). Combined with in-migration of older residents, this creates a disproportionately older population in rural areas (Johnson 2006).

Thus, we may expect urban areas to have a higher rate of offending if they also have a higher proportion of younger residents who, by virtue of their age, are more likely to engage in criminal behavior. However, Laub (1983a) examined patterns of violent and property offending

by age across urban and rural areas and he found that for every subgroup, rates of offending were lower in rural areas. The age patterns of offending were remarkably consistent across location, and crime rates were simply lower in rural places at all ages. This suggests that rural and urban offending is quite similar and that the composition effect of age is unlikely to fully account for rural/urban differences in offending.

Rural and urban places also differ in terms of their racial composition, and to the extent that race is correlated with crime, this could account for rural/urban differences in crime. Rural populations are disproportionately white: 82%, compared to 66% in metropolitan areas in 2000. Through African-Americans are still a larger group than Hispanics in rural places (unlike in urban areas), the Hispanic population is growing at a much faster rate, a result of migration and higher fertility rates, which may have implications for the effects of race in rural places in the future.

Laub (1983a) examined the relationship between race and crime, and found that African-Americans did have higher violent and property crime rates than whites. As there are more African-American residents in urban areas, this may have some impact on the overall crime rates of urban areas. However, Laub examined rural crime rates by race and found that both African-Americans and whites have lower rates of offending in rural areas, which means that in terms of race, compositional differences are unlikely to account for all of the urban/rural differences in crime.

Though Laub's findings indicate that compositional effects cannot fully account for urban/rural differences in crime, variations in the age, race, and gender composition of urban and rural populations may still account for some of the differences in their crime rates.

Social Disorganization Theory:

With its focus on community characteristics, social disorganization theory provides a potential explanation for differences in crime rates between urban and rural places. This theory has its roots in urban Chicago neighborhoods in the early part of the 20th century (Park, Burgess, and McKenzie 1925; Shaw and McKay 1942). Researchers observed that crime rates were consistently higher in certain areas of the city. Burgess, Park and McKenzie (1925) labeled these places, located between the business and residential areas, as the “zone of transition.” This zone was characterized by high rates of poverty, population turnover, and ethnic heterogeneity and these predicted higher crime rates. These early researchers theorized that these structural characteristics increased social disorganization, which in turn increased crime rates.

More recent research has found that family disruption is also associated with higher crime rates (Sampson 1985; Sampson and Groves 1989). Together, these four variables (concentrated disadvantage, residential mobility, ethnic heterogeneity, and family disruption) are structural antecedents of social disorganization, which predict higher crime rates in a community. Early models of social disorganization theory did not actually measure social disorganization; rather, they assumed that disorganization was the mechanism linking the structural measures to crime rates.

Subsequent research has given more attention to specifying the mechanisms that link structural characteristics to crime rates. Numerous researchers have attempted to identify mediators of this relationship by measuring a community’s level of social organization. Some early discussions focused on social control (Bursik 1988; Kornhauser 1978); economic disadvantage, residential mobility, and ethnic heterogeneity were said to increase disorganization by reducing the ability of a community to exert social control (ranging from surveillance to

intervention) over residents. Other early researchers proposed a systemic model; structural characteristics such as residential stability promote friendship bonds and network ties within a community, which strengthens the community and its capacity to control crime (Kasarda and Janowitz 1974; Sampson 1988).

Researchers have also examined community involvement, and found that participation in local organizations and voluntary associations were also useful indicators of social disorganization, and were predictive of community crime rates (Morenoff, Sampson, and Raudenbush 2001; Sampson and Groves 1989). These studies have identified a variety of measures of social disorganization that help to specify the relationship between structural indicators and crime rates.

Sampson, Raudenbush and Earls (1997) combined several of these themes into a single concept, which incorporated indicators of social cohesion and informal social control. They defined collective efficacy as “social cohesion among neighbors combined with their willingness to intervene on behalf of the common good” (pg 918). Numerous studies have found that collective efficacy (typically measured by survey questions about a respondent’s neighborhood) does in fact mediate the effects of economic disadvantage and residential instability on crime (e.g. Browning, Feinberg, and Deitz 2004; Sampson, Morenoff, and Earls 1999).

All of the studies described above are based solely on urban samples, limiting their generalizability to rural places. Though early research by Thomas and Znaniecki (1958 [1927]) proposed social disorganization as an explanation for the higher crime rates found in urban areas, as compared to more rural places with less crime, subsequent studies of social disorganization focus almost exclusively on urban areas (particularly Chicago). It has been suggested that social disorganization theory explains differences in crime rates between urban and rural places

(Ruback and Menard 2001), but this remains generally untested. Some studies, however, have examined the effects of social disorganization on rural or non-metropolitan areas, and their findings do generally support the application of social disorganization theory to rural areas.

Structural antecedents of social disorganization in rural places: Most research on social disorganization theory focuses on four structural antecedents of social disorganization (poverty, residential instability, ethnic heterogeneity, and family disruption), which have been shown to predict crime in urban communities. Though they are few, studies that test social disorganization theory in rural communities generally find these structural measures are significantly associated with crime rates (Barnett and Mencken 2002; Bouffard and Muftic 2006; Lee, Maume, and Ousey 2003; Osgood and Chambers 2000; Petee and Kowalski 1993).

Osgood and Chambers (2000) examined the effects of residential instability, poverty, ethnic heterogeneity, and family instability on juvenile violence, and found that all except poverty were correlated with violence. They noted that the lack of relationship between poverty and violence does not contradict social disorganization theory. In urban areas, poverty is positively correlated with residential instability, but the reverse is true in rural areas. As a result, it appears that residential instability may be a stronger predictor of social disorganization than poverty in rural places. Similarly, Lee, Maume, and Ousey (2003) examined the effects of structural disadvantage on crime, focusing on the effects of socioeconomic disadvantage and poverty concentration on homicide. These researchers found that although both socioeconomic disadvantage and concentrated poverty increased rates of homicide in urban areas, only socioeconomic disadvantage had an effect in rural areas.

Other researchers found that resource disadvantage (measured by poverty rate, income inequality, unemployment, female headed households) was significantly and positively

correlated with both violent and property crime in non-metropolitan areas (Barnett and Mencken 2002). This body of research, though limited, clearly supports the relevance of social disorganization theory in rural areas as well as for urban locations, for outcomes ranging from property to violent crimes, and from homicides to reports of incivilities.

While this research demonstrates the usefulness of social disorganization for predicting rural crime as well as urban crime, the details of these relationships are less clear. Compared to urban communities, rural places tend to have lower rates of female-headed households (McLaughlin, Gardner, and Lichtner 1999), populations that are less racially diverse, and higher levels of residential stability (U.S. Census). Though rural places tend to have higher levels of poverty than urban places, overall, these structural measures indicate that rural places are less socially disorganized than urban areas in most respects. This dissertation will test whether these structural antecedents of social disorganization may account for the lower crime rates found in rural areas.

There is also some evidence that the strength of relationships of these structural variables with crime may vary across urban and rural locations. For example, poverty is negatively correlated with residential instability in rural places, yet positively correlated with instability in urban areas. Because the relationship between these measures varies between rural and urban locations, their effects on crime are likely to vary as well. Osgood and Chamber's (2000) findings suggest that poverty may not be a strong predictor of disorganization and crime in rural places, as it is in urban areas. Barnett and Mencken (2002) used measures of minority population, population change, and resource disadvantage to predict violent and property crime. They ran separate models predicting crime rates in metropolitan and non-metropolitan counties and there appear to be differences by location in the magnitude of the effects of their social

disorganization variables. The authors did not provide significance tests for these differences, so it is unclear whether these urban/rural differences are statistically significant. Overall, though there is reason to believe that the strength of the relationships between crime rates and structural indicators of social disorganization may vary across urban and rural places, this remains untested. This dissertation will address this question, identifying how structural measures of disorganization are related to crime rates across the spectrum of rural and urban places.

Measures of community social organization in rural places: Social disorganization theory suggests that concentrated disadvantage, residential instability, ethnic heterogeneity, and family disruption lead to disorganization within a community, which in turn contributes to higher crime rates. Recent research has focused on measuring disorganization, going beyond structural indicators to include measures of social networks, community involvement, and collective efficacy as mediators of the relationship between structural variables and crime rates. While supported by research in urban areas, these relationships have been addressed by only a few studies of rural areas.

In their examination of collective efficacy in rural places, Reisig and Cancino (2004) found that residents in rural locations who were living in areas characterized by lower levels of collective efficacy (measured by survey questions about social control and cohesion with the neighborhood) were more likely to report higher levels of incivilities in their communities. Furthermore, this effect of collective efficacy partially mediated the negative effect of economic disadvantage. Though this supports assumptions about the relationships between social disorganization and crime, the study did not actually include crime rates as an outcome. Thus, these findings are merely suggestive about the connection of collective efficacy to crime in rural settings.

Lee and colleagues have examined the effects of a variety of community characteristics on crime in rural places. Lee and Bartkowski (2004b) focused on the effect of the presence of civically engaged religions on juvenile homicide rates. They posited that religious communities are important “for the cultivation of social ties and the facilitation of civic engagement” (pg. 1004), and may increase social organization. Lee and Bartkowski found that the presence of these groups did in fact predict crime in rural places, but not in urban counties.

In a subsequent study of rural counties, Lee (2006) examined the effect on the violent crime rate of the overall rate of adherence to religion and the number of churches per 1000 population, in addition to the rate of adherence to civically engaged religions. All three were negatively correlated with crime, which further supports the importance of religious involvement as a measure of community organization. Lee (2008) also used measures of civic engagement (voter turnout and number of civic associations per 1000 residents) as well as investment in the local economy and an independent middle class to predict violent crime rates. He found that these measures of community involvement were significantly associated with decreases in crime.

Existing research on rural areas generally supports the model of social disorganization found in urban research; both structural antecedents and measures of community context are associated with crime rates in rural areas. However, research is lacking on the details and implications of these relationships: how they vary across urban and rural places, and to what extent they explain urban/rural differences in crime rates. Prior research has also done little to compare the effects of structural measures and more direct measures of disorganization; most studies tend to focus on one or the other.

Lee (2008) does use a variety of measures to model rural violence; these include structural antecedents of disorganization, such as poverty, female-headed households,

unemployment and home-ownership, as well as measures of community organization, including voter turnout, and civic and religious associations. However, this study only included non-metropolitan counties, making it impossible to examine urban/rural differences, and also combined these measures into factors, which leads to difficulties in teasing apart the effects of structural and community measures of disorganization. This dissertation will use similar variables, but by including each measure separately and comparing both metropolitan and non-metropolitan counties, will be able to better examine how the effects of structural measures and measures of community social organization vary across rural and urban places, and to what extent they account for urban/rural differences in crime rates.

The present study

In this study, I use county level data to identify how crime rates vary by rural/urban location. In doing this, I expand and improve on previous research in four main ways. First, I specify the relationship between crime and location in much more detail, by testing several different components and measures of rurality. Rather than using a simple dichotomy, I define rural and urban categories by numerous population characteristics that distinguish more levels and aspects of rurality and urbanicity; it is important to tease out exactly which features of rurality contribute to differences in crime rates. Next, I test a wide variety of explanations for differences in the crime rates of rural and urban counties. I focus on social disorganization theory and include measures of structural antecedents of disorganization as well as community social organization. I explore the relationships between these measures, as well as their relationship with crime and discuss the theoretical implications of those findings.

In addition, I include a wider variety of measures of crime rates than most past research; I use indexes of property and violent crime, as well as examining each offense separately. The differences between rural and urban crime rates may vary across such diverse categories of crime, and it is useful to identify these patterns. Lastly, I update this line of research by using more current data; while most previous analyses only examine crime rates to 1990, I extend this through 2000. As rural areas continue to change and develop, it is important to use the most current data possible for understanding the nature of the urban-rural contrast today.

The primary goal of my research is to identify exactly what it is about rurality that accounts for differing crime rates in rural and urban places. This breaks down into several research questions. My first question is: *how do crime rates vary across rural and urban places?* Measures of rurality include several components, such as population size and density, as well as adjacency to metro areas. I look at each of these measures separately to see which pieces are most important, or most strongly related to crime rates. In addition, the majority of research on rural and urban places uses either a dichotomous (metropolitan/non-metropolitan) or a three-category (central city/other SMSA/non-SMSA) measure of location. Researchers have acknowledged some of the problems in using such broad categories; there is variation within urban and rural areas that is not accounted for (Laub 1983a) and greater differences among places might become apparent if rural areas were further sorted by population size (Bachman 1992). I attempt to fill this gap by testing a variety of measures of rurality, including more detailed, multi-category coding schemes that combine several population characteristics. By comparing several measures of rural/urban location, including individual components, a simple dichotomy, and categorical measures, I will be able to better specify relationships between rural/urban location and crime. Thus, I hypothesize the following:

Hypothesis 1: More urbanized places will have higher crime rates than rural places.

1a: Metropolitan counties will have higher crime rates than non-metropolitan counties.

1b: Non-metro counties that are adjacent to metro counties will have higher crime rates than non-metro counties that are not adjacent to metro counties.

1c: Counties with a greater proportion of urban residents will have higher crime rates than counties with less urban populations.

1d: Counties with a greater population density will have higher crime rates.

1e: Counties with a larger population will have higher crime rates.

Second, I focus on *explaining differences between rural and urban crime*. Rural and urban places are demographically different from one another in terms of the age, race, and gender compositions of their populations. Rural places tend to have fewer minority residents on average, as well as older populations. As a result, I expect that controlling for the demographic composition of counties may reduce differences in crime rates between rural and urban populations.

Hypothesis 2: Demographic characteristics will account for some of the rural/urban differences in crime rates.

Social disorganization theory is often offered as an explanation for why crime rates vary across places, and it has been supported by much research on urban crime, as well as a handful of studies on rural crime. This research has not been extended to compare rural and urban crime rates or to compare the effects of measures of social disorganization across rural and urban places. This dissertation improves and builds on prior research on social disorganization theory in rural areas in two main ways. First, I test and compare the effects of social disorganization across a full range of rural and urban counties, rather than only in non-metropolitan counties (as in Barnett and Menchen 2002; Lee 2008; Osgood and Chambers 2000). I also provide a

systematic analysis that includes both structural antecedents of disorganization as well as measures of community organization.

Social disorganization theory is typically represented by four structural measures—economic disadvantage, residential instability, ethnic heterogeneity, and family disruption—that are assumed to increase social disorganization, which in turn predicts higher crime rates. Researchers have also attempted to measure the level of social organization of a community in order to identify mediators of the relationship between structural characteristics and crime. Research in urban areas has identified a variety of significant predictors of crime rates, including social networks, community organizations, and collective efficacy (social cohesion and informal social control).

I expect that structural measures (economic disadvantage, residential instability, ethnic heterogeneity, and family disruption) will be positively related to crime and that measures of community social organization will be negatively associated with crime rates. I further expect that measures of community organization will partially mediate the relationship between the structural antecedents of disorganization and crime rates.

Though a small number of studies explore the relationships between community organization and crime in rural places, there have been no systematic evaluations of the effects of both structural characteristics and measures of a community's social organization on crime in rural and urban areas. I expect that my measures of social disorganization will help to account for differences in crime rates between rural and urban places. Though rural places have high levels of poverty, they tend to have less residential mobility, ethnic heterogeneity, and family disruption than urban areas. As a result, I expect that controlling for these will reduce rural/urban differences in crime.

I focus on community involvement as an aspect of social organization, and I assess involvement through measures of community associations and groups, charitable organizations, religious involvement and civic engagement. I expect that these measures of involvement with the community will predict crime rates in rural and urban places. Insofar as rural areas tend to be more integrated and organized than urban places, I expect that measures of community involvement will help to account for some of the variation in crime rates across locations.

Hypothesis 3: Structural measures of social disorganization will account for some of the differences between rural and urban crime rates.

Hypothesis 4: Measures of community social organization will partially account for the rural/urban differences in crime rates (beyond the effect of structural measures).

In addition, I hypothesize that the meaning of both structural characteristics and measures of community social organization will differ between rural and urban areas, and so I expect that the effects of these measures will vary by rural/urban location. For example, prior research has shown that poverty is positively correlated with residential instability in urban places, but negatively correlated in rural places; as a result, residential instability may have different meanings in different places. Similarly, though urban places generally have lower levels of poverty than rural areas, the long history of rural poverty and closer ties to kin in such areas may help rural residents reduce the negative effects of poverty. Because of this, the relationship between poverty and crime may be different in rural and urban places.

However, just as the relationships between structural characteristics and crime may differ between rural and urban areas, I expect the relationships between structural measures and measures of community social organization to vary. For example, if a history of rural poverty

has made rural areas better equipped to cope with disadvantage, poverty may not predict less community involvement in rural areas.

Hypothesis 5: The effects of structural antecedents of social disorganization will vary with the level of rurality of a county.

Hypothesis 6: The effects on crime of community measures of social organization will vary between rural and urban places.

CHAPTER 3 DATA AND METHODS

Sample

My sample includes all of the counties (and county equivalents) in the continental United States in 2000; I exclude Alaska and Hawaii because they seem substantively different from other states. I use FIPS (Federal Information Processing Standard) codes to merge county level data from several sources.

The dependent variables, crime rates, come from the Uniform Crime Reports (UCR). Measures of rural/urban location are from several sources. The Economic Research Service (ERS) has developed two classifications to measure rural/urban location: the Urban Influence Codes (UI) and the Rural-Urban Continuum Codes (RU). I will also use the metro/non-metro dichotomy as defined by the Office of Management and Budget (OMB), as well as measures of percent rural and population size and density from the 2000 U.S. Census. Demographic measures and other explanatory variables are also taken from the 2000 U.S. Census, as well as other sources including the U.S. Census County Business Patterns and the Religious Congregations and Membership Study. All measures are described below.

Measures

Crime:

My outcome variables are measures of crime, from the Uniform Crime Reports (UCR). I focus on crimes reported to the police and conduct separate analyses for property and violent crime rates. Property crimes include burglary, larceny, and motor vehicle theft. The violent crimes included are homicide, aggravated assault, and robbery. I exclude rape, as prior research

has shown it to be particularly under-reported in rural areas (Ruback and Menard 2001). In addition, I examine each of these crimes separately to confirm that my findings are consistent across crime types.

My analyses use U.S. Census data from 2000, so I average 2000-2002 crime data. This helps to reduce the effect of random fluctuations and missing data and will provide a more reliable estimate of crime rates. UCR data from 1999 uses county definitions from 1990, while subsequent years use definitions from the 2000 Census. As a result, it is more appropriate to use a three-year average from 2000-2002 instead of the more conventional 1999-2001 average (Lee, Maume, and Ousey 2003).

Recent changes in imputation method serve to improve data from the UCR. Until 1994, agencies that reported fewer than six months of data were not included in the UCR data, while agencies with at least six months of data had their total number of crimes estimated by weighting by the number of months reported. Beginning in 1994, however, this estimation method was used for agencies with at least three months of data. For agencies that report 0, 1, or 2 months of data, a crime count is estimated based on the crime rate of similar agencies, adjusted by population size (Maltz and Targonski 2002; UCR Codebook 2000). In addition, a “Coverage Indicator” is included in the data; this represents the proportion of data that is not imputed (UCR Codebook 2000). I limit my analyses to counties reporting at least 50% of their data; this excludes 266 counties (234 of which reported no data), leaving a sample of 2838 counties.

Rural/Urban Location:

In an attempt to tap into the important elements of rurality, I use a number of different indicators of rural/urban location: measures of population size, density, and percent urban, as

well as whether a county is metropolitan and/or adjacent to a metropolitan area. The first variables come from the 2000 U.S. Census. These include measures of population size and density of a county, as well as the percent urban. The U.S. Census classifies census blocks as “urban” if they are located in an urbanized area (UA, or an urban center with 50,000 or more people) or an urban cluster (UC, or a place with at least 2,500 but fewer than 50,000 persons). This is used to calculate the percent of the population of a county that is urban. For the 2000 U.S. Census, the Census Bureau altered how they identified UAs and UCs, increasing the number of small towns labeled as urban, therefore increasing the population identified as urban and reducing the rural population, as compared to prior definitions (ERS webpage).

Table 1: Measures of Rurality

	N	Minimum	Maximum	Mean	Std. Dev.	Mean Metro Counties	Mean Non-Metro Counties
Population size	2838	67	9,519,338	95,346.51	305,991.47	221,306.54	24,459.31
Population density (per sq. mile)	2838	0.1	66,940.1	261.93	1,752.57	646.87	45.29
Proportion urban	2838	0.0	1.0	0.412	0.311	0.599	0.307

The next measure is determined by the Office of Management and Budget (OMB) and uses Census information about population size, density, commuting patterns and other information to identify counties as metropolitan or non-metropolitan. Counties are considered as metropolitan if they have an urbanized area of at least 50,000 people and total population of at least 100,000. Surrounding counties are included in the metropolitan designation if they are economically tied to the central county by a commuting rate of at least 25% (ERS webpage). This is the coding scheme used by most prior research, and I include it as a comparison to the more complex rural/urban definitions. This measure also changed in 2000, when OMB added a new micropolitan designation (a non-metropolitan county with an urban center of at least 10,000

people), as well as loosening their definition of metropolitan (prior definitions required outlying counties to be economically tied to the central metro county and display a “metropolitan character”). Similar to the changes made by the Census, this resulted in a decrease in the number of counties identified as non-metropolitan (ERS webpage).

The last two measures of rurality were developed by the Economic Research Service (ERS). The first, the Rural Urban Continuum (RU, also known as the Beale code) is a 9 category scale that identifies counties based on their population size and adjacency to metro areas. The Urban Influence Code (UI) is similar and includes 12 categories that also take into consideration the size of the adjacent metro area, as well as the new micropolitan concept. Like the RU, the 2003 version of the UI is based on 2000 Census data. The details of the RU and UI codes, as well as the number of counties in each category, are listed in Table 2 below.

Table 2: Rural Urban Continuum and Urban Influence Codes

Rural-Urban Continuum Codes, 2003		Number of counties
Metro Counties		(1022)
1	Counties in metro areas of 1 million population or more	385
2	Counties in metro areas of 250,000 to 1 million population.	305
3	Counties in metro areas of fewer than 250,000 population.	332
Non-metro Counties		(1816)
4	Urban population of 20,000 or more, adjacent to a metro area.	208
5	Urban population of 20,000 or more, not adjacent to a metro area.	93
6	Urban population of 2,500 to 19,999, adjacent to a metro area.	558
7	Urban population of 2,500 to 19,999, not adjacent to a metro area	386
8	Completely rural or less than 2,500 urban population, adjacent to a metro area	205
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area	366
Total		(2838)
Urban Influence Codes, 2003		Number of counties
Metro Counties		(1022)
1	In large metro area of 1+ million residents	385
2	In small metro area of less than 1 million	637
Non-metro Counties		(1816)
3	Micropolitan area adjacent to large metro area	88
4	Noncore adjacent to large metro area	111
5	Micropolitan area adjacent to small metro area	280
6	Noncore adjacent to small metro area and contains a town of at least 2,500 residents	326
7	Noncore adjacent to small metro area and does not contain a town of at least 2,500 residents	163
8	Micropolitan area not adjacent to a metro area	241
9	Noncore adjacent to micro area and contains a town of at least 2,500	177
10	Noncore adjacent to micro area and does not contain a town of at least 2,500 residents	174
11	Noncore not adjacent to metro or micro area, contains a town of at least 2,500 residents	118
12	Noncore not adjacent to metro or micro area, does not contain a town of at least 2,500 residents	138
Total		(2838)

Demographic Measures:

All demographic measures come from the 2000 U.S. Census. Because males and young people have the highest crime rates, I include controls for the *proportion male* and the *proportion aged 15-29* in a county (all descriptive statistics are listed in Table 3 below). I also include measures of the racial composition of the county, indicated by *proportion Black*, *proportion Hispanic*, and *proportion other races*. Other races include those who reported races other than Black or White, as well as those reporting two or more races. Because the U.S. Census counts

“Hispanic” as an ethnicity, rather than a race, this category may overlap with Black and other races. That is, respondents can report being both Hispanic and Black, for example. As a result, the race categories may sum to more than 100% in each county. Analyses omit the percent non-Hispanic white, and as a result this category serves as the reference group to which the others are compared.

Table 3: Demographic Measures

	N	Minimum	Maximum	Mean	Std. Dev.
Proportion male	2838	0.426	0.673	0.495	0.019
Proportion aged 15-29	2838	0.104	0.528	0.193	0.041
Proportion Black	2838	0.000	0.846	0.091	0.147
Proportion Hispanic	2838	0.001	0.975	0.066	0.124
Proportion other races	2838	0.003	0.954	0.067	0.090
Proportion non-Hispanic white	2838	0.020	0.995	0.809	0.188

I also tested a dummy variable for counties located in the South (46% of counties). Southern counties have significantly higher property and violent crime rates than non-Southern counties; however, after controlling for other demographic characteristics, this relationship disappears. As a result, I do not include an indicator of location in the South in my analyses.

Structural Antecedents of Social Disorganization:

My explanatory variables are also taken from the 2000 U.S. Census, and are derived from social disorganization theory. It is posited that the structural characteristics of a place will increase its level of disorganization, which in turn leads to increases in crime (Shaw and McKay 1942). Thus, I focus first on these structural antecedents of social disorganization: racial and ethnic heterogeneity, economic disadvantage, residential instability, and family disruption, using

indicators similar to those included in prior research (e.g. Osgood and Chambers 2000; Sampson and Groves 1989). Descriptive statistics are presented in Table 4, below.

Ethnic heterogeneity is measured as the proportion of white compared to non-white residents in a county. I calculated the index of diversity: $1 - (\sum p_i^2)$, in which p_i is the proportion of residents of each ethnic group (white or non-white), squared and summed. This measures the probability that two randomly selected individuals in a county would be of different races (white or non-white). Thus a county with only white or only non-white residents would receive a score of 0, while a county with equal numbers of white and non-white residents would receive a score of .5, the maximum.

I measure *economic disadvantage* as the proportion of persons living below the poverty level in 1999. In preliminary analyses I examined additional indicators of economic disadvantage, including unemployment and the percentage of families living below the poverty level. Because these measures were highly correlated, I elected to use poverty as it is a stronger predictor of violent and property crime, and is consistent with prior research on social disorganization.

I include two indicators of *residential instability*; the proportion of homes that are not owner occupied (i.e. renters) and the proportion of residents who moved in the previous five years. The former measure focuses on residents who may be less invested in a community, while the latter measures actual turnover. Lastly, *family disruption* is measured by the proportion of female-headed households in a county.

Table 4: Structural Antecedents of Social Disorganization

	N	Minimum	Maximum	Mean	Std. Dev.
<i>Racial/Ethnic Heterogeneity</i>					
Ethnic heterogeneity	2838	0.010	0.500	0.215	0.158
<i>Economic disadvantage</i>					
Proportion below poverty level in 1999	2838	0.000	0.569	0.140	0.063
<i>Residential Instability</i>					
Proportion moved in past 5 years	2838	0.194	0.846	0.414	0.075
Proportion homes not owner occupied	2838	0.101	0.804	0.261	0.077
<i>Family Disruption</i>					
Proportion female-headed households	2838	0.019	0.364	0.105	0.041

Measures of Community Social Organization:

In addition to structural antecedents of social disorganization, I also examine the effect of more direct measures of community social organization. These county level measures come from a variety of sources, and descriptive statistics are shown in Table 5.

First is a measure of *community associations and organizations*; if there are a greater number of organizations per capita, then there are greater opportunities for involvement in the community, which I expect to increase community organization. To measure this, I use an indicator of the number of civic and social organizations per 1000 population, taken from the U.S. Census County Business Patterns. This includes religious, social, civic, business and political organizations. In preliminary analyses I looked at these different types of organizations separately; results were consistent across all measures. In addition, I also explored per capita measures of the numbers of employees and payroll for civic and social organizations, as well as similar measures for registered nonprofit organizations (data from the National Center for Charitable Statistics). Again, all these indicators of community associations showed similar patterns, but results were the most clear and consistent for the measure of the number of civic and social organizations per 1000 population, so it is used in the analyses shown here.

Religious participation is another form of civic or community engagement that may predict greater community organization, and researchers have noted its importance for predicting violent crime in rural areas (Lee 2008; Lee and Bartkowski 2004a, 2004b). I include two measures of *religious involvement*: the number of churches per 1000 population and the number of adherents of civically engaged religions per 1000 population. Both variables come from the Religious Congregations and Membership Study, 2000 (thearda.com). For the latter measure, civically engaged religions are calculated following Tolbert, Lyson, and Irwin's (1998) example. Respondents to the General Social Survey (GSS) report on both group memberships and associations and religious affiliation. Data from 1990-1994 (data on both questions was not available from 1995-2000) provides a sample of 3474 respondents who report an average of 1.8 group memberships. I identify as civically engaged any religious denomination whose adherents report a greater than average number of group memberships (more than 1.8).¹

I also include several measures of *voting behavior* from the presidential election in 2000 as additional indicators of civic engagement and community. These data come from Dave Leip's Atlas of US Presidential Elections (uselectionatlas.org) and are compiled from various state agencies. The first measure is the margin of victory of the winning candidate in a county. When a candidate takes the county by a wider margin, this indicates more consensus or agreement among residents, which may facilitate a greater sense of community. I use voter turnout as another indicator of civic involvement. This is measured by the proportion of voting aged citizens who voted in the presidential election. Higher levels of voter turnout represent greater civic engagement in a community, which may contribute to the overall level of social

¹ Civically engaged religious denominations include: Catholic, Episcopal, Jewish, Lutheran (except Wisconsin Evangelical Lutheran Synod), Presbyterian, and United Methodist. African Methodist Episcopal Zion and National Baptist Convention were also identified as civically engaged, but data on these was not available in the Religious Congregations and Membership Study in 2000.

organization. Also, though social conservatism is reported to lower crime rates, in preliminary analyses, I did not find a consistent relationship between crime and political conservatism (votes for Republican candidate), so I did not include measures of which candidate won in a county or the proportion of votes for each candidate in the models presented here.

Table 5: Measures of Community Social Organization

	N	Minimum	Maximum	Mean	Std. Dev.
<i>Associations/organizations</i>					
Number of civic/social organizations per 1000 population	2838	0.000	5.487	1.323	0.609
<i>Religious involvement</i>					
Number of churches per 1000 population	2837	0.269	9.877	2.144	1.295
Adherence rate of civically engaged churches, per 1000	2837	0.000	1283.61	278.37	204.44
<i>Voting behavior (presidential election)</i>					
Margin of victory of winning candidate	2838	0.000	0.856	0.237	0.171
Turnout of voting age citizens	2837	0.118	0.982	0.547	0.092

I test for multicollinearity among my explanatory variables. I first examine each group of measures separately (demographics, structural indicators, community variables), and in this case collinearity is not problematic. The five demographic variables all have variance inflation factors (VIF) less than 1.55. Each of the structural measures has a VIF less than 2.85, and the community measures have VIFs under 1.35. When I combine all of the explanatory measures, I find that there are collinearity issues between the measures of proportion Black and female-headed households, with VIFs of 13.71 and 10.72, respectively. If I remove the proportion Black from the model, the VIF for female headed households drops to 5.44 and those of the other variables are all under 3.86. However, I believe it is important to fully account for racial differences between rural and urban places, as well as to attempt to tease apart the effects of race from those of correlated measures like female-headed households. As such, I leave the measure of proportion Black in my models, and take the collinearity issues into account when interpreting my findings.

Analysis

Counties are nested within states, which each have their own sets of laws and enforcement agencies. It is plausible that counties are more similar to other counties within the same state than to counties in other states. As this violates the assumptions of ordinary least squares regression, it is more appropriate to use a method that accounts for this dependence. Thus, I use hierarchical linear modeling (HLM) for my analyses.

Also, analyzing crime rates presents an additional concern. Because crime is relatively rare, among smaller populations there may be very few incidents; this means that estimates of crime in smaller places will be less precise than estimates for larger places (Osgood 2000). Poisson regression models are appropriate for estimating counts of rare events; however, I am interested in crime rates as opposed to crime counts. By including the log of the county population, with a fixed coefficient of one, the Poisson model of crime counts becomes an analysis of crime rates (Lee, Maume, and Ousey 2003; Osgood 2000). It is important to keep in mind that these models predict the number of crimes *per person*. To calculate traditional crime rates (number of crimes per 100,000 population), predicted values from the models should be multiplied by 100,000.

I begin my analysis by comparing crime rates across rural/urban locations. I estimate models that include only the measures of rural/urban location. Separate models are estimated for each crime outcome, with each of the measures of rurality. This allows me to sort out the important aspects of rural/urban location, which guides my choice of the appropriate measures to use for subsequent analyses. Once I identify the most useful measures of rural/urban location, I add the demographic measures, looking at how these are related to property and violent crime, as well as how their addition changes the effects of rural/urban location.

To these base models with the measures of rurality and demographic variables, I then add my explanatory variables, in order to test to what extent social disorganization theory accounts for rural/urban differences in county crime rates. I include the block of structural measures and the block of community measures separately, so that I may compare how the structural antecedents and community measures of social disorganization each affect property and violent crime. I also compare how each set of variables impacts the effects of the rural/urban variables. Next, I include the structural and community indicators together to see to what extent the effects of the structural antecedents are reduced by the inclusion of the community measures. Lastly, I test whether the effects of social disorganization vary in rural and urban places, by including interactions of each predictor with my measures of rural/urban location.

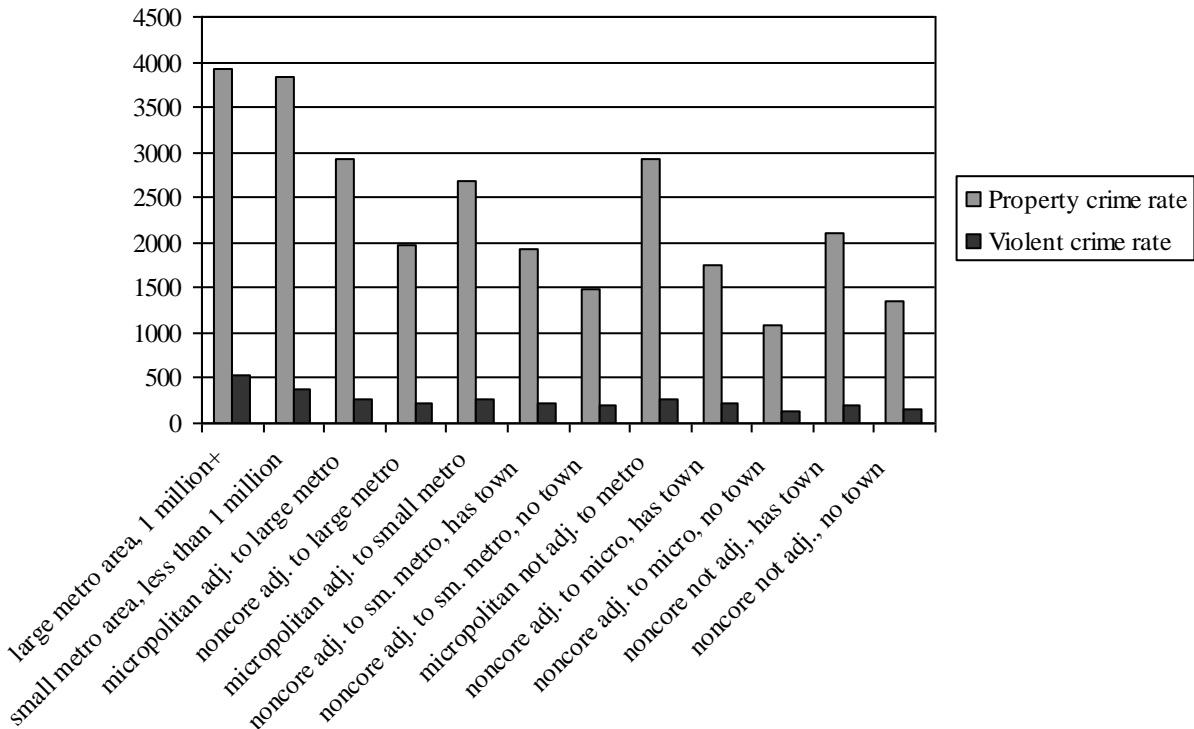
CHAPTER 4 RURAL/URBAN DIFFERENCES IN CRIME RATES

I begin my analyses of rural and urban crime rates by examining several measures of rurality and urbanicity. This allows me to identify the aspects of rural/urban location that are most relevant to crime, in the sense that they account for the most variation in property and violent crime rates across counties. Based on prior research, I expect that more urbanized counties will have higher crime rates than more rural counties. Measures of rural/urban location include the categorical coding schemes of the Urban Influence and Rural Urban Continuum Codes, the less complex distinctions between metropolitan, micropolitan and non-metropolitan counties, the dichotomy between counties adjacent and non-adjacent to metro counties, as well as the continuous measures of population size, density and the percent of a county that is urban.

I treat each of the categories of the Urban Influence Code as dummy variables and use them to predict county property and violent crime rates. I then calculate crime rates by county type, shown in Figure 1 below. The first two categories are metropolitan counties, while the remaining 10 groups are non-metropolitan. The metropolitan counties clearly have higher rates of both property and violent crime than non-metro counties, but there is substantial variation in crime rates among the non-metro counties. The non-metro categories vary on the size of the population and whether the county is adjacent to a metropolitan or micropolitan area. The three categories of non-metro counties that contain a micropolitan area have higher property and violent crime rates than the other non-metro counties. These three categories vary on the adjacency of the county; one group includes micropolitan counties that are adjacent to large metro areas, the next are micropolitan areas adjacent to small metro areas, and the last are not adjacent to metro counties. Surprisingly, these three groups of counties have similar crime rates.

Thus adjacency does not appear to be related to the crime rate of a county. The other non-metro counties (referred to as non-core) have the lowest crime rates. Counties that have a town of at least 2,500 residents have slightly higher crime rates than counties with no town, but again, adjacency does not appear to be related to crime rates.

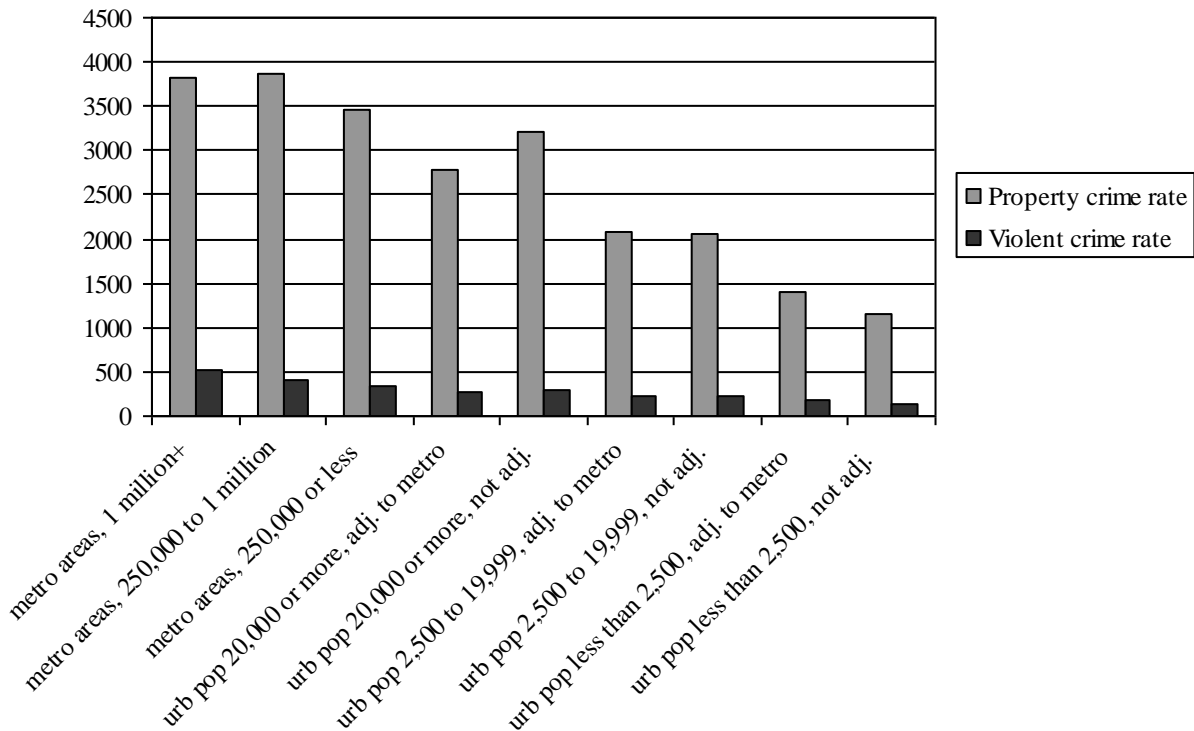
Figure 1: Crime Rates by Urban Influence Codes



I conduct a similar analysis for the Rural Urban Continuum codes and calculate property and violent crime rates (shown in Figure 2 below). The findings are consistent with those from the Urban Influence codes. Metropolitan counties (the first three categories) have the highest rates of both property and violent crime. Crime rates decrease with the size of the urban population in non-metro counties. Again, adjacency to metropolitan counties is not associated with higher crime. In fact, among non-metro counties with urban populations of at least 20,000

people, adjacency to metropolitan counties may actually correspond with lower property crime rates.

Figure 2: Crime Rates By Rural Urban Continuum Codes

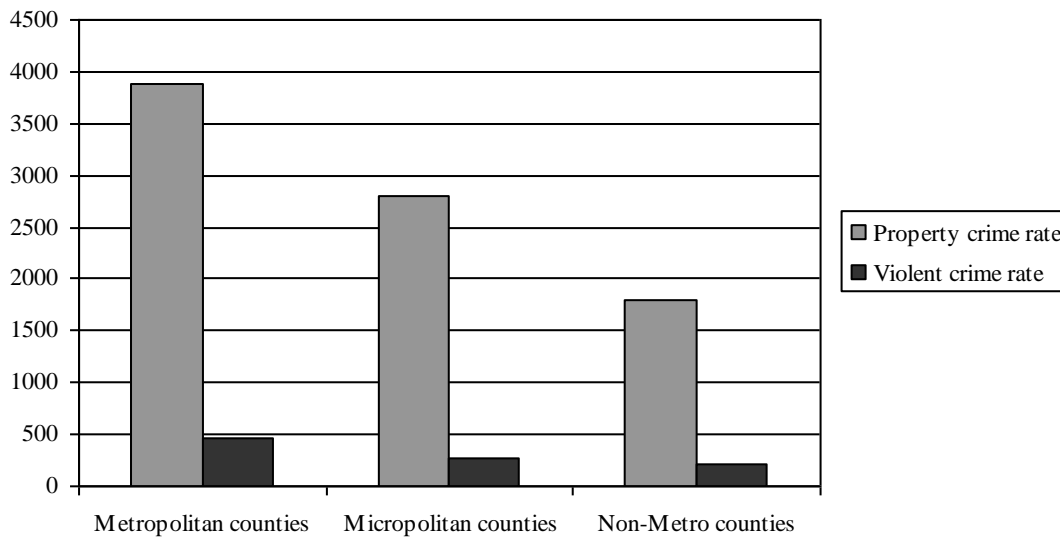


Because the classification schemes of the Urban Influence and Rural Urban Continuum codes are fairly complex, I attempt to separate and identify the most important components. I first compare metro and non-metro counties, and find that metropolitan counties have crime rates that are significantly and substantially higher than non-metro counties. On average, property crime rates are 61% higher and violent crime rates are 84% higher in metropolitan counties than in non-metro counties.

The Urban Influence and Rural Urban Continuum codes identify more variation in crime rates than is explained by a simple metro/non-metro dichotomy, so I further separate the non-

metro counties into those that contain a micropolitan and those that do not (referred to as micropolitan and non-metro, respectively). Micropolitan counties have crime rates that are significantly higher than non-metro areas, but lower than metropolitan places, a pattern that holds for both property and violent crime (see Figure 3).

Figure 3: Crime Rates for Metropolitan, Micropolitan and Non-Metro Counties



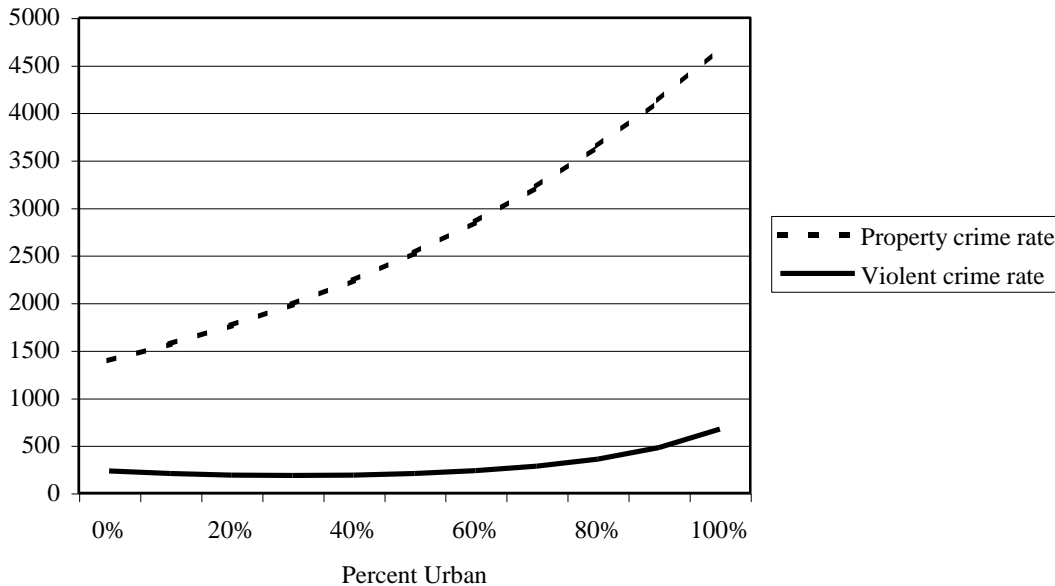
For property crime, this three-category measure accounts for almost all of the variation explained by the Urban Influence or Rural Urban Continuum codes. For violent crime, there is also a small but significant difference in crime rates between large (greater than 1 million population) and small (less than 1 million population) metropolitan counties. In addition, I estimate separate models for each property crime (burglary, larceny, and motor vehicle theft) and each violent crime (robbery, aggravated assault, and homicide). I find that all of these crimes follow the same pattern of highest crime rates in metropolitan counties and lowest in non-metro counties, with micropolitan places falling in between. Rates of motor vehicle theft and robbery

are also significantly higher in large as compared to small metropolitan counties; this distinction is not important for the other crime types.

Next, I test the measures of adjacency. I model adjacency to metropolitan counties, as well as adjacency to either metropolitan or micropolitan areas and I find that none of these measures are important for either violent or property crime. This is contrary to my original expectations that rural areas that are adjacent to metropolitan areas would be more urbanized and thus have higher crime rates. However, counties that surround metropolitan counties and are tied to them through commuting patterns are also classed as metropolitan, even if they are not particularly urbanized, as they are considered to be part of the “metro area.” As a result, counties classified as adjacent to metropolitan areas may in fact be adjacent to surrounding counties rather than to a core population center, and thus not particularly different from other non-metro counties.

Both metropolitan and non-metro counties can vary widely in their urbanicity, as this term is used by the U.S. Census. I therefore also explore the impact on crime rates of the proportion urban in a county, that is, the proportion of residents living in areas with a population of at least 2,500. I test both a linear term, which is significantly and positively related to both violent and property crime, as well as a quadratic term, which is significant for violent crime (but included in models of both crime types). These relationships can be seen in Figure 4 below. Property crime rates increase substantially as the proportion of urban population of a county increases. Violent crime also increases with urbanicity, particularly among the most urban counties.

Figure 4: Crime Rates by Percent Urban



The proportion urban accounts for a substantial proportion of the variation in property and violent crime rates; the linear and quadratic terms explain close to 36% of the variation in each crime type. The three category measure of metropolitan character (metropolitan, micropolitan, non-metro) accounts for only 17% of the variation in property crime rates and 9% of the variation in violent crime rates. Though there is substantial overlap in the metropolitan character and percent urban, these tap into two different facets of rurality, and so I include both in these analyses.

For property crime, the differences between non-metropolitan, micropolitan, and metropolitan counties are reduced when percent urban is added to the model, but coefficients for both dummy variables remain significant (see model 1 in Table 6). The effect of proportion urban is also reduced slightly, and the quadratic term remains non-significant. On the other hand, including percent urban substantially reduces the differences in violent crime rates between non-

metropolitan, micropolitan, and metropolitan counties.² The linear and quadratic terms for proportion urban remain significant and positive, but the difference between micropolitan and non-metro crime rates becomes non-significant (see model 2 in Table 6). Furthermore, after controlling for proportion urban, metropolitan counties actually have non-significantly lower crime rates than non-metro counties; however, because most metropolitan counties have a proportionally more urban population, they still average higher net crime rates than non-metro places.

Table 6: Predicting Crime Rates

	Model 1: Property Crime			Model 2: Violent Crime		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-3.882 ***	0.052	0.021	-6.017 ***	0.097	0.002
<u>Measures of Rurality</u>						
Micropolitan	0.169 **	0.042	1.184	0.131	0.062	1.139
Metropolitan	0.138 ***	0.049	1.148	-0.058 *	0.072	0.944
Proportion Urban	1.069 ***	0.127	2.914	0.663 ***	0.152	1.941
Proportion Urban ²	0.227	0.286	1.255	2.757 ***	0.381	15.749
	[R ² =0.357]			[R ² =0.374]		

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

Lastly, I test measures of population size and density. To make the models an analysis of crime rates, the log of the population is included with a fixed coefficient of one. In order to test the effect of population size on crime, I simply allow the coefficient of the logged measure to vary, and calculate whether it differs significantly from a value of one (rather than zero). When population size and density are used as sole predictors of violent and property crime rates, each

² In addition, controlling for the percent of the urban population in a county completely eliminates the difference in crime rates between large and small metro areas, so those measures are not included in subsequent analyses

was significant associated with crime, in the expected direction. That is, as population size or density increased, so did property and violent crime rates.

Though both population density and size are significant predictors of crime, I also test whether they add any additional explanatory value to the models with the categorical measure of metropolitan character and the linear and quadratic terms for percent urban. When added to these models, the effects of both population size and density are reduced substantially. Population density is still significantly related to both property and violent crime, but the effects are very small and do not meaningfully improve the model. When added with the other measures of rural/urban location, the effect of population size on property crime becomes non-significant. The effect on violent crime is much reduced and, though significant, explains little additional variance in crime rates.

With the exception of adjacency, which was not related to crime rates, these analyses confirm my hypotheses about rurality and crime; metropolitan location, percent urban, population size and population density are all positively related to both property and violent crime rates. However, when included together, percent urban (linear and quadratic) and a categorical measure of metropolitan, micropolitan or non-metro location proved to be the best predictors of violent and property crime rates. As a result, these measures (shown in Table 6) are used as the base model for all of the following analyses.

CHAPTER 5
EXPLAINING RURAL/URBAN DIFFERENCES IN CRIME RATES

I identify clear differences in crime rates across rural and urban counties. Though scholars have offered a variety of explanations for these differing crime rates, they remain largely untested. In these analyses, I examine to what extent demographic characteristics and measures of social disorganization theory account for differences in crime rates across rural and urban locations. As part of my test of social disorganization theory, I compare the effects of structural antecedents of disorganization with measures of community social organization.

Demographic measures:

Prior research has shown that the demographic characteristics of a population are related to crime rates. Simple bivariate correlations confirm that this is true for this sample as well. The proportions of the county population that are Black, Hispanic, or of other races are all positively related to property and violent crime rates; however, though the correlations are significant, they are all fairly small. The proportion of the population aged 15 to 29 is also positively correlated with violent and property crime rates, while the proportion of the population that is male is actually negatively correlated with crime rates.

Table 7: Rural/Urban Differences on Demographic Measures

	<i>Metropolitan counties</i>		<i>Micropolitan counties</i>		<i>Non-metro counties</i>	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Proportion male	0.493	0.015	0.495	0.018	0.498	0.022
Proportion aged 15-29	0.203	0.044	0.205	0.047	0.179	0.030
Proportion Black	0.110	0.139	0.091	0.149	0.076	0.150
Proportion Hispanic	0.067	0.111	0.073	0.140	0.061	0.125
Proportion other races	0.069	0.076	0.066	0.082	0.065	0.103
N	1022		609		1207	

To the extent that these demographic characteristics are also correlated with rural/urban location, they may help to account for the differences in crime rates by location. In Table 7, I present descriptive statistics for the demographic measures, for metropolitan, micropolitan, and non-metro counties. Non-metro counties have the lowest proportions of minorities and persons aged 15 to 29, as well as a slightly larger proportion of male residents, while metropolitan and micropolitan counties have fairly similar demographic characteristics. In addition the proportion of the county population that is urban is positively correlated with the proportion aged 15-29 (see Table 8). Thus, it is feasible that demographic characteristics may help to account for differences in crime rates across rural and urban location.

Table 8: Bivariate Correlations with Demographic Measures

	Property crime rate	Violent crime rate	Percent urban
Proportion male	-0.159***	-0.135***	-0.143***
Proportion aged 15-29	0.306***	0.177***	0.401***
Proportion Black	0.277***	0.43***	0.096***
Proportion Hispanic	0.131***	0.152***	0.236***
Proportion other races	0.132***	0.163***	0.193***

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

Predicting crime: To test whether demographic measures predict county crime rates, I add these variables to the base models with the measures of rurality; Tables 16 and 17 show the results for property and violent crime rates, respectively (see model 1). The results are fairly consistent across both types of crime, though the measures of minority population are stronger predictors of violent crime. A standard deviation increase in proportion Black is associated with a 44% increase in violent crime rates, but only 18% for property crime rates. The Hispanic population has a much smaller effect; violent and property crime rates increase by 5.5% and 3.4%, respectively, in response to a one standard deviation increase in the percent Hispanic. The

effect of the size of the population of other races is much less consistent; increases in this proportion correspond to an increase in violent crime rates but a decrease for property crime rates.

The age composition is also significantly related to crime rates; a one standard deviation increase in the proportion of the population aged 15 to 29 (the age group most likely to commit crime) corresponds to an approximately 8% increase in both the property and violent crime rates in a county. Proportion male is negatively related to crime rates. A one standard deviation increase in the proportion of a county population that is male (about 2%; see Table 3 for descriptive statistics) is associated with an 8% decrease in a county's property crime rate and a 12% decrease in the violent crime rate. This finding is somewhat surprising, as on average, males commit more crimes than females, and so a population with a larger proportion of male residents would be expected to have a higher crime rate. I speculate that this measure may actually be reflecting some other county characteristic, such as a higher percentage of single mothers.

Explaining the effects of measures of rurality: To see how the inclusion of these demographic characteristics affect the relationship of rurality to crime, I compare these models with the base models in Table 6 that include only the categorical measures of metropolitan character and the measures of proportion urban. For property crime, I compare the coefficients from model 1 in Table 6 with those from model 1 in Table 16. Interestingly, though the effect of the proportion of the population in urban places is reduced, the coefficient of the "metropolitan" variable actually increases, reflecting a larger difference between metropolitan and non-metropolitan counties after controlling for these demographic variables than before. Similarly, for violent crime, including the demographic variables increases the coefficient for metropolitan, while decreasing the linear and quadratic terms for proportion urban.

To get a more complete picture of the rural/urban differences in crime rates, I calculate fitted property and violent crime rates that take into account county type (metropolitan, micropolitan, or non-metro) as well as proportion urban. On average, metropolitan counties tend to have the highest proportion of urban residents and non-metro counties the lowest, so I calculate crime rates for each county category, assuming the median percentage of urban residents for that type of county. Thus, I fit property and violent crime rates for a metropolitan county that is 67.6% urban, a micropolitan county with a 50.6% urban population, and a non-metro county that is only 18.7% urban. I compare fitted crime rates from the base models that include only measures of rurality (shown in Table 6) with the models that control for the demographic characteristics of a county (held constant at their means). This allows me to identify to what extent the demographic characteristics of a county account for differences in crime rates between rural and urban counties.

Table 9: Fitted Crime Rates by County Type

	Property crime rates		Violent crime rates	
	Base model (no controls)	Model w/ dem. controls	Base model (no controls)	Model w/ dem. controls
Metropolitan (67.6% urban)	3121.69	3164.56	254.68	274.31
Micropolitan (50.6% urban)	2645.84	2667.61	232.11	235.34
Non-metro (18.7% urban)	1603.97	1691.50	184.91	185.31
Metro - Non-metro crime rate	1517.72	1473.06	69.78	89.01

The fitted values shown in Table 9, above, suggest that controlling for demographic characteristics does not substantially reduce the difference in crime rates between urban and rural places. For property crime, the difference in crime rates between metropolitan and non-metro counties decreases slightly when demographic characteristics are controlled. Yet for violent crime, there is actually an increase in the difference in crime rates. When including only

measures of rurality, a metropolitan county with the median percent urban experiences about 70 more crimes per 100,000 people than a non-metro county, but after controlling for demographic measures, this gap in the violent crime rate jumps to 89.

These fitted crime rates compare “typical” metropolitan, micropolitan, and non-metro counties (with the median percent urban population for each county type), yet these three county types range across the full spectrum of urbanicity, from no urban residents to all residents living in urban areas³. Thus, I graph crime rates for metropolitan and non-metro counties across all levels of urbanicity; micropolitan counties fall in between the two, so I exclude them from the graphs for simplicity. In the figures below, the solid lines represent fitted crime rates from models without demographic controls, while the dotted lines are calculated holding the demographic measures constant at their means. These figures show that though the differences between “typical” metropolitan, micropolitan, and non-metro counties are not much changed, controlling for demographic measures does reduce the effect of location on crime, particularly for counties with a higher proportion of urban residents. However, there is still a significant and substantial effect of rural/urban location on both property and violent crime that is not accounted for by these measures.

³ Metropolitan counties with no urban residents are typically “commuter” counties, or surrounding counties that are part of a larger metro area but are not actually part of the city.

Figure 5: Fitted Property Crime Rates: With and Without Demographic Controls

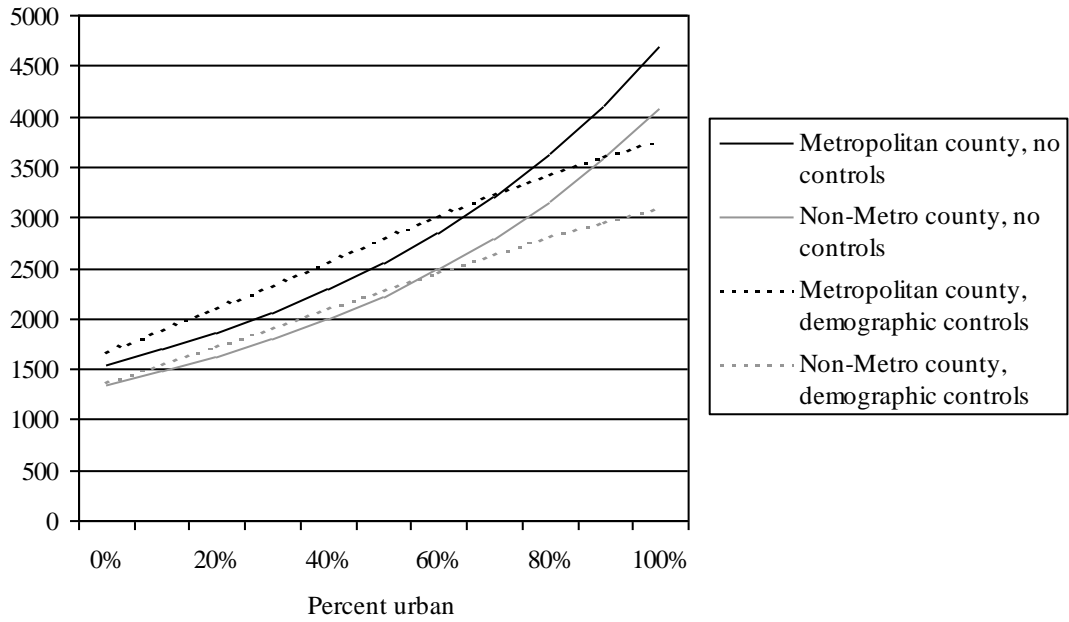
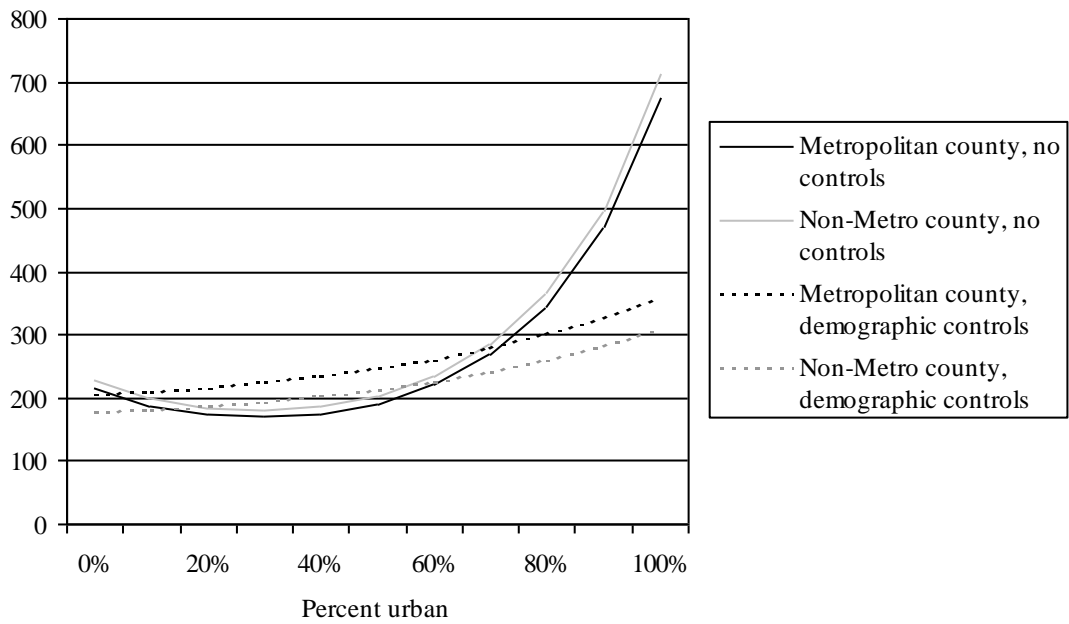


Figure 6: Fitted Violent Crime Rates: With and Without Demographic Controls



Structural antecedents of social disorganization:

According to social disorganization theory, ethnic heterogeneity, economic disadvantage, residential instability, and family disruption increase the level of disorganization in a neighborhood, which in turn increases crime rates. For U.S. counties in 2000, I find that these characteristics are positively correlated with property and violent crime rates (with one exception: there is no significant correlation between property crime and poverty rates).

Crime rates are higher in more urban places, and if these structural indicators of disorganization are also associated with urban location, these measures may help to account for rural/urban differences in crime rates. Bivariate correlations between measures of disorganization and the proportion of a county's population that is urban confirm that ethnic heterogeneity, residential instability, and family disruption are all positively correlated with urbanicity. The poverty rate, however, is negatively correlated with the proportion urban, indicating that more rural places suffer from higher rates of poverty.

Table 10: Bivariate Correlations with Structural Antecedents of Disorganization

	Property crime rate	Violent crime rate	Percent urban
<i>Racial/Ethnic Heterogeneity</i>			
Ethnic heterogeneity	0.395***	0.504***	0.289***
<i>Economic disadvantage</i>			
Proportion below poverty level in 1999	0.034	0.258***	-0.152***
<i>Residential Instability</i>			
Proportion moved in past 5 years	0.480***	0.216***	0.543***
Proportion homes not owner occupied	0.466***	0.337***	0.559***
<i>Family Disruption</i>			
Proportion female-headed households	0.379***	0.507***	0.262***

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

I also separate metropolitan, micropolitan, and non-metro counties and calculate the mean level of each structural indicator of disorganization for each county type (see Table 11

below). These results show patterns consistent with those found for proportion urban. On average, metropolitan counties have the highest level of ethnic heterogeneity and the largest proportion of residents who moved in the past five years, homes that are not owner-occupied, and female headed households, while non-metro counties have the lowest levels of all of these. Economic disadvantage follows the opposite pattern; on average, the poverty rate is highest in non-metro counties and lowest in metropolitan counties. Thus, with the exception of poverty, it is possible that structural antecedents of disorganization could help account for rural/urban differences in violent and property crime rates.

Table 11: Rural/Urban Differences in Structural Antecedents of Disorganization

	<i>Metropolitan counties</i>		<i>Micropolitan counties</i>		<i>Non-metro counties</i>	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<i>Racial/Ethnic Heterogeneity</i>						
Ethnic heterogeneity	0.248	0.151	0.215	0.155	0.186	0.161
<i>Economic disadvantage</i>						
Proportion below poverty level in 1999	0.117	0.054	0.145	0.061	0.157	0.066
<i>Residential Instability</i>						
Proportion moved in past 5 years	0.446	0.075	0.426	0.071	0.380	0.061
Proportion homes not owner occupied	0.279	0.097	0.276	0.067	0.239	0.055
<i>Family Disruption</i>						
Proportion female-headed households	0.113	0.034	0.109	0.040	0.096	0.045
N	1022		609		1207	

Predicting crime: To test how structural antecedents of social disorganization are related to crime and to what extent they explain rural/urban differences, I add them to models that include both measures of rurality and demographic characteristics. Model 2 in Table 16 shows the results for property crime rates, while Table 17 presents those predicting violent crime (model 2). For both property and violent crime, increases in structural indicators of social

disorganization are associated with increases in a county's crime rate, though two predictors of violent crime are not statistically significant.

All five structural measures included in the model are significantly associated with property crime rates. Ethnic heterogeneity and family disruption (female-headed households) are the two strongest predictors. Controlling for demographic and structural characteristics of a county, a one standard deviation increase in female-headed households—an increase of about 4%—corresponds to a 24% increase in a county's property crime rate. A one standard deviation increase in ethnic heterogeneity (0.16) is associated with a 21% increase in the crime rate.

Though the two measures of residential instability both have significant effects, the proportion of residents who moved in the past 5 years has a stronger effect on property crime rates, net of demographic and structural measures. An increase of about 8% (one standard deviation) coincides with an increase in a county's property crime rate of nearly 15%, while a similar increase in the proportion of homes that are not owner occupied is associated with a 6% increase in the crime rate. The poverty rate has a similarly small effect; a standard deviation increase in the poverty rate of a county (6%) increases the property crime rate by just over 6%.

Including the measures of ethnic heterogeneity, economic disadvantage, residential instability, and family disruption substantially changes the effects of the demographic measures. Without controls for structural indicators of social disorganization, the proportion Black or Hispanic was positively and significantly related to property crime rates. However, controlling for these measures of social disorganization reduces the effect of the Hispanic population to non-significance and reverses the effect of the Black population; net of these structural measures of disorganization, the proportion Black is negatively related to a county's crime rate. Furthermore,

adding these antecedents of disorganization reduces the effects of gender and age composition on property crime rates.

Though similar, the results for violent crime rates differ slightly from those for property crime. All of the effects are in the same direction but differ in magnitude and some effects are not statistically significant. The strongest predictor of violent crime rates is a county's level of ethnic heterogeneity; controlling for demographic and structural characteristics, a one standard deviation increase in ethnic heterogeneity coincides with a 42% increase in a county's violent crime rate, which is much greater than the effect on property crime. The poverty rate also has a larger effect on violent crime than on property crime; a 6% increase in poverty is associated with an 18.5% increase in violent crime.

Of the two measures of residential instability, only the proportion of homes that are not owner occupied has a significant effect on violent crime, with a one standard deviation increase corresponding to violent crime rates that are 15% higher. The effect of the proportion of residents who moved is fairly small and not statistically significant. Family disruption also has a stronger effect on property crime; for violent crime, a 4% increase in the percent of female-headed households is associated with a 14% increase in crime rates, but this relationship does not quite attain statistical significance.

Controlling for these structural measures of social disorganization changes the relationships between violent crime and the demographic characteristics of a county. When modeled alone, the minority population (proportions Black, Hispanic, and other races) was significantly and positively related to violent crime. When controls for the structural characteristics are added to the model, the measures of the minority population become

negatively related to violent crime, though only the effect of the proportion Hispanic is statistically significant.

Explaining the effects of measures of rurality: I hypothesize that the relationship between rurality and crime rates will be partially explained by social disorganization theory. That is, urban places have higher levels of social disorganization, and so when these measures are controlled, the relationship between rurality and crime will be reduced. I first examine the effects of structural antecedents of social disorganization, and find that these measures are in fact associated with both crime and rurality, and thus may help to account for the relationship between rurality and crime.

To test this, I compare the effects of my measures of rurality from the model that includes these structural indicators of disorganization with those from a model that does not include these measures. For property crime, these are shown in Table 16; in addition to measures of rurality, model 1 includes only demographic measures, while model 2 also includes structural measures of disorganization. Comparable models for violent crime are presented in Table 17.

For property crime, including structural antecedents of disorganization did not substantially change the effects of the county type; the differences between metropolitan, micropolitan, and non-metro counties remain almost the same. The effect of proportion urban, however, is substantially reduced when structural measures of social disorganization are included in the model. Controlling for structural indicators and demographic characteristics, increasing the percent urban from 18.7% (the median for non-metro counties) to 67.6% (the median for metropolitan counties) coincides with a 34% increase in the property crime rate. When measures of social disorganization are not included, a similar increase in the percent urban results in a 53% increase in property crime.

Table 12, below, shows fitted values for metropolitan, micropolitan and non-metro counties with median urban populations (for each county type). For property crime, controlling for structural measures of social disorganization reduces the gap between typical metropolitan and non-metro counties. For violent crime, on the other hand, the differences in crime rates between metropolitan, micropolitan, and non-metro counties with average urban populations are not reduced when structural indicators of disorganization are added to the model.

Table 12: Fitted Crime Rates by County Type, Structural Antecedents

	Property crime rates		Violent crime rates	
	Model w/ only dem. controls	Model w/ structural measures	Model w/ only dem. controls	Model w/ structural measures
Metropolitan (67.6% urban)	3164.56	2839.44	274.31	274.06
Micropolitan (50.6% urban)	2667.61	2516.20	235.34	227.65
Non-metro (18.7% urban)	1691.50	1757.36	185.31	178.56
Metro - Non-metro crime rate	1473.06	1082.08	89.01	95.50

Controlling for structural antecedents of disorganization does reduce the effect of percent urban on violent crime. For the model without such controls (model 1 in Table 17), increasing the percent urban from 18.7% to 67.6% (the median percent urban for non-metro and metropolitan counties) is associated with a 27.6% increase in a county's violent crime rate but when structural indicators are added to the model (model 2), a similar increase in the percent urban increases violent crime by only 16.4%. However, this effect is essentially cancelled out by increases in the differences between metropolitan, micropolitan, and non-metro counties; when structural measures of disorganization are controlled, these effects actually become larger. Without controls for measures of disorganization, metropolitan counties have violent crime rates that are 16% higher than non-metro places, while micropolitan counties have crime rates 11%

higher than their non-metro counterparts. When controls for structural measures of disorganization are added, these differences increase to 32% and 18% respectively.

Overall, structural measures of social disorganization—ethnic heterogeneity, economic disadvantage, residential instability, and family disruption—are significantly and positively related to property and violent crime rates (with the exception of the proportion moved and the proportion of female-headed households, which are not significant predictors of violent crime). In addition, for both property and violent crime, controlling for these structural indicators reduces the effects of the demographic characteristics of a county, particularly the racial composition.

I hypothesized that controlling for structural measures of social disorganization would reduce urban/rural differences in crime rates. My findings confirm this hypothesis for property crime, as these measures reduce the effect of the proportion urban. For violent crime, though controlling for disorganization reduces the effect of proportion urban, it increases the effect of county type (metropolitan, micropolitan, non-metro); overall, the difference in crime rates between urban and rural places is not substantially reduced.

Measures of community social organization

Social disorganization theory suggests that structural measures—ethnic heterogeneity, economic disadvantage, residential instability, and family disruption—increase disorganization which, in turn, increases crime. I examined the effects of structural antecedents in the prior section and in this section I explore the effects of disorganization using a variety of measures of social organization in a community.

As indicators of community social organization, I include measures of the number of civic and social organizations, the level of religious involvement, and voting behavior/civic engagement. I expect that these measures will predict property and violent crime rates. Looking at bivariate correlations, I find that these measures of community organization and engagement are all significantly and negatively correlated with both property and violent crime (see Table 13). That is, counties with higher levels of community organization tend to have lower levels of crime.

It is often assumed that rural residents share a greater sense of community than urban residents (Bell 1992; Fitchen 1991). If rural counties do tend to have higher levels of community social organization, then controlling for these measures may help to account for rural/urban differences in property and violent crime rates. I calculate bivariate correlations between my measures of community organization and the proportion urban in a county, and find that for the most part, these measures are associated with rurality. The number of churches per 1000 residents has a strong negative correlation with the proportion urban; the number of civic organizations per 1000 residents, the margin of victory of the winning candidate in the 2000 presidential election, and the voter turnout rate are also negatively correlated with a county's urban population, though these correlations are fairly small. The exception to this pattern is the adherence rate of civically engaged religions, which is positively correlated with the proportion urban; more urban populations tend to have higher rates of adherence to civically engaged denominations.

Table 13: Bivariate Correlations with Measures of Community Social Organization

	Property crime rate	Violent crime rate	Percent urban
<i>Associations/organizations</i>			
Number of civic/social organizations per 1000	-0.099***	-0.154***	-0.135***
<i>Religious involvement</i>			
Number of churches per 1000 population	-0.492***	-0.275***	-0.664***
Adherence rate of civic churches, per 1000	-0.151***	-0.179***	0.085***
<i>Voting behavior (presidential election)</i>			
Margin of victory of winning candidate	-0.176***	-0.118***	-0.154***
Turnout of voting age citizens	-0.253***	-0.318***	-0.177***

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

In addition to these correlations, I separate metropolitan, micropolitan, and non-metro counties and calculate the mean of my measures of community organization for each county type (see Table 14 below). Non-metro counties have the highest average across all five indicators of organization, while metropolitan counties have the lowest level of all except voter turnout (micropolitan counties have the lowest average turnout rates). These five measures of community social organization are negatively correlated with both property and violent crime, and tend to be more prevalent in more rural locations (non-metro counties, lower percent urban). As such, it is possible that controlling for these measures may help to account for differences in crime rates between urban and rural places.

Table 14: Rural/Urban Differences in Measures of Community Social Organization

	<i>Metropolitan counties</i>		<i>Micropolitan counties</i>		<i>Non-metro counties</i>	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<i>Associations/organizations</i>						
Number of civic/social orgs. per 1000	1.090	0.432	1.338	0.436	1.513	0.731
<i>Religious involvement</i>						
Number of churches per 1000 population	1.280	0.748	1.843	0.780	3.029	1.304
Adherence rate of civic churches, per 1000	262.14	172.95	270.56	190.62	296.08	232.63
<i>Voting behavior (presidential election)</i>						
Margin of victory of winning candidate	0.209	0.147	0.221	0.157	0.270	0.191
Turnout of voting age citizens	0.540	0.085	0.524	0.087	0.565	0.096
N	1022		609		1207	

Predicting crime: To test the effects of these measures of community social organization, I add them to models that include the measures of rurality and demographic characteristics, but not the structural indicators of disorganization—I want to separate the effects of the structural and community measures. Model 3 in Table 16 presents findings for property crime; results for violent crime are shown in model 3 in Table 17.

All of the measures of community social organization are better predictors of property crime rates than of violent crime rates. The measures of religious and civic engagement all had effects in the expected direction. Net of other measures, one standard deviation increases in the number of churches and the adherence rate of civically engaged denominations are associated with decreases in the property crime rate of 19% and 14%, respectively. A 9% increase in voter turnout (one standard deviation) corresponds to a 12% decrease in the rate of property crime incidents. Thus, it is clear that community involvement, as measured by religious and civic engagement, is associated with lower property crime rates.

The margin of victory of the winning presidential candidate in a county, a measure of shared political attitudes, is also associated with lower crime rates. As the margin of victory increases by 17% (one standard deviation), property crime rates decrease by 6%. This demonstrates that shared values are important to a community above and beyond involvement, though involvement does have the larger effect on property crime rates. Surprisingly, the number of civic associations per 1000 population was positively related to property crime rates, net of the other community and demographic measures.⁴ A one standard deviation increase in this measure,

⁴ This measure includes a wide variety of organization types: religious groups, grantmaking and advocacy groups, and civic, business, political and other associations. I looked separately at civic and social organizations, and business and political groups, and found a similar positive effect on crime for both types of organizations. The effect of the number of civic organizations also remained positive and significant when the other community measures were removed from the model.

an increase of .61, is associated with a 17% increase in property crime rates. It may be that this measure includes organizations that don't play a positive role in communities or that the number of civic organizations increases in communities with more problems or detrimental characteristics.

Though the measures of community social organization are all significantly related to property crime rates, this is not the case for rates of violent crime. Only the voter turnout rate is negatively related to violent crime; an increase of one standard deviation of the turnout rate is associated with a decrease of more than 20% of the violent crime rate. Though in the expected direction, the other measures of religious and civic engagement do not significantly predict violent crime rates. The relationship between the number of civic associations and violent crime rates was similar to that for property crime; a standard deviation increase in the number of organizations corresponds to a 15% increase in the violent crime rate.

For both property and violent crime, controlling for these community measures has relatively little impact on the effect on the demographic measures; it slightly reduces the effects of the age and gender composition of a county, as well as the effect of the proportion of the population that is Black. Overall, measures of civic and religious engagement are more important for predicting property crime rates than violent crime, though surprisingly, the number of civic associations per 1000 population was actually associated with higher rates of both types of crime.

Explaining the effects of measures of rurality: I hypothesize that these measures of community social organization will help to account for rural/urban differences in crime rates. I expect that more rural places will have higher levels of community organization, and that these

measures will be predictive of lower crime rates, so controlling for community organization will reduce the relationship between crime and rurality.

To test this, I compare the effects of the measures of rurality from the model that only controls for the demographic characteristics of a county with a model that also includes the community measures; these are models 1 and 3 shown in Table 16 for property crime rates and Table 17 for rates of violent crimes.

For property crime, the effects of all of the measures of rurality are reduced somewhat. Without controls for measures of disorganization, metropolitan counties have property crime rates that are 22% higher than non-metro places, while micropolitan counties have crime rates 17% higher than their non-metro counterparts. When controls for measures of community social organization are added, these differences drop to 10% and 15% respectively. In addition, for the model without measures of disorganization, when the percent urban is increased from 18.7% to 67.6% (the median percent urban for non-metro and metropolitan counties, this corresponds to a 53.3% increase in the property crime rate, but when community measures are added to the model, a similar increase in the percent urban is associated with an increase in the property crime rate of only 37.6%.

Looking at the coefficients for the measures of rurality in the models predicting violent crime rates tells a similar story. The differences in crime rates between metropolitan, micropolitan, and non-metro counties remain much the same, even when measures of community social organization are added to the model. For a model without measures of disorganization, an increase in percent urban, as described above, coincides with a 27.6% increase in violent crime rates. Adding measures of community organization to the model only decreases this slightly; a similar increase in the percent urban increases crime rates by 21.8%

To understand how the effects of county type and the percent urban work together, I calculate fitted crime rates for metropolitan, micropolitan, and non-metro counties with the median percent urban for each county type, holding all other measures constant at their means, presented in Table 15. For property crime, after controlling for measures of community social organization, the difference in crime rates between the typical metropolitan and non-metro county drops from 1473 to 1024 crimes per 100,000 residents. For violent crime, on the other hand, this difference is only reduced from 89 to 82.

Table 15: Fitted Crime Rates by County Type, Community Measures

	Property crime rates		Violent crime rates	
	Model w/ only dem. controls	Model w/ community measures	Model w/ only dem. controls	Model w/ community measures
Metropolitan (67.6% urban)	3164.56	2786.60	274.31	265.51
Micropolitan (50.6% urban)	2667.61	2378.24	235.34	214.62
Non-metro (18.7% urban)	1691.50	1762.41	185.31	183.45
Metro - Non-metro crime rate	1473.06	1024.20	89.01	82.06

I hypothesized that controlling for measures of the social organization in a community would help to account for the urban/rural differences in crime rates. I find that this is the case for property crime; controlling for community organization reduces the effects of the measures of rurality. For violent crime, however, this hypothesis is not supported. Measures of community organization do not account for rural/urban differences in crime rates; in fact, these community measures are largely unrelated to violent crime rates.

Table 16: Predicting Property Crime Rates

	Model 1			Model 2			Model 3			Model 4		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-3.899 ***	0.056	0.020	-3.921 ***	0.052	0.020	-3.888 ***	0.045	0.020	-3.901 ***	0.046	0.020
<u>Measures of Rurality</u>												
Micropolitan	0.153 ***	0.040	1.166	0.153 ***	0.032	1.165	0.097 **	0.032	1.102	0.105 ***	0.029	1.110
Metropolitan	0.199 ***	0.041	1.220	0.191 ***	0.041	1.210	0.139 ***	0.033	1.149	0.134 ***	0.032	1.143
Proportion Urban	0.891 ***	0.102	2.438	0.604 ***	0.104	1.830	0.648 ***	0.080	1.912	0.414 ***	0.101	1.513
Proportion Urban^2	-0.431	0.253	0.650	-0.327	0.199	0.721	0.108	0.202	1.114	0.051	0.177	1.052
<u>Demographic Measures</u>												
Proportion male	-4.497 ***	0.934	0.011	-2.660 ***	0.715	0.070	-5.350 ***	0.728	0.005	-3.141 ***	0.693	0.043
Proportion aged 15-29	1.958 ***	0.307	7.086	-0.857	0.472	0.424	0.697 *	0.318	2.008	-0.632	0.466	0.532
Proportion Black	1.118 ***	0.122	3.060	-1.145 **	0.381	0.318	0.859 ***	0.115	2.362	-0.864 *	0.340	0.421
Proportion Hispanic	0.269 *	0.123	1.309	-0.299	0.219	0.741	0.446 *	0.211	1.561	-0.016	0.236	0.984
Proportion other races	-0.428 *	0.214	0.652	-1.779 ***	0.402	0.169	-0.326	0.287	0.722	-1.295 ***	0.367	0.274
<u>Structural Measures of Social Disorganization</u>												
<i>Racial/ethnic heterogeneity</i>												
Ethnic heterogeneity				1.218 ***	0.266	3.381				0.875 ***	0.199	2.400
<i>Economic disadvantage</i>												
Proportion below poverty level in 1999				0.960 *	0.414	2.611				0.467	0.408	1.595
<i>Residential instability</i>												
Proportion moved in past 5 years				1.831 ***	0.403	6.237				1.314 **	0.456	3.719
Proportion homes not owner occupied				0.758 **	0.261	2.135				0.464	0.292	1.591
<i>Family disruption</i>												
Proportion female-headed households				5.180 ***	0.933	177.746				5.031 ***	0.963	153.028
<u>Measures of Community Social Organization</u>												
<i>Associations/organizations</i>												
Number of civic/social orgs, per 1000							0.261 ***	0.036	1.298	0.245 ***	0.031	1.277
<i>Religious involvement</i>												
Number of churches, per 1000 population							-0.160 ***	0.028	0.852	-0.150 ***	0.032	0.861
Adherence rate of civic churches, per 1000							-0.0007 ***	0.000	0.9993	-0.0005 ***	0.000	0.9995
<i>Voting behavior (presidential election)</i>												
Margin of victory of winning candidate							-0.361 ***	0.099	0.697	-0.276 **	0.096	0.759
Turnout of voting age citizens							-1.432 ***	0.231	0.239	-0.722 ***	0.174	0.486
	[R^2=0.492]			[R^2=0.577]			[R^2=0.586]			[R^2=0.627]		

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

Table 17: Predicting Violent Crime Rates

	Model 1			Model 2			Model 3			Model 4		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-6.164 ***	0.075	0.002	-6.244 ***	0.066	0.002	-6.172 ***	0.067	0.002	-6.225 ***	0.061	0.002
<u>Measures of Rurality</u>												
Micropolitan	0.102	0.061	1.107	0.164 ***	0.046	1.179	0.085	0.055	1.089	0.103 *	0.044	1.108
Metropolitan	0.149 *	0.064	1.161	0.277 ***	0.059	1.319	0.172 **	0.058	1.188	0.203 ***	0.055	1.225
Proportion Urban	0.482 ***	0.097	1.619	0.296 **	0.113	1.344	0.362 **	0.124	1.436	0.162	0.124	1.175
Proportion Urban^2	0.397	0.319	1.487	0.375	0.250	1.454	1.048 ***	0.312	2.852	0.671 *	0.298	1.956
<u>Demographic Measures</u>												
Proportion male	-6.715 ***	1.260	0.001	-1.405	1.084	0.245	-7.191 ***	1.122	0.001	-3.467 ***	1.059	0.031
Proportion aged 15-29	1.815 ***	0.488	6.141	-2.828 **	1.022	0.059	0.133	0.463	1.142	-3.009 ***	0.898	0.049
Proportion Black	2.468 ***	0.252	11.797	-0.422	0.520	0.656	2.157 ***	0.255	8.641	-0.148	0.547	0.863
Proportion Hispanic	0.433 *	0.199	1.542	-0.490 **	0.182	0.613	0.390	0.344	1.477	-0.345 *	0.155	0.708
Proportion other races	1.480 ***	0.318	4.392	-0.811	0.503	0.445	1.384 ***	0.326	3.990	-0.595	0.498	0.551
<u>Structural Measures of Social Disorganization</u>												
<i>Racial/ethnic heterogeneity</i>												
Ethnic heterogeneity				2.210 ***	0.385	9.114				2.009 ***	0.408	7.456
<i>Economic disadvantage</i>												
Proportion below poverty level in 1999				2.700 ***	0.681	14.881				2.039 **	0.758	7.686
<i>Residential instability</i>												
Proportion moved in past 5 years				0.578	0.522	1.782				0.197	0.552	1.218
Proportion homes not owner occupied				1.818 ***	0.423	6.160				1.728 ***	0.516	5.632
<i>Family disruption</i>												
Proportion female-headed households				3.087	1.668	21.915				2.015	1.747	7.499
<u>Measures of Community Social Organization</u>												
<i>Associations/organizations</i>												
Number of civic/social orgs, per 1000							0.233 ***	0.030	1.263	0.103 **	0.035	1.108
<i>Religious involvement</i>												
Number of churches, per 1000 population							-0.053	0.041	0.949	-0.101 *	0.045	0.904
Adherence rate of civic churches, per 1000							-0.0002	0.000	0.9998	-0.0002	0.000	0.9998
<i>Voting behavior (presidential election)</i>												
Margin of victory of winning candidate							-0.244	0.162	0.784	-0.172	0.179	0.842
Turnout of voting age citizens							-2.504 ***	0.526	0.082	-1.563 **	0.517	0.209
	[R^2=0.626]			[R^2=0.702]			[R^2=0.662]			[R^2=0.711]		

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

Combining and comparing structural and community measures of disorganization

In addition to identifying the effects of both structural measures of disorganization and community measures of social organization, I explore how these measures relate to one another and which are stronger predictors of violent and property crime rates. Bivariate correlations between these structural and community measures (shown below in Table 18) demonstrate that, with few exceptions, structural antecedents of social disorganization are negatively correlated with measures of community social organization. Because these two sets of variables are related to one another, it is possible that the community measures may help to mediate the relationship between the structural measures of disorganization and property and violent crime rates.

Table 18: Bivariate Correlations between Structural & Community Measures of Disorganization

	Civic/social orgs.	Number of churches	Civic churches	Margin of victory	Voter turnout
Ethnic heterogeneity	-0.246***	-0.214***	-0.258***	-0.136***	-0.415***
Proportion below poverty	-0.148***	0.268***	-0.237***	0.003	-0.396***
Moved in past 5 years	-0.181***	-0.509***	-0.285***	-0.050**	-0.195***
Homes not owner occupied	0.004	-0.294***	0.021	-0.028	-0.209***
Female-headed households	-0.291***	-0.240***	-0.304***	-0.229***	-0.494***

Social disorganization theory suggests that structural characteristics increase disorganization in a community, which in turn increases crime, so I expect that the effects of the structural measures will be reduced when the measures of community organization are added to the models.

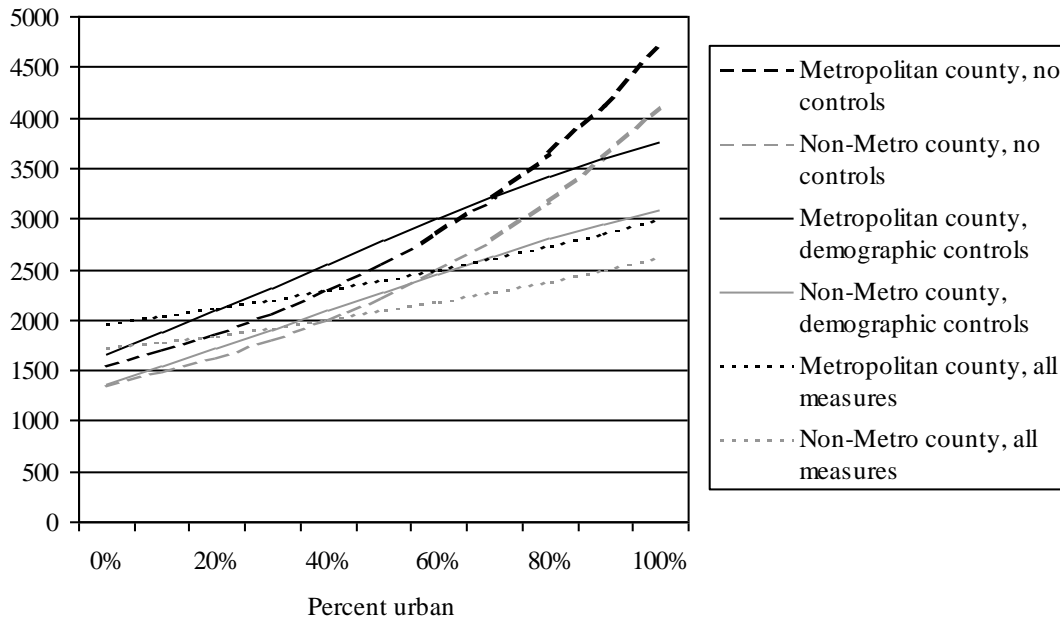
Both the structural and community measures were strong predictors of property crime rates, and both helped to reduce the effects of the measures of rurality. The measures of rurality and demographic characteristics explain nearly half of the variation in property crime rates. Interestingly, it appears that the community and structural measures are approximately equally

good predictors of property crime, as adding the structural measures of disorganization increase this to 58%, while the community measures bump the explained variance to 59%.

To further identify the independent contribution of each set of variables, I add them to the model together (model 4 in Table 16). I find that when the structural and community measures are combined, the effects of the structural characteristics are all reduced. The effects of the poverty rate and the proportion of homes that are not owner occupied are reduced to non-significance, while the effects of ethnic heterogeneity and the proportion of residents who moved in the prior 5 years are reduced. For the community measures, on the other hand, when added together with the structural measures, some of the effects are reduced slightly while others increase.

This supports the idea that measures of community organization serve as a partial mediator of the effects of structural antecedents of disorganization on property crime rates. In addition, when all of the structural and community measures of social disorganization are added to the model together, the effects of rurality are much reduced. The differences in property crime rates for metropolitan, micropolitan, and non-metro counties are smaller than in the model that only controls for demographic characteristics. The effect of proportion urban is substantially reduced as well.

Figure 7: Fitted Property Crime Rates, Controlling for All Measures of Disorganization

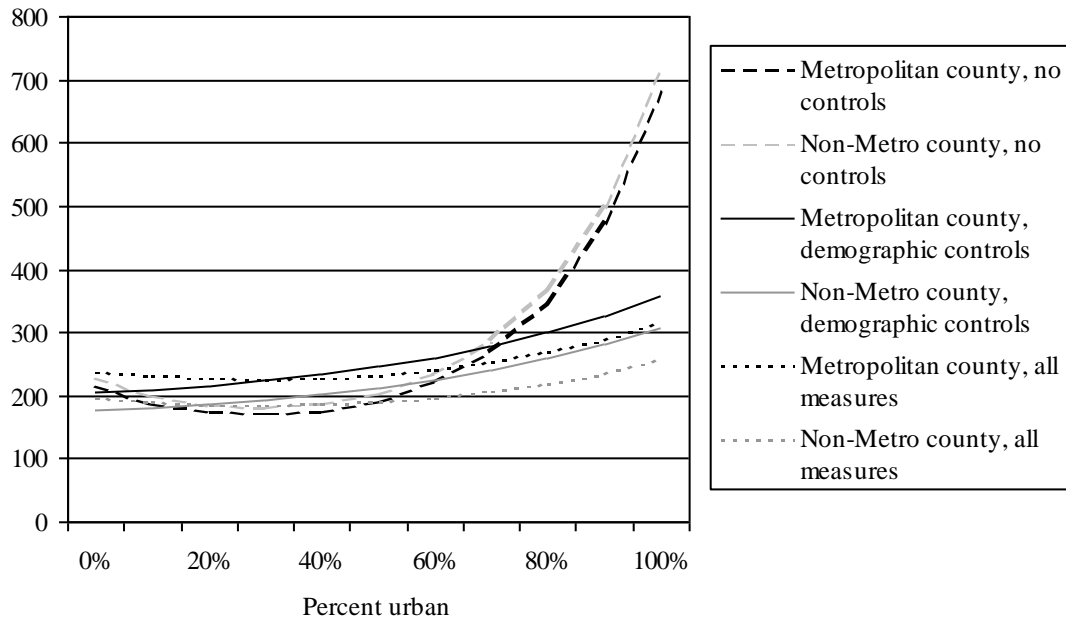


The figure above shows fitted crime rates for metropolitan and non-metropolitan counties by the percent urban (micropolitan counties are excluded for simplicity; their crime rates fall between those of metropolitan and non-metro counties). I include fitted values from a model with no controls (dashed lines), a model that controls for the demographic measures (solid lines), as well as for a model that also holds constant all of the measures of disorganization at their means (dotted lines). The figure clearly shows how the inclusion of the structural and community measures has reduced the effects of rurality on crime. The slope of the lines is much flatter as the increase in crime rates with increased percentage urban is much smaller. With the controls for disorganization, the lines for the county types are closer together, demonstrating that those differences are reduced as well, and supporting my hypotheses about measures of disorganization reducing urban/rural differences for property crime rates.

The findings for violent crime rates differ considerably from those for property crime. The inclusion of measures of rurality and demographic characteristics explains nearly 63% of the variance in violent crime rates. Adding the structural measures of disorganization to the model increases this to 70%, while controlling for community variables only explains 66% of the variation in crime rates. Clearly, the structural measures of disorganization are better predictors of violent crime rates, as compared to the community measures. When all of the variables are modeled together, the effects of most of them are reduced slightly, but there is little indication that the community measures are mediating the effects of the structural variables or vice versa.

I also hypothesize that measures of social disorganization will reduce urban/rural differences in crime rates. The figure below shows fitted values for metropolitan and non-metro counties by percent urban. The demographic measures (solid lines) explain a large portion of the variation in violent crime rates by location (compared to dashed lines). Including the measures of social disorganization (dotted lines) explains more of the urban/rural differences in violent crime rates, largely reducing the effect of percent urban. This provides some support for my hypotheses that social disorganization theory helps to explain the effect of rurality on crime, though the findings for violent crime are not as strong or consistent as those for property crime.

Figure 8: Fitted Violent Crime Rates, Controlling for All Measures of Disorganization



CHAPTER 6 DIFFERENCES IN PREDICTORS OF CRIME RATES IN RURAL AND URBAN PLACES

The prior set of analyses (in Chapter 5) confirms that measures of social disorganization help to explain some of the differences between rural and urban crime rates. I hypothesize that, although social disorganization theory can be applied to rural places as well as urban areas, there will be differences by location in the strength of the effects of these predictors of crime. In general, I expect the structural measures of social disorganization to be better predictors of crime rates in more urban places, while measures of community social organization will better predict crime in rural counties.

To test this, I first split my sample into metropolitan, micropolitan, and non-metro counties and calculate bivariate correlations for each predictor with violent and property crime rates (shown in Table 19 below). Calculating correlations separately for each county type allows me to identify patterns in these relationships by rurality, and I do find clear patterns of differences in these correlations across metropolitan, micropolitan, and non-metro counties.

The demographic variables—measures of the age, gender, and racial composition of a county—are all more strongly correlated with violent and property crime rates in metropolitan counties than in non-metro counties (micropolitan places generally fall in between). The same is true for all of the structural antecedents of disorganization as well; these are more closely correlated with crime rates in metropolitan counties as compared to their non-metro counterparts. This pattern is not continued for the measures of community social organization. Though the correlations between the crime rates and the number of churches are larger in metropolitan than in non-metro counties, the opposite is true for the adherence rate of civically engaged religions and the margin of victory in the 2000 presidential election, which are more correlated with crime

in rural counties. In addition, the number of civic and social organizations is negatively correlated with crime in non-metro counties, but positively correlated in metropolitan areas.

It is plausible that the effects of these demographic characteristics, structural measures, and measures of community organization will differ in rural and urban places, so I model property and violent crime rates separately for each county type (shown in Tables 20 and 21). The patterns of differences in effects for metropolitan, micropolitan, or non-metro counties are not quite as consistent as those shown in the correlations, but a few relationships stand out. Measures of economic disadvantage and residential instability are generally better predictors of property and violent crime rates in metropolitan counties, compared to non-metro places. This supports my hypothesis that structural measures of disorganization better predict metropolitan crime. Similarly, the measure of the number of churches per 1000 population is a stronger predictor of crime in non-metropolitan counties, suggesting that community measures better predict rural crime. Contrary to my expectations, the measures of voting behavior are more related to crime in metropolitan areas.

Though these analyses that separate metropolitan, micropolitan, and non-metro counties provide a useful overall picture of rural/urban differences, they do not identify which differences are statistically significant or examine differences by the percent urban. To test for significant differences in the predictors of property and violent crime rates, I include interaction terms, interacting my explanatory measures with the proportion urban, as well as with metropolitan or micropolitan location (non-metro remains the reference category). I model interactions with demographic measures, structural measures of disorganization, and measures of community social organization separately, then identify final models with significant interactions predicting property and violent crime rates.

Table 19: Bivariate Correlations between Crime Rates and Predictors, by County Type

	Correlations with Property Crime Rate			Correlations with Violent Crime Rate		
	Metro Counties	Micro Counties	Non-Metro Counties	Metro Counties	Micro Counties	Non-Metro Counties
<u>Demographic Measures</u>						
Proportion male	-0.239 ***	-0.110 **	-0.037	-0.239 ***	-0.137 ***	-0.016
Proportion aged 15-29	0.307 ***	0.128 ***	0.112 ***	0.167 ***	0.016	0.140 ***
Proportion Black	0.352 ***	0.316 ***	0.137 ***	0.508 ***	0.504 ***	0.304 ***
Proportion Hispanic	0.220 ***	0.128 **	0.036	0.206 ***	0.142 ***	0.110 ***
Proportion other races	0.243 ***	0.194 ***	0.024	0.237 ***	0.192 ***	0.106 ***
<u>Structural Measures of Social Disorganization</u>						
<i>Racial/ethnic heterogeneity</i>						
Ethnic heterogeneity	0.480 ***	0.427 ***	0.207 ***	0.557 ***	0.597 ***	0.368 ***
<i>Economic disadvantage</i>						
Proportion below poverty level in 1999	0.288 ***	0.269 ***	-0.021	0.408 ***	0.447 ***	0.266 ***
<i>Residential instability</i>						
Proportion moved in past 5 years	0.448 ***	0.316 ***	0.312 ***	0.204 ***	0.046	0.106 ***
Proportion homes not owner occupied	0.552 ***	0.341 ***	0.143 ***	0.472 ***	0.157 ***	0.098 ***
<i>Family disruption</i>						
Proportion female-headed households	0.483 ***	0.401 ***	0.193 ***	0.615 ***	0.574 ***	0.365 ***
<u>Measures of Community Social Organization</u>						
<i>Associations/organizations</i>						
Number of civic/social orgs, per 1000	0.078 *	0.023	-0.009	-0.001	-0.144 ***	-0.130 ***
<i>Religious involvement</i>						
Number of churches, per 1000 population	-0.414 ***	-0.293 ***	-0.365 ***	-0.269 ***	-0.074	-0.159 ***
Adherence rate of civic churches, per 1000	-0.037	-0.196 ***	-0.209 ***	-0.041	-0.246 ***	-0.232 ***
<i>Voting behavior (presidential election)</i>						
Margin of victory of winning candidate	-0.080 *	-0.100 *	-0.184 ***	-0.005	-0.114 **	-0.131 ***
Turnout of voting age citizens	-0.215 ***	-0.305 ***	-0.167 ***	-0.277 ***	-0.410 ***	-0.275 ***
N	1022	609	1207	1022	609	1207

Table 20: Predicting Property Crime Rates, by County Type

	Model 1: Metropolitan Counties			Model 2: Micropolitan Counties			Model 3: Non-Metro Counties		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-3.657 ***	0.048	0.026	-3.643 ***	0.060	0.026	-4.051 ***	0.045	0.017
<u>Measures of Rurality</u>									
Proportion Urban	0.767 ***	0.188	2.153	0.396 *	0.180	1.486	0.520 ***	0.125	1.683
Proportion Urban^2	-0.328	0.279	0.720	0.670	0.430	1.955	-0.104	0.252	0.901
<u>Demographic Measures</u>									
Proportion male	-2.715 *	1.055	0.066	-2.819 *	1.376	0.060	-3.567 ***	0.971	0.028
Proportion aged 15-29	-0.763	0.597	0.466	-0.913	0.508	0.401	-1.754 **	0.635	0.173
Proportion Black	-0.698	0.388	0.498	-1.332	0.750	0.264	-1.238 **	0.426	0.290
Proportion Hispanic	0.067	0.273	1.069	-0.395	0.264	0.674	-0.141	0.218	0.869
Proportion other races	-1.369 **	0.471	0.254	-0.379	0.474	0.685	-1.428 **	0.466	0.240
<u>Structural Measures of Social Disorganization</u>									
<i>Racial/ethnic heterogeneity</i>									
Ethnic heterogeneity	0.994 ***	0.238	2.703	0.675	0.455	1.963	1.213 ***	0.350	3.364
<i>Economic disadvantage</i>									
Proportion below poverty level in 1999	0.961	0.530	2.615	0.023	0.572	1.023	-0.705	0.457	0.494
<i>Residential instability</i>									
Proportion moved in past 5 years	1.352 *	0.561	3.865	1.602 **	0.553	4.963	0.509	0.463	1.663
Proportion homes not owner occupied	0.464	0.289	1.590	0.005	0.535	1.005	0.622	0.601	1.863
<i>Family disruption</i>									
Proportion female-headed households	4.167 ***	1.226	64.498	7.714 ***	1.764	2238.956	3.146 *	1.607	23.240
<u>Measures of Community Social Organization</u>									
<i>Associations/organizations</i>									
Number of civic/social orgs, per 1000	0.217 ***	0.043	1.242	0.170 **	0.058	1.186	0.056	0.047	1.058
<i>Religious involvement</i>									
Number of churches, per 1000 population	-0.072	0.063	0.931	-0.100 *	0.042	0.905	-0.131 ***	0.025	0.877
Adherence rate of civic churches, per 1000	-0.0006 ***	0.000	0.9994	-0.0003	0.000	0.9997	-0.0005 ***	0.000	0.9995
<i>Voting behavior (presidential election)</i>									
Margin of victory of winning candidate	-0.272 **	0.094	0.762	-0.161	0.136	0.851	-0.107	0.106	0.899
Turnout of voting age citizens	-0.481 *	0.201	0.618	-0.520	0.313	0.595	-0.555	0.295	0.574

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

Table 21: Predicting Violent Crime Rates, by County Type

	Model 1: Metropolitan Counties			Model 2: Micropolitan Counties			Model 3: Non-Metro Counties		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-5.902 ***	0.067	0.003	-6.069 ***	0.092	0.002	-6.226 ***	0.092	0.002
<u>Measures of Rurality</u>									
Proportion Urban	0.266	0.183	1.305	0.233	0.302	1.262	0.725 **	0.234	2.065
Proportion Urban^2	0.567	0.374	1.763	0.502	0.662	1.652	0.876	0.501	2.401
<u>Demographic Measures</u>									
Proportion male	-4.579 **	1.703	0.010	-3.610 *	1.701	0.027	-3.086 **	0.970	0.046
Proportion aged 15-29	-3.212 **	1.023	0.040	-2.087 ***	0.636	0.124	-1.152	0.945	0.316
Proportion Black	0.165	0.592	1.180	-0.960	0.859	0.383	-1.345 **	0.458	0.260
Proportion Hispanic	-0.316	0.195	0.729	-0.633 *	0.307	0.531	-0.339	0.298	0.713
Proportion other races	-0.270	0.673	0.764	-0.482	0.462	0.618	-1.108 *	0.557	0.330
<u>Structural Measures of Social Disorganization</u>									
<i>Racial/ethnic heterogeneity</i>									
Ethnic heterogeneity	1.917 ***	0.458	6.797	1.952 ***	0.456	7.046	2.122 ***	0.500	8.345
<i>Economic disadvantage</i>									
Proportion below poverty level in 1999	2.292 *	0.913	9.896	0.792	0.723	2.207	-0.213	0.742	0.808
<i>Residential instability</i>									
Proportion moved in past 5 years	0.393	0.633	1.481	0.967	0.716	2.631	-0.873	0.794	0.418
Proportion homes not owner occupied	1.664 **	0.537	5.282	-0.436	0.738	0.647	-1.117	1.064	0.327
<i>Family disruption</i>									
Proportion female-headed households	1.150	1.871	3.158	6.840 **	2.205	934.616	6.107 ***	1.864	449.072
<u>Measures of Community Social Organization</u>									
<i>Associations/organizations</i>									
Number of civic/social orgs, per 1000	0.094 *	0.043	1.099	0.083	0.088	1.086	-0.027	0.072	0.973
<i>Religious involvement</i>									
Number of churches, per 1000 population	-0.048	0.101	0.953	-0.073	0.065	0.929	-0.114 ***	0.032	0.892
Adherence rate of civic churches, per 1000	-0.0001	0.000	0.9999	-0.0002	0.000	0.9998	-0.0005 *	0.000	0.9995
<i>Voting behavior (presidential election)</i>									
Margin of victory of winning candidate	-0.214	0.193	0.807	-0.031	0.150	0.969	0.008	0.151	1.008
Turnout of voting age citizens	-1.654 **	0.589	0.191	-1.768 ***	0.446	0.171	-0.459	0.401	0.632

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

Table 22 shows results of interactions with the demographic measures, and results are fairly consistent across property and violent crime. There are significant interactions of rurality and the proportion of the population aged 15-29, as well as with measures of the minority population. The main effects of the age and racial composition are negative, but the interaction terms are positive, indicating that the effects of the proportion aged 15-29 and the proportion of residents who are Black or other races are smaller in more urban locations.

I next test interactions between measures of rurality and structural measures of disorganization, as shown in Table 23. In general, these structural measures are positively related to crime and most of the interaction terms are also positive. This suggests that structural measures are better predictors of crime in more urban places. However, most of the interaction terms are not statistically significant and many do not follow consistent patterns for both measures of rural location and both measures of crime. Yet a clear pattern does exist for poverty; the interactions with poverty are positive across all four models (though not always significant), which suggests that poverty is a strong predictor of crime rates in more urban places, but not so in rural areas.

Table 22: Predicting Property and Violent Crime Rates: Interactions between Rurality and Demographic Measures

	Model 1: Property Crime			Model 2: Property Crime			Model 3: Violent Crime			Model 4: Violent Crime		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
<u>Measures of Rurality</u>												
Micropolitan	0.117 ***	0.027	1.124	0.460	0.541	1.584	0.112 **	0.041	1.118	0.312	0.515	1.366
Metropolitan	0.140 ***	0.031	1.150	0.656	0.361	1.927	0.204 ***	0.054	1.226	1.116	1.002	3.051
Proportion Urban	-0.582	0.950	0.559	0.493	0.107	1.636	-0.280	2.201	0.756	0.193	0.123	1.213
Proportion Urban^2	-0.061	0.189	0.941	-0.057 ***	0.191	0.945	0.244	0.401	1.276	0.617	0.319	1.854
<u>Demographic Measures</u>												
Proportion male	-3.319 ***	0.728	0.036	-1.075	0.856	0.341	-2.727 *	1.126	0.065	-1.875	1.165	0.153
Proportion aged 15-29	-1.478 **	0.537	0.228	-2.846 ***	0.809	0.058	-5.165 ***	0.836	0.006	-3.553 ***	1.043	0.029
Proportion Black	-1.288 **	0.431	0.276	-1.462 ***	0.419	0.232	-0.607	0.588	0.545	-0.514	0.572	0.598
Proportion Hispanic	0.030	0.367	1.030	-0.251	0.273	0.778	-0.912 **	0.317	0.402	-0.010	0.467	0.990
Proportion other races	-1.238 **	0.434	0.290	-1.769 ***	0.402	0.171	-0.982 *	0.455	0.375	-1.459 **	0.504	0.233
<u>Interactions</u>												
Male * Proportion urban	0.884	1.984	2.421				-1.594	4.691	0.203			
Age 15-29 * Proportion urban	2.788	1.456	16.249				6.171 **	1.996	478.658			
Black * Proportion urban	0.825	0.434	2.283				0.830	0.562	2.294			
Hispanic * Proportion urban	-0.103	0.860	0.902				0.777	0.557	2.174			
Other races * Proportion urban	-0.324	0.816	0.724				1.280	0.875	3.598			
Male * Micropolitan				-1.519	1.119	0.219				-0.421	0.992	0.656
Male * Metropolitan				-2.267 **	0.717	0.104				-2.387	2.255	0.092
Age 15-29 * Micropolitan				1.598 *	0.785	4.945				-0.477	1.093	0.621
Age 15-29 * Metropolitan				2.563 **	0.833	12.979				0.811	1.315	2.249
Black * Micropolitan				0.455 **	0.166	1.576				0.459 **	0.173	1.583
Black * Metropolitan				0.639 *	0.249	1.894				0.375	0.275	1.455
Hispanic * Micropolitan				-0.143	0.317	0.866				-0.657	0.442	0.519
Hispanic * Metropolitan				0.257	0.309	1.293				-0.387	0.390	0.679
Other races * Micropolitan				1.135 **	0.425	3.110				1.163 *	0.467	3.199
Other races * Metropolitan				0.428	0.508	1.535				1.048	0.629	2.851

*p<.05 **p<.01 ***p<.001, models also include intercept, structural and community measures

Table 23: Predicting Property and Violent Crime Rates: Interactions between Rurality and Structural Antecedents of Disorganization

	Model 1: Property Crime			Model 2: Property Crime			Model 3: Violent Crime			Model 4: Violent Crime		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
<u>Measures of Rurality</u>												
Micropolitan	0.099 ***	0.029	1.104	-0.397 *	0.281	0.672	0.077 ***	0.041	1.080	0.101	0.351	1.107
Metropolitan	0.128 ***	0.034	1.136	-0.696	0.290	0.499	0.158	0.048	1.171	0.066	0.426	1.068
Proportion Urban	-0.381	0.426	0.683	0.523 ***	0.099	1.687	0.074	0.553	1.077	0.276 *	0.117	1.318
Proportion Urban^2	-0.013	0.179	0.987	-0.062	0.180	0.940	0.192	0.327	1.212	0.569 *	0.285	1.766
<u>Structural Antecedents of Social Disorganization</u>												
<i>Racial/ethnic heterogeneity</i>												
Ethnic heterogeneity	0.798 ***	0.244	2.222	0.964 **	0.321	2.622	1.560 ***	0.372	4.758	1.817 ***	0.461	6.154
<i>Economic disadvantage</i>												
Proportion below poverty level in 1999	-0.088	0.378	0.915	-1.097 *	0.555	0.334	1.657	0.893	5.245	1.028	0.977	2.795
<i>Residential instability</i>												
Proportion moved in past 5 years	0.511	0.540	1.667	0.765	0.635	2.150	1.003	0.614	2.725	1.275	0.816	3.577
Proportion homes not owner occupied	1.074 *	0.531	2.926	-0.210	0.601	0.811	-0.552	0.797	0.576	-0.169	0.839	0.845
<i>Family disruption</i>												
Proportion female-headed households	5.105 ***	1.371	164.855	3.849 *	1.573	46.964	4.568 *	1.966	96.326	3.188	2.258	24.234
<u>Interactions</u>												
Ethnic heterogeneity * Proportion urban	0.590	0.499	1.804				1.451 *	0.709	4.265			
Poverty * Proportion urban	2.192	1.450	8.951				1.500	2.102	4.481			
Moved * Proportion urban	1.875	1.069	6.519				-1.392	1.591	0.249			
Not owner occupied * Proportion urban	-1.431	1.110	0.239				3.817 *	1.864	45.448			
Female-headed households * Proportion urban	-0.471	1.672	0.625				-4.834 *	2.319	0.008			
Ethnic heterogeneity * Micropolitan				-0.135	0.351	0.873				0.284	0.404	1.329
Ethnic heterogeneity * Metropolitan				-0.011	0.301	0.989				0.194	0.401	1.215
Poverty * Micropolitan				1.087	0.637	2.965				0.725	1.055	2.065
Poverty * Metropolitan				2.114 **	0.755	8.283				1.229	1.223	3.418
Moved * Micropolitan				0.207	0.703	1.230				-0.524	0.877	0.592
Moved * Metropolitan				0.572	0.668	1.771				-1.129	0.992	0.323
Not owner occupied * Micropolitan				0.364	0.724	1.439				-0.012	0.939	0.988
Not owner occupied * Metropolitan				0.589	0.698	1.802				1.909	1.031	6.746
Female-headed households * Micropolitan				1.748	1.358	5.742				0.246	1.796	1.279
Female-headed households * Metropolitan				1.066	1.249	2.905				-1.356	1.787	0.258

*p<.05 **p<.01 ***p<.001, models also include intercept, demographic and community measures

Table 24: Predicting Property and Violent Crime Rates: Interactions between Rurality and Measures of Community Organization

	Model 1: Property Crime			Model 2: Property Crime			Model 3: Violent Crime			Model 4: Violent Crime		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
<u>Measures of Rurality</u>												
Micropolitan	0.103 ***	0.025	1.108	0.279 *	0.179	1.321	0.085 **	0.044	1.089	0.328	0.255	1.388
Metropolitan	0.129 ***	0.032	1.138	0.407	0.206	1.502	0.164	0.053	1.178	0.335	0.287	1.399
Proportion Urban	0.037	0.314	1.037	0.454 ***	0.112	1.574	0.575	0.446	1.777	0.205	0.141	1.227
Proportion Urban^2	0.585 *	0.250	1.794	0.055	0.180	1.056	0.894 *	0.429	2.446	0.634 *	0.313	1.884
<u>Measures of Community Social Organization</u>												
<i>Associations/organizations</i>												
Number of civic/social orgs, per 1000	0.153 ***	0.037	1.166	0.120 *	0.049	1.127	-0.031	0.058	0.969	-0.059	0.071	0.943
<i>Religious involvement</i>												
Number of churches, per 1000 population	-0.142 ***	0.031	0.868	-0.165 ***	0.033	0.848	-0.078	0.048	0.925	-0.122 **	0.040	0.885
Adherence rate of civic churches, per 1000	-0.0002	0.000	0.9998	-0.0004	0.000	0.9996	-0.0004	0.000	0.9996	-0.0005	0.000	0.9995
<i>Voting behavior (presidential election)</i>												
Margin of victory of winning candidate	-0.259 **	0.095	0.771	-0.263	0.141	0.769	0.022	0.116	1.022	0.061	0.187	1.063
Turnout of voting age citizens	-0.639 *	0.263	0.528	0.172	0.353	1.187	-0.790	0.532	0.454	-0.652	0.607	0.521
<u>Interactions</u>												
Civic/social orgs * Proportion urban	0.135	0.071	1.144				0.246 *	0.108	1.279			
Number of churches * Proportion urban	0.216	0.120	1.241				0.188	0.161	1.207			
Adherents civic churches * Proportion urban	-0.001	0.000	0.999				0.001	0.001	1.001			
Margin of victory * Proportion urban	-0.017	0.290	0.983				-0.491	0.446	0.612			
Voter turnout * Proportion urban	-0.021	0.492	0.980				-1.912 *	0.827	0.148			
Civic/social orgs * Micropolitan				0.086	0.055	1.089				0.072	0.065	1.075
Civic/social orgs * Metropolitan				0.131 **	0.049	1.139				0.175 *	0.078	1.191
Number of churches * Micropolitan				0.061	0.032	1.063				0.080	0.048	1.083
Number of churches * Metropolitan				0.031	0.057	1.032				0.043	0.088	1.044
Adherents civic churches * Micropolitan				0.0001	0.000	1.0001				0.0003	0.000	1.0003
Adherents civic churches * Metropolitan				-0.0001	0.000	0.9999				0.0004	0.000	1.0004
Margin of victory * Micropolitan				0.040	0.149	1.041				-0.354	0.264	0.702
Margin of victory * Metropolitan				-0.021	0.155	0.979				-0.235	0.231	0.790
Voter turnout * Micropolitan				-0.818 *	0.317	0.441				-0.927 *	0.438	0.396
Voter turnout * Metropolitan				-0.912 **	0.341	0.402				-0.987 *	0.484	0.373

*p<.05 **p<.01 ***p<.001, models also include intercept, demographic and structural measures

I also examine interactions with measures of community social organization (Table 24). Because most of the main effects of these measures are negative, negative interaction terms would suggest these predictors are more strongly related to crime rates in more metropolitan locations, while positive interaction terms would suggest weaker relationships in metro areas. The interactions with voting behavior and civic and social organizations are mostly negative, indicating that voter turnout, the margin of victory in the 2000 presidential election, and the number of civic organizations per 1000 population are better predictors of crime in urban areas. Interactions with the number of churches, on the other hand, suggest that this measure may be a stronger predictor of rural crime.

Lastly, I model the interactions together to identify which effects vary significantly by rurality. I find that the interactions with the racial composition disappear when the interactions with the structural measures of disorganization are added to the model. Similarly, most of the interactions with measures of community social organization are no longer significant when interactions with poverty are included. The significant interactions in my final models (in Table 25) include the proportion aged 15-29 by proportion urban, the poverty rate by metropolitan and micropolitan location, and the number of civic and social organizations per 1000 population.⁵

The main effect of the proportion aged 15-29 is negative for both property and violent crime rates, but the interaction term with the proportion urban is positive. For a county with no urban population, a standard deviation (about 4%) increase in the proportion aged 15-29 is associated with a decrease of 6% in property crime rates and over 20% for violent, while a similar increase in a county that is 100% urban corresponds to a 5% increase in property crime

⁵ The interaction terms for age 15-29 by metropolitan and micropolitan location were significant predictors of property crime rates. Instead, I chose to include the interaction term for age by percent urban, even though it does not quite reach statistical significance ($p=.068$), as this allows the model of property crime rates to match up with that for violent crime.

rates and a 7% increase in violent crime. Because people aged 15-29 tend to commit more crimes, the latter effect is what one would expect to find, yet the presence of young people actually reduces crime in the most rural places. Compared to urban areas, rural places have higher rates of out migration, particularly among younger people. Though I include measures of residential instability in my models, they do not account for out-migration. It may be that this age measure taps into this phenomenon, and in rural areas, low proportions of young people represent communities in decline, while high proportions represent thriving communities.

Poverty is included as a structural indicator of social disorganization in much research and is typically associated with higher crime rates. However, I find that for non-metropolitan counties, a standard deviation increase in poverty rate, an increase of about 6%, is actually associated with a 13% decrease in property crime rates—the opposite of what is expected. For violent crime in non-metro counties, a similar increase in poverty increases crime rates by 2%—a non-significant change. For metropolitan counties, a 6% increase in the poverty rate corresponds with increases in property and violent crime rates of 6% and 14%, respectively. This is consistent with findings from Osgood and Chamber's (2000) study of rural youth violence. They suggest that in rural areas, the negative effects of poverty are cancelled out by poverty's negative correlation with instability. In rural places, poor communities tend to be more stable than average (as poor residents may be "stuck" in their current living condition and unable to afford to leave). This may indicate that in rural places, residential instability is a better indicator of disorganization than is poverty.

Table 25: Predicting Property and Violent Crime Rates: Final Models

	Model 1: Property Crime			Model 2: Violent Crime		
	B	Standard Error	Event Rate Ratio	B	Standard Error	Event Rate Ratio
Intercept	-3.853 ***	0.041	0.021	-6.205 ***	0.058	0.002
<u>Measures of Rurality</u>						
Micropolitan	-0.426 ***	0.097	0.653	-0.405 **	0.140	0.667
Metropolitan	-0.593 ***	0.102	0.553	-0.481 **	0.163	0.618
Proportion Urban	0.036	0.264	1.037	-1.089 **	0.338	0.336
Proportion Urban^2	-0.081	0.183	0.922	0.409	0.299	1.505
<u>Demographic Measures</u>						
Proportion male	-2.907 ***	0.738	0.055	-3.338 **	1.080	0.036
Proportion aged 15-29	-1.530 **	0.528	0.217	-5.716 ***	0.743	0.003
Proportion Black	-0.862 *	0.360	0.422	-0.163	0.543	0.850
Proportion Hispanic	-0.107	0.270	0.898	-0.410 *	0.168	0.664
Proportion other races	-1.113 **	0.376	0.328	-0.466	0.524	0.627
<u>Structural Measures of Social Disorganization</u>						
<i>Racial/ethnic heterogeneity</i>						
Ethnic heterogeneity	0.904 ***	0.215	2.471	2.025 ***	0.411	7.573
<i>Economic disadvantage</i>						
Proportion below poverty level in 1999	-2.166 ***	0.493	0.115	0.313	0.798	1.367
<i>Residential instability</i>						
Proportion moved in past 5 years	1.276 **	0.456	3.583	0.093	0.554	1.098
Proportion homes not owner occupied	0.273	0.322	1.314	1.498 **	0.530	4.471
<i>Family disruption</i>						
Proportion female-headed households	5.055 ***	1.063	156.744	2.201	1.790	9.035
<u>Measures of Community Social Organization</u>						
<i>Associations/organizations</i>						
Number of civic/social orgs, per 1000	0.048	0.049	1.049	-0.195 *	0.079	0.823
<i>Religious involvement</i>						
Number of churches, per 1000 population	-0.121 ***	0.032	0.886	-0.072	0.045	0.930
Adherence rate of civic churches, per 1000	0.000 ***	0.000	1.000	0.000	0.000	1.000
<i>Voting behavior (presidential election)</i>						
Margin of victory of winning candidate	-0.298 ***	0.091	0.742	-0.182	0.168	0.833
Turnout of voting age citizens	-0.561 ***	0.166	0.571	-1.467 **	0.541	0.231
<u>Interactions</u>						
Age 15-29 * Proportion urban	2.657	1.455	14.251	7.462 ***	1.822	1740.910
Poverty * Micropolitan	2.186 ***	0.451	8.902	1.602 *	0.681	4.965
Poverty * Metropolitan	3.064 ***	0.594	21.416	1.821 *	0.865	6.178
Civic/social orgs * Micropolitan	0.139 *	0.057	1.149	0.191 **	0.063	1.211
Civic/social orgs * Metropolitan	0.192 ***	0.050	1.212	0.299 ***	0.070	1.348
	[R ² =0.634]			[R ² =0.715]		

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

I also find significant interactions with the measure of the number of civic and social organizations per 1000 population. Overall, this measure is positively associated with crime rates, which is surprising; I expected this measure to be an indicator of community involvement and to be associated with lower crime rates. Because I find the opposite, I suspect the number of civic and social organizations may reflect a response to existing community problems. The interaction terms suggest that this may be the case in metropolitan counties, and that the relationship in non-metro counties is in line with my original expectations. In metropolitan counties, an increase of .6 organizations per 1000 population (one standard deviation) coincides with increases of 16% for property crime rates and 6% for violent crime rates. In non-metropolitan counties, on the other hand, a similar increase in organizations increases property crime by only 3%, a non-significant increase, and is associated with an 11% decrease in violent crime rates. Thus, the number of civic associations is a better indicator of community organization in more rural places.

Overall, I find significant differences by rural/urban location in the effects of these indicators of social disorganization. The differences in the effects of poverty are particularly noteworthy, as this measure is used as a standard predictor of social disorganization theory, yet does not predict higher crime rates in rural communities. Though social disorganization theory is generally applicable to non-metropolitan populations, it is important to be aware of the differences as well.

CHAPTER 7 DISCUSSION AND CONCLUSIONS

Though approximately 20% of the United States population lives in non-metropolitan places, research on crime in rural areas is relatively lacking. There are few systematic analyses of rural and urban crime rates, and rural places are conspicuously absent from most research on communities and crime. This dissertation contributes to research on social disorganization theory with a comprehensive analysis of property and violent crime rates in the United States using county-level data from 2000.

These analyses focus on three main topics. First, I identify rural/urban differences in crime rates, specifying which measures of rurality are and are not associated with differences in crime rates. Next, I focus on explaining rural/urban differences in crime rates, testing to what extent social disorganization theory accounts for these differences. Last, I explore whether the effects of social disorganization vary between rural and urban places.

My findings are generally consistent with prior research on social disorganization theory and rural and urban crime rates; more urban places have higher rates of property and violent crime. Social disorganization theory, though more frequently used to explain crime in urban communities, can be extended to analyses of rural crime as well. This dissertation extends prior research to specify in detail the relationships between crime rates, rurality, and social disorganization. This study makes contributions to the research literature on rurality and crime, as well as that on social disorganization theory. To describe these contributions, I return to my initial hypotheses.

Most prior research uses either a two- or three-category measure of rural or urban location. I argue that this does not adequately account for all of the variation among rural and

urban places and hypothesize that crime rates will vary across a wide variety of dimensions of rurality.

Hypothesis 1: More urbanized places will have higher crime rates than rural places.

1a: Metropolitan counties will have higher crime rates than non-metropolitan counties.

1b: Non-metro counties that are adjacent to metro counties will have higher crime rates than non-metro counties that are not adjacent to metro counties.

1c: Counties with a greater proportion of urban residents will have higher crime rates than counties with less urban populations.

1d: Counties with a greater population density will have higher crime rates.

1e: Counties with a larger population will have higher crime rates.

These hypotheses are confirmed by this study, with one exception; other than adjacency, all of these measures of urbanicity are positively related to crime rates. I find that two of these measures, county type and the proportion urban, combine to capture most of the rural/urban variation in crime rates. The county type variable identifies whether a county is metropolitan, micropolitan, or non-metropolitan. This measure captures the bulk of the variation in crime rates by population size, suggesting that there is a critical mass or threshold effect. When populations reach a certain size, in addition to more potential targets of crime, there may be increased anonymity for residents, which may contribute to increased crime.

The proportion of the population living in urban places (more than 2,500 people) is also positively related to property and violent crime rates. This relationship is curvilinear; for more urban places, the effect of the proportion urban on crime rates is greater (as shown in Figure 4). This measure distinguishes variation within county type (metropolitan, micropolitan, and non-metro counties), by identifying the proportion of residents who live in urban places, as compared to those who are not part of such communities.

The overall county type or metropolitan character as well as the more specific urban settlement patterns of a county's residents are important for understanding county crime rates.

For example, on average, a non-metro county in which the residents live primarily in small towns will have a higher crime rate than a non-metro county with a more remote population. On the other hand, metropolitan counties have higher average crime rates than do non-metro counties with similar proportions of urban populations.

This demonstrates the inadequacy of using a single measure of rural/urban location, particularly a categorical measure of metropolitan location. In order to understand and explain differences between rural and urban crime rates, researchers must first identify exactly where such differences exist. As such, this dissertation provides a crucial first step for analyses of rural and urban crime rates.

I also focus on explaining these differences between rural and urban crime rates. Building on existing research on communities and crime and on rural crime, I identify three sets of measures that I expect to help explain some of the differences in crime rates between rural and urban counties.

Hypothesis 2: Demographic characteristics will account for some of the rural/urban differences in crime rates.

Hypothesis 3: Structural measures of social disorganization will account for some of the differences between rural and urban crime rates.

Hypothesis 4: Measures of community social organization will partially account for the rural/urban differences in crime rates (beyond the effect of structural measures).

I find support for all three of these hypotheses. The proportion of minorities and younger residents is positively correlated with both crime rates and urban location, and so it is reasonable that controlling for these will help to account for the differences between urban and rural crime rates. I do find that controlling for the age, sex, and racial composition of a county reduces rural/urban differences in crime rates, particularly for counties with a higher proportion of urban

residents. However, in prior research, Laub (1983a; 1983b) found that patterns of offending by age, race and sex remained consistent across rural and urban places and that all subgroups had lower rates of offending in rural places.

In light of this, I am somewhat surprised to find that demographic characteristics help to account for urban/rural differences in offending. It is important to note that these studies reflect different levels of analyses; Laub focused on individual offending while this analysis examines aggregate crime rates. In addition, the effects of the demographic measures are reduced when structural indicators of social disorganization are added to the model, suggesting the effects of the demographic composition may actually reflect other measures of social disorganization in a county.

Scholars have suggested that social disorganization theory could account for differences in crime rates between urban and rural places, yet this has remained largely untested. I analyze structural antecedents of social disorganization as well as measures of community social organization. I find that both sets of variables are significant predictors of property and violent crime rates and both help to explain differences in crime rates between rural and urban counties.

Many researchers focus on structural measures (ethnic heterogeneity, economic disadvantage, residential instability, and family disruption) as indicators of social disorganization and consistent with this, I find these are strong predictors of both violent and property crime rates. However, I find that my more direct measures of community organization explain more of the variation in crime rates by rurality. This suggests that community measures may be better predictors of rural crime.

In this vein, I hypothesize that the effects of both structural and community measures of social disorganization may differ in rural and urban places. While I expect social disorganization

theory to be applicable to rural crime, rural communities are substantially different from urban places, and I anticipate the effects of measures of disorganization will vary.

Hypothesis 5: The effects of structural antecedents of social disorganization will vary with the level of rurality of a county.

Hypothesis 6: The effects on crime of community measures of social organization will vary between rural and urban places.

My analyses support these two hypotheses; I find significant interactions between the measures of rurality (percent urban and county type) and some of the structural antecedents of disorganization and community measures of social organization. In general, the structural measures were stronger predictors of crime in more urban places, while the community measures did not show a consistent pattern by place.

Perhaps the most interesting relationship is that with poverty. Overall, poverty is positively related to crime rates; places with higher rates of poverty tend to have higher crime rates. However, this relationship varies drastically by county type. In metropolitan counties, the effect of poverty on property and violent crime rates remains positive. On the other hand, in non-metro counties, net of other measures of social disorganization, poverty is not related to violent crime and is negatively related to property crime rates; in rural places, higher rates of poverty correspond to lower rates of property crime.

While contrary to much research on social disorganization theory, this result is consistent with Osgood and Chamber's study in 2000, in which they found no relationship between poverty and juvenile homicide rates. They suggested that this was the result of a strong negative correlation between poverty and residential instability, which reduced the effect of poverty on crime.

Theoretical implications

Overall, this dissertation highlights the importance of using detailed measures of rurality and urbanicity to identify variation in crime rates. It also provides a comprehensive test of social disorganization in rural areas, confirming assumptions that social disorganization theory is useful for predicting crime rates in rural places and that measures of disorganization help to explain the differences between rural and urban crime rates. Furthermore, I identify rural/urban differences in the effects of measures of social disorganization.

Specifically, the positive effect of poverty on crime rates that is found in metropolitan areas does not extend to more rural places. It is possible that relationships between poverty and other structural antecedents of disorganization or between poverty and more direct measures of disorganization differ in rural and urban places, which could mask or reduce the effect of poverty. Alternatively, it may be that poverty is simply not related to disorganization or to crime in rural places.

There are theoretical implications to these possibilities. In their original version of social disorganization theory, Shaw and McKay (1942) suggested that poverty increased ethnic heterogeneity and residential instability in a community, which in turn contributed to higher rates of crime and delinquency. However, poverty does not predict residential instability in rural areas, which could suggest that it is not poverty alone that increases disorganization, but rather its relationship with other structural antecedents of disorganization (Osgood and Chambers 2000).

Other current formulations of social disorganization theory focus on structural characteristics (including poverty, ethnic heterogeneity, and residential instability) that increase measures of organization in a neighborhood, such as local participation, social cohesion, and collective efficacy, which in turn predict crime. Research supports these models in urban places,

but a key issue is whether or not the positive relationship between poverty and social disorganization holds true in rural places. Perhaps for rural residents, poverty does not disrupt social organization. If this is the case, the relationship between disorganization and crime may still hold in rural areas, suggesting that social disorganization theory is useful for understanding crime in rural places, though the structural antecedents have different relationships to disorganization.

A study of urban crime found that though strength of neighborhood networks is typically viewed as a measure of social organization in a community, strong networks without collective efficacy or solidarity among neighbors may be associated with higher levels of neighborhood crime (Browning, Feinberg, and Dietz 2004). This can be reconciled with social disorganization theory if we understand that much as poverty does not seem to predict disorganization in rural areas, social networks do not always predict disorganization in urban areas.

In my view, focusing on variations in the relationships of neighborhood disorganization with the structural antecedents of disorganization and community indicators of organization is a promising avenue for advancing social disorganization theory. By identifying those elements that more and less consistently correspond to disorganization, researchers may be able to home in on the key processes linking disorganization and crime, leading to a formulation of theory that can be applied across all settings.

Directions for future research

This study extends our knowledge about social disorganization in rural areas; the demographic characteristics and the structural and community measures of social disorganization examined here partially account for the relationship between crime rates and rurality. However,

this effect of rurality on crime is not completely accounted for, as there are still significant differences between rural and urban crime rates. There are numerous potential explanations for the remaining gap in crime rates, and future research should test these, in order to more fully specify the relationship between rurality and crime.

It may be the case that social disorganization theory can completely account for differences in crime rates by rurality, but that I am unable to measure it adequately. Perhaps the level of aggregation of my data does not adequately capture the effects of disorganization in a community. Social disorganization theory describes processes that work at the neighborhood level, yet I use county level data. Crime data, as well as numerous demographic variables and indicators of community context, are available by county for the entire United States. By using these county level measures, I am able to conduct a comprehensive analysis of rural and urban crime rates. However, it may be that the county level data are unable to capture the processes of community organization that occur in smaller neighborhoods. To remedy this, subsequent research should examine smaller units of analysis to identify how the effects of neighborhood level measures and processes vary between rural and urban places, and to what extent they may explain differences in crime rates.

In addition, it is possible that my indicators of disorganization do not adequately measure the level of social disorganization in a community. I test several structural and community measures of disorganization that are consistent with prior research, but research on social disorganization has also included numerous other indicators, such as measures of social cohesion and collective efficacy. If rural and urban places differ on characteristics such as these, in a way that is not captured by the structural and community measures that I test, then other measures of social disorganization could explain additional variation between rural and urban crime rates.

Furthermore, to the extent that the social context of rural places differs from urban communities, measures such as collective efficacy may have differing effects on crime. Though these other measures of social disorganization have been used to predict crime in studies of urban communities, it would be useful for future research to explore how measures such as social cohesion and collective efficacy apply in rural communities as well.

Alternatively, it may be that social disorganization theory cannot fully account for the differences between rural and urban crime rates, and that other explanations are needed. Rural and urban places differ on a wide variety of dimensions, and it is possible that some of these cultural, economic, or other characteristics help to explain rural/urban differences in crime rates. For example, rural residents tend to share more traditional, conservative attitudes and values than those in urban areas. If this is also associated with lower crime rates, it could account for the patterns of crime rates in rural and urban places.

Opportunity theories may also be useful for explaining differences in crime rates between urban and rural places. Routine activities theory suggests that crime occurs when there is a convergence of a motivated offender, a suitable target, and a lack of capable guardians (Cohen and Felson 1979). The smaller population in rural areas may reduce the number of suitable targets of both violent and property crime, while the higher rates of rural poverty may further increase suitable targets for property crime. Also, to the extent that the smaller population in rural areas decreases anonymity among residents, it may also increase guardianship. These differences in opportunity could help to account for rural/urban differences in crime rates.

To take a very different perspective, disparities in crime rates between urban and rural places may stem from differences in police reporting and practices. I try to minimize this by focusing on crimes reported to the police, to avoid bias from variation in police responses to

crime. I also exclude rape, which is known to be under-reported in rural places. However, if there is a systematic bias in reporting, for example, if rural residents are less likely to report crimes to the police, perhaps because they are more likely to deal with matters privately, then this could be the source of some of the differences between rural and urban crime rates.

Overall, this dissertation makes several contributions to the literature on rural crime and social disorganization. I specify how crime rates vary across numerous dimensions of rural/urban location. These measures of rurality improve on prior studies with less detailed measures and the current (2000), nationwide data bring this research up to date. More notably, I explore the role of social disorganization for predicting rural crime rates. I find that social disorganization theory can be extended to rural crime and that controlling for social disorganization reduces the differences between rural and urban crime rates. In addition, I identify some differences in the effects of measures of social disorganization between rural and urban places, particularly in the effect of poverty, which does not predict higher crime rates in rural places. I advise further research to better specify this relationship and to reconcile these findings with social disorganization theory. In conclusion, this study provides an important test of social disorganization theory across rural and urban counties.

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LAINE O'NEILL BRIDDELL – VITA

Assistant Professor of Sociology and Criminal Justice
Department of Sociology and Anthropology
28 Westhampton Way
University of Richmond, VA 23173

Office: 804-287-6430
Cell: 757-620-4828
Email: lbriddell@richmond.edu

EDUCATION

- 2009 Ph.D. in Sociology, Pennsylvania State University
Dissertation: *Rurality and Crime: Identifying and Explaining Rural/Urban Differences*
Committee: D. Wayne Osgood (chair), Eric Silver, Jeremy Staff, Diane McLaughlin
- 2005 M.A. in Crime, Law, and Justice, Pennsylvania State University
Thesis: *Explaining Urban/Rural Differences in Rates of Substance Use Among Adolescents*
Committee: D. Wayne Osgood (chair), Jeremy Staff, Jeffery Ulmer
- 2001 B.A. in Sociology, with High Honors, The College of William and Mary
Thesis: *"Boots and Braces Don't Make a Racist" A Study of the Skinhead Subculture*

RESEARCH INTERESTS

Crime and Delinquency, Rural Sociology, Life Course and the Transition to Adulthood, Quantitative Methods

PUBLICATIONS

- Osgood, D. Wayne, and Laine O'Neill Briddell. 2006. "Peer Effects in Juvenile Justice." In *Deviant Peer Influences in Programs for Youth: Problems and Solutions*, K. Dodge, T. Dishion, and J. Lansford, Eds., p. 141-161. New York: Guilford Press.
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- Staff, Jeremy, Ricardo Sabates, Angel L. Harris, and Laine Briddell. "Uncertain Ambitions: Role Exploration or Floundering?" Revise and resubmit at *Social Forces*.
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