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## **Variants of Social Disorganization: A Comparison of Community Characteristic Measures on Crime Between Urban and Rural Counties in the United States**

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**Variants of Social Disorganization: A Comparison of Community Characteristic Measures on Crime Between Urban and Rural Counties in the United States**

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## INTRODUCTION

There is a well-developed body of criminological research that examines the effect of neighborhood disadvantage on crime through the social disorganization framework. According to this framework, crime rates tend to be higher in neighborhoods with conflicting values and morals due to the inability of the neighborhood to regulate the conduct of its own residents (Weisburd, Groff, and Yang 2014; Bruinsma, Pauwels, and Weerman 2013; Sampson and Groves 1989). Social disorganization contributes to the breakdown of normative consensus through the weakening of *collective efficacy*, defined as the willingness of residents within the community to intervene for the collective good of its members (Sampson et al. 1997). The full social disorganization model suggests that the weakening of collective efficacy is correlated to the weakening of a community's informal social control. Contemporary studies in the social disorganization literature have previously examined variance in factors such as residential mobility, racial heterogeneity, socio-economic status, educational attainment, single mother households, and employment (Berg et al., 2012; Lee and Bartkowski, 2004; Rice and Smith, 2002). In particular, these factors have been heavily studied in their relation to variance in crime rates across urban and metropolitan neighborhoods and communities.

Although existing research on social disorganization has historically been studied to explain crime rates in urban areas, there is a growing interest in the past couple decades advocating for the application of the framework in rural neighborhoods and communities (Bouffard and Muftić 2006; Osgood and Chambers 2000; Petee and Kowalski 1993). As previously discussed, studies have found that measures of social disorganization such as low socioeconomic status or high rates of residential mobility have consistently been found to be significantly associated with higher crime rates. However, most studies fail to examine this association across rural and urban

areas in a comparative model. This is a significant distinction in understanding how the social disorganization framework relates to differences in social structure and opportunities for crime across different types of communities. A study by Goodson and Bouffard (2017) addresses this gap in the existing research by studying the association between social disorganization and different types of assault in both urban and rural counties across the U.S. While seminal research in the context of broadening the social disorganization framework and the study of rural criminology as a whole, this study is limited by the focus of only examining the association between social disorganization and assault, rather than the broad spectrum of different crime types. Similarly, previous studies limit the scope of the body of research by continuing to focus on specific types of crime or in small sample geographies, rather than expanding the scope to examine a broader diversity of crime types (Gillespie 2017; Chilenski, Syvertsen, and Greenberg 2015; Edwards 2015; Lanier and Maume 2009). Understanding how the relationship between social disorganization and the full range of different crime types differ across a national sample of both urban and rural communities contributes to the social disorganization framework regarding generalizability.

The present study aims to fill this gap in existing research by examining the association of conventional measures of social disorganization on crime rates within- and between- urban and rural communities in 2014, thus providing a comprehensive comparison review of the social disorganization framework. Crime data was obtained from the Federal Bureau of Investigation's (FBI) 2014 Uniform Crime Report (UCR) and estimates of community measures of social disorganization was obtained from the U.S. Census Bureau's American Community Survey (ACS). Crime categories identified for this study were distinct according to the UCR Index I crime and includes seven (7) crime types used as the outcome measures: homicide, rape,

robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft. Given the broad scope and limitation of the available data, urban and rural communities will be operationalized as urban and rural counties according to population size and will follow the classification of counties on a geographic spectrum established by the Economic Research Service (2013) of the U.S. Department of Agriculture. Findings suggest variance in the association between conventional measures of social disorganization on different crime types both within- and between- urban and rural counties. This is to suggest the application of the social disorganization framework is highly specific, and although conventional measures of social disorganization are strongly associated with higher rates of crime, the association is not consistently found across counties.

## SCOPE OF SOCIAL DISORGANIZATION THEORY

The key mechanism of social disorganization theory is not the relationship between crime and the exogenous community characteristics. Rather, it is how these characteristics contribute to the breakdown of shared norms and values, and how this is reflected in the weakening of *collective efficacy*. As previously discussed, *collective efficacy* is defined as the willingness of residents within the community to intervene for the collective good of its members (Sampson et al. 1997). This suggests communities with high collective efficacy, as measured by characteristics of neighborhood disadvantage, are less likely to experience high crime rates because residents within the community are more willing to intervene and prevent crime through informal social control. Although there is an extensive body of research that have utilized neighborhood-level data of urban areas to examine how measures of social disorganization are associated with crime rates, less is known about rural communities. In the subsequent sections, I will provide a broad summary of social disorganization theory, previous applications to macro-level geographies, the fundamental differences between urban and rural settings, and existing arguments advocating for the study of social disorganization in rural communities.

### *Theoretical Framework*

The extent of criminological research on community characteristics and crime reflects the social disorganization framework proposed by Shaw and McKay (1942), who studied the association between neighborhood factors and juvenile delinquency rates across inner-city Chicago neighborhoods. In their classic work, *Juvenile Delinquency and Urban Areas*, Shaw and McKay identified three unique community characteristics in particular—high residential mobility, low socio-economic status, and high concentration of cultural heterogeneity—were significantly correlated with crime concentration in geographic areas proximate to downtown

businesses and commercial districts (Park and Burgess 1925; Shaw and McKay 1942). The concentration of these three risk factors contributed to the high turnover of residents in the corresponding neighborhoods. Consequently, these neighborhoods had a greater likelihood of crime due to the inability of the neighborhood to regulate the conduct of its own residents and contributed to the overall breakdown in normative consensus (Sampson and Groves 1989; Shaw and McKay 1942).

According to the social disorganization framework, low socio-economic status (i.e., poverty) is largely considered the most significant factor given its association with social disinvestment and lack of community organization (i.e., informal social controls) to regulate against crime (Bursik 1988; Sampson, Raudenbush, and Earls 1997; Pratt and Cullen 2005; Rice and Smith 2002). Likewise, communities with high residential mobility interferes with forming social relationships necessary for collective efficacy to form overtime. Immediate changes in residency labels the community as transient and socially disorganized, and existing residents are less willing to intervene if neighbors are quick to relocate (Bruce et al. 1998; Cullen and Levitt 1999; Hipp et al. 2009; Liska and Bellair 1995; Marshall 1979; Morenoff and Sampson 1997; Skogan 1990; Xie and McDowall 2008). Finally, cultural heterogeneity refers to the probability of members of different ethnicities living in the same neighborhood, suggesting greater likelihood of conflicting and competing values regarding the appropriateness of illicit conduct (Berg et al. 2012). According to the social disorganization framework, high cultural heterogeneity may interfere with establishing collective efficacy in neighborhoods when residents may not share the same values, thus restricting social control.

Subsequent studies have broadened the understanding of social disorganization to include proxy measures of community characteristics that directly affect collective efficacy, and

consequently, higher concentration of crime rates. Additional factors such as educational attainment has also been identified as a significant factor in the social disorganization framework given neighborhoods with lower levels of education are considered strong indicators of neighborhood deprivation and lower median income (Chainey 2008; Piza et al. 2016). Population density may also be significantly associated to crime by interfering with intimate informal social control, increasing the potential for social interaction, and thus, increasing opportunities for offending (Hipp and Roussell 2013; Osgood and Chambers 2000; Sampson 1983). Furthermore, factors such as single-parent households or population of residents on public assistance have been used in existing studies as proxy measures further capturing the construct of neighborhood socio-economic status (Chamberline and Hipp 2015; Piza et al. 2016).

Social disorganization has traditionally been used to examine the association between neighborhood-level characteristics and crime rates across urban areas at the micro-geographic level. Although one of the most significant challenge of social disorganization studies is to operationalize “neighborhoods and communities”, the vast majority of existing studies have examined neighborhood-level characteristics and crime at the census tract level (Hipp 2007; Piza et al. 2016). Census tracts are pre-defined administrative areas classified by the U.S. Census Bureau and are commonly used in the body of criminological research as proxies for neighborhoods (Piza et al. 2016). There is a growing body of interest in broadening the application of social disorganization theory to examine neighborhood characteristics and crime at the macro-level, in particular, cities and counties (Osgood and Chambers 2000; Chamberlain and Hipp 2015). Furthermore, the foundational framework of social disorganization theory has historically been almost exclusively studied in urban areas. However, recent research is beginning to broaden the scope of the social disorganization framework to examine other types

of communities. As Osgood and Chambers (2000) says in regard to a closer examination of social disorganization effect on crime: “*if the study of communities and crime is to mature, it must expand to encompass the full variety of communities*” (pg. 82).

### *Urban and Rural Settings*

Empirical evidence suggests a fundamental difference in community structure, as well as crime rates, between urban and rural communities. According to Barnett and Mencken (2002), between 1991 and 1997, crime rates in the United States decreased about 22%, and this trend is widely observed and acknowledged in the field of criminology (Baumer and Wolff 2014). However, violent crime increased by about 4% in nonmetropolitan counties during the same period (Barnett and Mencken 2002). Lee and Bartowski (2004) found that religiosity and community civic engagement are inversely associated with juvenile homicide rates in rural settings but had no effect on juvenile homicide in urban areas. This suggests that social dynamics are fundamentally different between rural and urban communities, and this difference may be associated with variation in crime between urban and rural settings.

### *Rural Social Disorganization and Crime*

The few studies that have empirically tested social disorganization theory in rural, non-metropolitan settings have consistently found that some neighborhood factors indicative of social disorganization are statistically significant predictors of crime. In their study, Petee and Kowalski (1993) found residential mobility, percent of single parent households, and racial heterogeneity were all positively associated with higher rates of robbery and aggravated assault in rural counties. Similarly, Osgood and Chambers (2000) found residential instability, ethnic heterogeneity, female-headed households, and population density positively associated with juvenile arrests in non-metropolitan counties. Bouffard and Muftic (2006) also found residential

instability, single-parent household, low socio-economic status, and ethnic heterogeneity positively related to rates of assaults at the aggregate and disaggregate-level of types of assault in non-metropolitan counties. Finally, Lee, Maume, and Ousey (2003) found residential mobility and percent divorced positively associated with homicide in rural communities. It is clear there exists a substantial body of research that supports the consistent positive association between a subset of community characteristics and crime rates in rural and urban settings. Conversely, there exist competing studies advocating greater variance in this association between different types of communities, suggesting the social disorganization framework is not generalizable.

Competing studies predominantly argue the variance in how crime is reported is fundamentally different between rural and urban communities, thus contributing to a skewed outcome of crime trends. In a 2004 study, Barclay, Donnermeyer, and Jobes found attitudes associated with victim blaming tends to be high in rural communities, and/or police do not follow up for fear of disrupting the cohesion of the small community (Barclay, Donnermeyer, and Jobes 2004). This suggests that informal intervention towards delinquent behavior dominates rural communities, rather than formal intervention from law enforcement in urban communities. Regardless of whether rural communities have less crime or simply less reported crime, the pervasiveness of informal intervention reinforces the fundamental difference between rural and urban communities. This fundamental difference in social dynamic between inhabitants is the underlying rationale for this paper. Social disorganization has been found to be less predictive of crime patterns in rural counties than urban counties. Wells and Weisheit (2004) found evidence to suggest ecological (e.g., urban density, housing instability, and population change) and structural (e.g., socio-economic status and employment rate) factors adequately predicted urban patterns of crime, but these variables were less predictive of crime in rural counties.

Considerable inconsistencies remain in the relationships between community characteristics of social disorganization and crime. Lee, Maume, and Ousey (2003) were the first to coin the term “*urban bias*”, which refers to the structural bias of criminological research to only focus on urban and metropolitan settings. In compensating for this limitation in the existing body of research, Lee et al. (2003) found evidence to suggest that socioeconomic disadvantage and poverty concentration were not equally related to homicide rates between urban and rural counties. Additionally, measures of low socio-economic status have yielded mixed findings in the existing social disorganization in rural settings literature. Osgood and Chambers (2000), Petee and Kowalski (1993), and Lee, Maume, and Ousey (2003) found poverty, percent low income, and poverty concentration were not significantly related to various measures of violence in rural counties. In contrast, Barnett and Mencken’s (2002) finding that resource disadvantage has a positive association with violent crime is consistent with the urban literature. In Kaylen and Pridemore’s study (2013), researchers found ethnic heterogeneity and residential mobility were not significant in predicting crime victimization rates, when accounting for social organization interaction (density of local friendship networks, problematic peer groups, and civic engagement). There is something inherently different between urban and rural communities. This may be due to different mechanisms of informal social control and social support in order to compensate for social disorganization characteristics between urban and rural communities.

This is to say that the existing body of empirical research on social disorganization in rural settings is inconclusive and mixed, despite a growing interest in the topic. This may be attributed to unavailability of appropriate data, the ambiguous classification of non-metropolitan communities, or strict within-group comparisons of crime rates in rural settings. The present study builds on the existing literature by examining the effect of social structural variables across

urban and rural counties in the United States concurrently to properly understand differences between urban and rural settings.

## **THE CURRENT STUDY**

The present study examines the relationship between community characteristics of social disorganization and reported crime counts between urban and rural counties in 2014. Two research questions are addressed. First, this study seeks to determine whether the same characteristics of social disorganization are significant predictors of crime across both county types, or are there differences in which measures are related to crime. According to previous literature, social disorganization has been found to manifest differently in the form of informal social control between urban and rural communities (Lee, Maume, and Ousey 2003). Thus, different characteristics of social disorganization are expected to be significant predictors of crime across the two county types. The second research question refers to the difference in the effect size of social disorganization predictors on different crime types. This study seeks to determine if the same characteristics of social disorganization account for similar effect sizes in predicting different types of crime across urban and rural counties. For this study, effect size will be examined through the incidence rate ratio, or IRR, which measures the rate of which the outcome measure is expected to change following a one-unit increase in the independent variable of interest. Comparison of the IRR between rural and urban counties allows for a standardized examination of how conventional variables of social disorganization affect crime between two different units of analysis.

Previous studies argue that social disorganization factors are most appropriate at predicting street-level crimes (i.e., robbery and aggravated assault), but such crimes are more common in urban settings (Sampson and Groves 1989; Kawachi, Kennedy, and Wilkinson 1999; Smith, Frazee, and Davison 2000). In line with this understanding, community characteristics are expected to have smaller effect sizes predicting robbery and aggravated assault in rural counties

compared to urban counties. Finally, residential mobility is also expected to be significantly associated with all types of crime but will have the highest effect size in urban counties compared to rural counties. This hypothesis is prompted by previous research which argue the fundamental measures of social disorganization are strongly associated with the degree of residential mobility (i.e., the degree of transition between residents in which disrupts the continuity and networks in the community).

### *Study Setting*

The current study examines the difference in the predictive nature of social disorganization covariates on official reported crime counts between urban and rural counties in the United States. There is a precedent in the existing rural criminology literature advocating for the focus on counties in this theoretical framework (Goodson and Bouffard 2017; Donnermeyer 2015; Lee and Bartowski 2004; Lee 2008; Baller et al. 2001; Osgood and Chambers 2000). In addition, Osgood and Chambers (2000) argue one of the principal weakness of community-level research on crime is that most study exclusively on neighborhoods within a single metropolitan area. This limits any claims for generalizing results and provides no means for resolving inconsistencies in findings across studies of different locations. In this vein, the focus of multiple counties across five different States in the present study provides a basis for generalizability. The classification of macro-level units of analysis, such as counties, has historically been a point of inconsistency in the existing rural criminology literature. However, as Packer, McCall, and Land (1999) and Land, McCall, and Cohen (1990) assert, the selection of macro-level units of analysis in community characteristic research is inherently arbitrary because there tends to be convergence in findings across studies employing various units of analysis.

The present study will adhere to the Economic Research Service (2013) of the U.S. Department of Agriculture categorization of counties on a geographic spectrum. On one end of the spectrum, counties are classified as metropolitan (i.e., urban) if residential population is 50,000 or more, and the geographic area is economically tied to another urban county. This 50,000 or more population size criteria is consistent with county classification established in existing empirical research (Goodson and Bouffard 2017; Osgood and Chambers 2000). Counties are classified as nonmetropolitan (i.e., rural) if residential population is fewer than 2,500, if residential population is in range from 2,500 to 49,999 and are not tied to larger labor market areas (i.e., metropolitan areas associated with large commercial markets), or counties identified with open countryside (ERS 2013). The continuum codes include nine different categories where categories 1 to 3 classify a county as metropolitan and categories 4 to 9 classify a county as nonmetropolitan. For the present study, classification codes were aggregated and counties were coded as a dichotomous variable (“0”= Urban County, “1”= Rural County).

### *Sample*

The present study includes 3,136 rural and urban counties from the United States with reported crime and community characteristics variables. The purpose of this study is to compare the significance and effect size of traditional measures of social disorganization in explaining crime between urban and rural counties, so the sample must include proper representation of urban and rural counties from each State. Counties located in Delaware, New Jersey, and Rhode Island, as well as Washington D.C., are only classified as urban counties, and so were dropped from the sample. Given there are more “rural” counties than “urban” counties in the United States according to the ERS, 60% of classified rural counties were randomly selected to be in the final sample, as well as all classified urban counties. Thus, the sample for this study is

representative of an equal distribution of rural and urban counties across the country, eliminating sample bias by having a larger population of rural counties compared to urban counties. The distribution of counties by State for this sample is presented in Table 1.

[Insert Table 1 here]

A total of 2,318 counties from 46 States were selected as the sample for the analysis. In this sample, 1,136 counties (49.01%) are classified as “urban” and 1,182 counties are classified as “rural” (32.2%).

#### *Identifying Dependent Outcome Variables*

Crime data for the present study is collected from the 2014 version of the Federal Bureau of Investigation’s (FBI) Uniformed Crime Report (UCR) and accessed from the Inter-University Consortium on Political and Social Research (ICPSR Study #36399; U.S. Department of Justice 2014). Crime data may be disaggregated into different classifications of crime such as *Part I*, which consists of violent crimes (i.e., murder and non-negligent, forcible rape, robbery, and aggravated assault) and property crime (i.e., burglary, larceny-theft, and motor vehicle theft), and *Part II*, which consists of all other crimes not identified within the *Index I* definitions (FBI 2014). For the present study, only *Part I* crimes are analyzed. Aggregate and disaggregate counts of reported *Index I* violent and property crime according to the UCR classification are taken. Arson was dropped from the final models given the inconsistency in reporting and official definition between jurisdictions. Summary statistics of the 9 different types of crime are presented in Table 2.

[Insert Table 2 here]

Aggregate and disaggregate *Part I* crimes are analyzed in order to capture the full range of effect social disorganization measures has on explaining different types of crimes across different types of counties. In total, nine dependent variables are created for the analysis including violent crime, homicide, rape, robbery, aggravated assault, property crime, burglary, larceny-theft, and motor vehicle theft.

#### *Identifying Independent Social Disorganization Variables*

The present study will utilize county-level estimates for 2014 provided by the United States Census Bureau's American Community Survey (ACS). Data in the ACS include a wide range of community characteristic estimates such as socioeconomic status, demographics, and educational attainment at various geographic units of analysis. Similar to the UCR, data provided by the ACS is arguably the most utilized secondary dataset in the field of criminology with regards to examining neighborhood factors as indicators of social disorganization. Community characteristics at the county-level were obtained from the 2014 ACS and used to measure traditional variables of social disorganization such as low socioeconomic status, residential instability (i.e., mobility), family disruption, and ethnic heterogeneity. Summary statistics of community characteristics across different county types are presented in Table 2.

In the present study, socioeconomic status variables include the measures percentage of eligible population declared below poverty status, unemployment rate of eligible labor force (16 years and over), and percentage of total population with public assistance or food stamps/SNAP (Goodson and Bouffard 2017; Kaylen and Pridemore 2013; Van Wyk, Benson, Fox, and DeMaris 2003; Lee, Maume, and Ousey 2003; Osgood and Chambers 2000). In line with existing research, each of these measures are analyzed as separate variables (Klein, Allison, and Harris 2017; Kaylen and Pridemore 2013; Osgood and Chambers 2000). This also allows for the

present study to capture the nuance in how different measures of social disorganization predict crime occurrence separately.

Sociodemographic variables examined in the analysis include residential instability, single-mother households, and ethnic heterogeneity. Residential instability is measured as the percentage of individuals who moved into the county from a different residence within the previous year (Goodson and Bouffard 2017; Bruinsma, Pauwels, Weerman, and Bernasco 2013; Kaylen and Pridemore 2013b; Bouffard and Muftic 2006). Single-mother households is measured as the percentage of single-mother families in relation to the number of families with children younger than 18 years old (Goodson and Bouffard 2017; Bouffard and Muftic 2006; Lee and Bartkowski 2004; Osgood and Chambers 2000). A diversity index was calculated to measure ethnic heterogeneity. The original categories of race included White, Black, American Indian, Asian, Pacific Islander, and Other. However, to create enough variability for the diversity index, race was recoded and categorized into groups in terms of the proportion of White versus non-Whites in each county (Bouffard and Muftic 2006; Van Wyk, Benson, Fox, and DeMaris 2003, Osgood and Chambers 2000). In line with previous scholars (e.g., Bouffard and Muftic 2006; Osgood and Chambers 2000; Sampson and Groves 1989), the diversity index was calculated as, “ $1-(\sum p_i^2)$ , where  $p_i$  is the proportion of individuals of a given ethnic group, which is squared and summed across the groups that are distinguished (e.g., Whites and non-Whites). This index reflects the probability that two randomly drawn individuals would differ in ethnicity” (Osgood & Chambers 2000, pg. 93). Scores on the diversity index ranged from 0.00 to 0.50, with higher scores reflecting greater diversity within a county. Donnermeyer (2015) suggests significant variance in community characteristics between rural and urban settings is expected, specifically

for economic variables. This reinforces the notion that social disorganization is not a “one-size-fits-all” theory applicable to settings beyond the metropolitan areas.

### *Analytic Plan*

The current study ran three sets of negative binomial regression models. This analytic technique was selected given the dependent variable of interest (crime reported across different county types) are operationalized as count data. According to Osgood and Chambers (2000), poisson-based and negative binomial regression models are most appropriate when using count data, and particularly useful for analyses involving low counts and small populations. Crime rates in areas with small populations, as is the case in rural counties, have a tendency to be less precise and the analysis skewed relative to higher populated, urban counties.

The final regression models include the natural log of the population as an offset variable with a fixed coefficient of 1. In doing so, the skewed distributions of crime counts are standardized relative to the size of the population of a given geography, and thus addresses the problem of error variance and allows for more precision within the analyses (Osgood and Chambers 2000). This technique is consistent with previous research examining crime count data in geographies with small populations such as rural counties (Goodson and Bouffard 2017; Osgood and Chambers 2000). Additional post-hoc test of goodness-of-fit reveal that given the distribution of crime in both rural and urban counties, the negative binomial regression iteration is the best fitting model for the analysis compared to poisson-based regression<sup>1</sup>.

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<sup>1</sup> Linear regression model transformations showed that any transformation of crime counts into crime rates violated the model’s assumption of normal distribution according to the Shapiro-Wilk Normality Test for distribution of the dependent variable

## RESULTS

The purpose of this study is to examine the relationship between community characteristics of social disorganization and reported crime between urban and rural counties in 2014. Three sets of negative binomial regression models are run: a baseline social disorganization model for crime in all counties, a control model for urban-rural county classification, and split sample models consisting of crime in urban counties vs. rural counties.

### *Social Disorganization and Crime*

Tables 3 and 4 shows the results from the first negative binomial regression model examining the effect of social disorganization on violent crime and property crime respectively, across all county types.

[Insert Table 3 here]

[Insert Table 4 here]

According to the results, measures of social disorganization are found to be significantly, positively related to all types of crime, particularly robbery. In fact, variables such as county ethnic diversity and single-mother households are found to be the strongest predictors. This is the estimated rate ratio for a one-unit increase; thus a one-unit increase in a county ethnic diversity index and single-mother household suggests an increase in robbery by a factor of 1.79 and 1.58 respectively.

Interestingly, the different measures of socioeconomic status that are traditionally examined as an aggregate index, including unemployment rate, poverty status, and public assistance, are found to have different effects on different crime types. For example, unemployment status is found to be negatively related to rape while poverty status and public assistance are found to be positively related, poverty status is significantly negatively related to the aggregate of property

crimes, and public assistance is positively related to all crime types, but this relationship is not significant for aggravated assault or burglary.

It is clear that not all measures of social disorganization are significantly related, but rather certain measures are related to certain types of crime. This is consistent in existing social disorganization research, which has seen an increase in specific outcomes in recent years (Goodson and Bouffard 2017; Gillespie 2017; Edwards 2015; Lanier and Maume 2009), and further suggest the lack of generalizability in the social disorganization-crime link.

Overall, social disorganization found to be stronger predictors of violent crime compared to property crime, in particular homicide and robbery, with about 7% of variance in both crime types explained by the measures of social disorganization introduced in this study. In contrast, less than 2% of variance in the aggregate property crime are explained by the same measures of social disorganization.

#### *Social Disorganization and Crime Between County Types*

*Tables 5 and 6* shows the results from the second negative binomial regression model examining the effect of social disorganization on violent crime and property crime respectively, controlling for county type.

[Insert Table 5 here]

[Insert Table 6 here]

Across all crime types, rural/non-metropolitan counties reported less crime than urban/metropolitan counties. In particular, the biggest distinction is in robbery with urban counties reporting more than 2.31 times more robbery events than rural counties. Consistent with the previous model, not all measures of social disorganization are significantly related, but rather

certain measures are related to certain types of crime, but single mother household and ethnic heterogeneity still significantly positively related to all crime types.

#### *Social Disorganization and Crime Within Urban Counties*

Tables 7 and 8 shows the negative binomial regression model examining the effect of social disorganization on violent crime and property crime respectively, in urban counties.

[Insert Table 7 here]

[Insert Table 8 here]

Traditional measures of social disorganization seem to be significantly related to crime in urban counties, but this appears to differ based on the type of crime and which social disorganization measure. Social disorganization measures such as poverty status and ethnic heterogeneity are significantly, positively related to all types of crime, while other traditional measures such as unemployment rate seem to be significantly, negatively related to only rape and larceny-theft. Similar to the baseline model, county ethnic heterogeneity and single-mother households are found to be consistently significantly positively related to all types of crime in urban counties.

Once again, social disorganization found to be stronger predictors of violent crime compared to property crime, in particular homicide and robbery, with about 9% and 7% of variance explained respectively by the measures of social disorganization introduced in this study. In contrast, only 2% of variance in the aggregate property crime are explained by the same measures of social disorganization.

#### *Social Disorganization and Crime Within Rural Counties*

Tables 9 and 10 shows the negative binomial regression model examining the effect of social disorganization on violent crime and property crime respectively, in rural counties.

*[Insert Table 9 here]*

*[Insert Table 10 here]*

Although each model appears to be statistically significant for rural counties, measures of social disorganization appear to only account for about 1% of variance in reported aggregate property crime type, and only as high as 2% of variance for burglary. Overall, there is little difference in the effect of traditional measures of social disorganization on property crime between urban and rural counties. However, it is clear from the results that the measures of social disorganization are stronger predictors of violent crime in urban counties compared to rural counties. According to the results, measures of social disorganization only explains 2% of variance in aggregate violent crime in rural counties, compared to 4% of variance in aggregate violent crime in urban counties. Previous studies also argue that social disorganization factors are most appropriate at predicting street-level crimes (i.e., robbery and aggravated assault), but such crimes are more common in urban settings (Sampson and Groves 1989; Kawachi, Kennedy, and Wilkinson 1999; Smith, Frazee, and Davison 2000). Results suggests that traditional measures of social disorganization are strongest predictors of reported homicide and robbery across both county types.

## CONCLUSION

Existing research of social disorganization theory overwhelmingly focuses on the influence of community characteristics on crime in urban or metropolitan settings. Contemporary studies in the field have broadened to examine the relationship community characteristics of disorganization has on alternative outcomes such as interpersonal relationships across the life-course, group-centered behaviors, or the specific relationship to different types of crimes (Smith, Gomez, and Ferguson 2018; Kawalerowicz and Biggs 2015; Goodson and Bouffard 2017). Previous studies expanding social disorganization theory in the rural context have been important in highlighting distinct differences in community structure and how they manifest between urban and rural settings. Furthermore, these studies argue differences observed suggest the traditional measures under the social disorganization framework are not generalizable to explaining crime in the rural context. However, as far as the author can tell, no existing study provides a comparative model in testing the influence of traditional measures of social disorganization on all types of crime between urban and rural settings.

The present study bridges this gap by providing a holistic comparative study examining the influence and strength of relationship of different measures of social disorganization on different types of crime between a national sample of urban and rural counties. Results observed when comparing crime in urban and rural counties suggest important differences. Overall, unemployment rate and poverty rates were found to be influencing crime in opposite directions and affecting different types of crime across urban and rural county types. In urban counties, unemployment rate is significantly related to crime, but negatively related to the aggregate of violent and property crime, with the strongest effect size found in reported rape. According to the reported incident rate ratios, a one-unit increase in unemployment rate in the sample of urban

counties corresponded to a decrease in reported rape by a factor of 0.84. On the other hand, poverty status and public assistantship consistently has a significant, positive relationship with all types of crime. Conversely, unemployment rate in rural counties is consistently significantly and positively related to all types of crime, but poverty status is found to have more variance in effect on crime and these relationships are not statistically significant.

Surprisingly, residential instability is found to have an inverse effect on street-level crimes in urban counties as seen in previous studies, with increases in residential instability reducing reported robbery in urban counties. In contrast, increases in residential instability was found to increase robbery in rural counties, but decrease the aggregate of reported property crimes in rural counties. Interestingly, social disorganization appears to be a stronger predictor of rape in rural counties compared to urban counties, with a marginal difference on variance explained of reported robberies between urban and rural counties.

Results further suggest there are similar patterns observed as well. Increases in the percentage of county residents on public assistantship, in percentage of single-mother households, and in the diversity of a county increase crime all types of crime across both urban and rural counties. However, it is clear that these measures have the strongest influence and explained variance of crime in urban counties as compared to rural counties. Overall, these results reinforce the difference in community characteristics as predictors of crime in different types of counties. This is vital in the development of community criminological theories such as social disorganization theory.

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## APPENDIX

*Table 1—Distribution of Counties*

<u>STATE</u>	<u>URBAN</u>	<u>RURAL</u>	<u>STATE</u>	<u>URBAN</u>	<u>RURAL</u>
Alabama	29	21	Montana	5	30
Alaska	3	10	Nebraska	13	48
Arizona	8	2	Nevada	4	11
Arkansas	20	34	New Hampshire	3	5
California	37	12	New Mexico	7	16
Colorado	17	28	New York	38	16
Connecticut	7	1	North Carolina	46	31
Florida	44	13	North Dakota	6	28
Georgia	74	54	Ohio	38	29
Hawaii	3	2	Oklahoma	18	36
Idaho	12	13	Oregon	13	18
Illinois	40	41	Pennsylvania	37	20
Indiana	44	34	South Carolina	26	14
Iowa	21	50	South Dakota	8	28
Kansas	19	50	Tennessee	42	35
Kentucky	35	52	Texas	82	96
Louisiana	35	17	Utah	10	11
Maine	5	11	Vermont	3	6
Maryland	19	4	Virginia	80	35
Massachusetts	11	2	Washington	21	10
Michigan	26	34	West Virginia	21	20
Minnesota	27	32	Wisconsin	26	27
Mississippi	17	38	Wyoming	2	11
Missouri	34	46			

**Table 2—Summary Statistics**

	<i>Frequency (%)</i>	<i>M</i>	<i>SD</i>	<i>MIN.</i>	<i>MAX.</i>
<b>Violent Crime</b>		464.83	1,853.54	0	42,725
<i>Homicide</i>		5.52	23.90	0	526
<i>Rape</i>		42.87	125.68	0	2,224
<i>Robbery</i>		129.27	683.52	0	16,191
<i>Aggravated Assault</i>		287.16	1,054.76	0	23,784
<b>Property Crime</b>		3,208.02	10,300.37	0	217,493
<i>Burglary</i>		663.97	2,099.27	0	44,224
<i>Larceny-Theft</i>		2,267.66	7,025.86	0	136,683
<i>Motor Vehicle Theft</i>		276.38	1,336.74	0	36,586
<b>Socioeconomic Status</b>					
<i>Unemployment Rate (16yrs. older)</i>		8.65	3.63	0	29
<i>Poverty Status</i>		16.55	6.47	2.07	52.63
<i>Public Assistance</i>		0.98	0.57	0	5.08
<b>Sociodemographic</b>					
<i>Residential Instability</i>		6.71	3.06	0.20	45.10
<i>Single-Mother Households</i>		6.52	2.43	0	20.38
<i>Ethnic Heterogeneity</i>		0.27	0.15	0	0.50
<b>County Classification</b>					
<i>Urban</i>	1,136 (49.01%)				
<i>Rural</i>	1,182 (50.99%)				

**Table 3—Effect of Neighborhood-Level Factors on Violent Crime**

	<u>Violent Crime</u>		<u>Homicide</u>		<u>Rape</u>		<u>Robbery</u>		<u>Aggravated Assault</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>										
<i>Unemployment Rate (16yrs. older)</i>	1.05	0.023*	1.06	0.036	0.94	0.023*	1.09	0.037*	1.05	0.024
<i>Poverty Status</i>	1.03	0.023	1.19	0.040**	1.01	0.024	0.86	0.027**	1.09	0.026**
<i>Public Assistance</i>	1.05	0.018**	1.06	0.026*	1.12	0.021**	1.13	0.030**	1.03	0.019
<b>Sociodemographic</b>										
<i>Residential Instability</i>	1.00	0.017	0.97	0.024	1.08	0.019**	0.98	0.023	1.00	0.018
<i>Single-Mother Households</i>	1.18	0.025**	1.28	0.042**	1.06	0.026*	1.58	0.051**	1.13	0.027**
<i>Ethnic Heterogeneity</i>	1.29	0.024**	1.35	0.039**	1.06	0.022**	1.79	0.047**	1.27	0.026**
<b>R<sup>2</sup></b>	0.03**		0.07**		0.01**		0.07**		0.02**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.  
p<0.05\*; p<0.01\*\**

**Table 4—Effect of Neighborhood-Level Factors on Property Crime**

	<u>Property Crime</u>		<u>Burglary</u>		<u>Larceny-Theft</u>		<u>Motor Vehicle Theft</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>								
<i>Unemployment Rate (16yrs. older)</i>	1.05	0.023*	1.07	0.022**	1.04	0.024	1.01	0.025
<i>Poverty Status</i>	0.96	0.021	1.11	0.023**	0.92	0.021**	0.98	0.025
<i>Public Assistance</i>	1.05	0.018**	1.03	0.016	1.06	0.019**	1.10	0.021**
<b>Sociodemographic</b>								
<i>Residential Instability</i>	1.03	0.017	0.96	0.015**	1.06	0.018**	1.00	0.020
<i>Single-Mother Households</i>	1.21	0.026**	1.12	0.023**	1.26	0.028**	1.14	0.028**
<i>Ethnic Heterogeneity</i>	1.19	0.022**	1.19	0.021**	1.17	0.023**	1.36	0.028**
<b>R<sup>2</sup></b>	0.01**		0.02**		0.01**		0.02**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.*

*p<0.05\*; p<0.01\*\**

**Table 5—Effect of Neighborhood-Level Factors on Violent Crime Controlling for County Types**

	<u>Violent Crime</u>		<u>Homicide</u>		<u>Rape</u>		<u>Robbery</u>		<u>Aggravated Assault</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>County</b>										
<i>Urban</i>	1.24	0.040**	1.36	0.077**	1.06	0.038	2.31	0.102**	1.15	0.040**
<i>Rural</i>	0.81	0.026**	0.73	0.041**	0.94	0.033	0.43	0.019**	0.87	0.030**
<b>Socioeconomic Status</b>										
<i>Unemployment Rate (16yrs. older)</i>	1.03	0.022	1.05	0.036	0.94	0.023**	1.05	0.032	1.03	0.024
<i>Poverty Status</i>	1.09	0.025**	1.29	0.046**	1.02	0.026	1.05	0.033	1.13	0.029**
<i>Public Assistance</i>	1.06	0.018**	1.06	0.026*	1.12	0.022**	1.13	0.027**	1.03	0.019
<b>Sociodemographic</b>										
<i>Residential Instability</i>	0.99	0.016	0.96	0.024	1.07	0.019**	0.94	0.020**	0.99	0.018
<i>Single-Mother Households</i>	1.15	0.025**	1.23	0.041**	1.05	0.026*	1.43	0.044**	1.11	0.026**
<i>Ethnic Heterogeneity</i>	1.27	0.024**	1.31	0.039**	1.05	0.022*	1.65	0.041**	1.25	0.026**
<b>R<sup>2</sup></b>	0.03**		0.08**		0.01**		0.09**		0.02**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.*

*p*<0.05\*; *p*<0.01\*\*

**Table 6**—Effect of Neighborhood-Level Factors on Property Crime Controlling for County Types

	<u>Property Crime</u>		<u>Burglary</u>		<u>Larceny-Theft</u>		<u>Motor Vehicle Theft</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>County</b>								
<i>Urban</i>	1.28	0.040**	1.15	0.035**	1.30	0.043**	1.46	0.053**
<i>Rural</i>	0.78	0.025**	0.87	0.026**	0.77	0.025**	0.69	0.025**
<b>Socioeconomic Status</b>								
<i>Unemployment Rate (16yrs. older)</i>	1.03	0.022	1.06	0.021**	1.02	0.023	0.97	0.023
<i>Poverty Status</i>	1.03	0.024	1.15	0.026**	0.98	0.024	1.08	0.029**
<i>Public Assistance</i>	1.05	0.017**	1.03	0.016	1.06	0.018**	1.10	0.021**
<b>Sociodemographic</b>								
<i>Residential Instability</i>	1.02	0.017	0.96	0.015**	1.04	0.018*	0.99	0.019
<i>Single-Mother Households</i>	1.17	0.025**	1.09	0.023**	1.21	0.027**	1.08	0.026**
<i>Ethnic Heterogeneity</i>	1.17	0.022**	1.18	0.021**	1.15	0.022**	1.31	0.027**
<b>R<sup>2</sup></b>	0.01**		0.02**		0.01**		0.03**	

*Note.* The natural log of the population was included as an offset variable with the coefficient fixed to 1.

*p*<0.05\*; *p*<0.01\*\*

**Table 7—Effects of Neighborhood-Level Factors on Violent Crime in Urban Counties**

	<u>Violent Crime</u>		<u>Homicide</u>		<u>Rape</u>		<u>Robbery</u>		<u>Aggravated Assault</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>										
<i>Unemployment Rate (16yrs. older)</i>	0.99	0.030	1.02	0.045	0.84	0.028**	0.95	0.041	1.02	0.035
<i>Poverty Status</i>	1.25	0.037**	1.39	0.059**	1.18	0.036**	1.15	0.047**	1.30	0.044**
<i>Public Assistance</i>	1.06	0.024**	1.05	0.031	1.14	0.028**	1.23	0.041**	1.02	0.026
<b>Sociodemographic</b>										
<i>Residential Instability</i>	0.94	0.019**	0.95	0.028	1.05	0.022*	0.92	0.026**	0.93	0.021**
<i>Single-Mother Households</i>	1.14	0.032**	1.33	0.052**	1.09	0.034**	1.36	0.053**	1.09	0.035**
<i>Ethnic Heterogeneity</i>	1.32	0.031**	1.34	0.048**	1.07	0.027**	1.86	0.059**	1.26	0.034**
<b>R<sup>2</sup></b>	0.04**		0.09**		0.01**		0.07**		0.03**	

**Table 8—Effects of Neighborhood-Level Factors on Property Crime in *Urban* Counties**

	<u>Property Crime</u>		<u>Burglary</u>		<u>Larceny-Theft</u>		<u>Motor Vehicle Theft</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>								
<i>Unemployment Rate (16yrs. older)</i>	0.96	0.026	1.04	0.028	0.93	0.027*	0.98	0.036
<i>Poverty Status</i>	1.15	0.031**	1.30	0.035**	1.11	0.031**	1.20	0.044**
<i>Public Assistance</i>	1.05	0.021*	1.02	0.020	1.05	0.022*	1.14	0.030**
<b>Sociodemographic</b>								
<i>Residential Instability</i>	1.01	0.019	0.93	0.017**	1.03	0.020	0.96	0.024
<i>Single-Mother Households</i>	1.15	0.030**	1.11	0.028**	1.17	0.032**	1.11	0.037**
<i>Ethnic Heterogeneity</i>	1.19	0.025**	1.16	0.025**	1.18	0.026**	1.40	0.038**
<b>R<sup>2</sup></b>	0.02**		0.03**		0.01**		0.03**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.*

*p*<0.05\*; *p*<0.01\*\*

**Table 9—Effects of Neighborhood-Level Factors on Violent Crime in Rural Counties**

	<u>Violent Crime</u>		<u>Homicide</u>		<u>Rape</u>		<u>Robbery</u>		<u>Aggravated Assault</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>										
<i>Unemployment Rate (16yrs. older)</i>	1.07	0.032*	1.11	0.064	1.04	0.039	1.15	0.051**	1.06	0.035
<i>Poverty Status</i>	0.99	0.036	1.15	0.078*	0.87	0.037**	0.97	0.049	1.01	0.040
<i>Public Assistance</i>	1.04	0.025	1.04	0.047	1.09	0.032**	1.03	0.037	1.03	0.027
<b>Sociodemographic</b>										
<i>Residential Instability</i>	1.03	0.027	0.94	0.044	1.07	0.034*	0.94	0.033	1.04	0.030
<i>Single-Mother Households</i>	1.14	0.037**	1.06	0.066	1.03	0.041	1.52	0.076**	1.12	0.039**
<i>Ethnic Heterogeneity</i>	1.24	0.036**	1.29	0.068**	1.04	0.036	1.44	0.058**	1.25	0.039**
<b>R<sup>2</sup></b>	0.02**		0.04**		0.004**		0.08**		0.02**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.  
p<0.05\*; p<0.01\*\**

**Table 10—Effects of Neighborhood-Level Factors on Property Crime in Rural Counties**

	<u>Property Crime</u>		<u>Burglary</u>		<u>Larceny-Theft</u>		<u>Motor Vehicle Theft</u>	
	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>	<i>IRR</i>	<i>S.E.</i>
<b>Socioeconomic Status</b>								
<i>Unemployment Rate (16yrs. older)</i>	1.09	0.035*	1.09	0.032**	1.09	0.037	0.99	0.032
<i>Poverty Status</i>	0.94	0.035	1.05	0.037	0.89	0.034**	1.01	0.039
<i>Public Assistance</i>	1.05	0.027	1.02	0.025	1.06	0.028*	1.05	0.027
<b>Sociodemographic</b>								
<i>Residential Instability</i>	1.01	0.027	0.96	0.025	1.03	0.029	1.01	0.029
<i>Single-Mother Households</i>	1.18	0.040**	1.08	0.034*	1.24	0.044**	1.03	0.036
<i>Ethnic Heterogeneity</i>	1.16	0.034**	1.21	0.034**	1.14	0.035**	1.23	0.037**
<b>R<sup>2</sup></b>	0.01**		0.02**		0.01**		0.01**	

*Note. The natural log of the population was included as an offset variable with the coefficient fixed to 1.*

*p*<0.05\*; *p*<0.01\*\*