

Social Disorganization and Rural/Urban Crime Rates: A County Level Comparison of Contributing Factors

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Abstract

Social disorganization theory (Shaw & McKay, 1929) is a common explanation for crime. However, few studies have examined its significance for the explanation of crime in rural areas. The current study utilizes county level data from the United States Department of Health and Human Services to examine common characteristics of social disorganization for both rural and urban areas and which of these factors greater contribute to crime rates. The findings are consistent with previous research that finds significant differences between urban and rural areas regarding causes of crime. Overall, this study found that common measures of social disorganization such as *income*, *racial heterogeneity*, and *migration* do play a significant role in predicting the crime rate for both urban and rural areas. However, *births* and *international migration* play a significant role only in rural areas.

Keywords: social disorganization theory, rural, crime, social control



Most research regarding criminal acts focuses on crime in primarily urban areas (Carrington & Scott, 2008; Deller & Deller, 2011). Although there has been a recent interest in the study of rural crime, there continues to be a dearth of rural crime research in the criminology and criminal justice literature (Wells & Weisheit, 2004). Official rates of crime are higher in cities, catching the attention of researchers more than rural areas. Research has found that there are differences between types of crime in rural and urban areas; specifically, rural communities involve more thefts than violent crimes (Carter, 1982; Deller & Deller, 2011). Fundamental differences may exist between rural and urban communities that may contribute differently to their crime rates. Perhaps the overlooked topic of rural crime is more of a problem than society believes. This paper utilized components of social disorganization theory to compare contributing factors to crime rates in urban and rural counties throughout the United States. If social disorganization holds true in urban areas, could it manifest itself different in rural areas?

Social Disorganization Theory

Park and Burgess (1925) established the function of ecological factors relating to crime. Using the inner city as the center of the model and suburban neighborhoods as the outer most zone, Park and Burgess (1925) described crime rates corresponding to each characteristically different zone. The zone of transition, the area directly outside the inner city characterized by higher levels of poverty, racially heterogeneous neighborhoods, and poorly kept residencies; suffers from anomie and the erosion of cohesive normative values (Shaw & McKay, 1929). As a result of anomie, crime occurs more frequently. Results from Shaw and McKay's (1929) study of delinquent youth were consistent among all observed ethnic groups, indicating that community dynamics and structural conditions yield high levels of social disorganization, which leads to crime. Social disorganization theory was widely abandoned during the 1950's after facing criticism that the theory was too unique to the characteristics of Chicago (Wells & Weisheit, 2012). Examining the efficacy of social disorganization through a meta-analysis, Pratt and Cullen (2005) found support for the following variables: socioeconomic status, urbanism, racial heterogeneity, residential mobility, family disruption, unsupervised local peer groups, and collective efficacy.

Robert Bursik and Robert Sampson re-conceptualized social disorganization during the 1980's. In Sampson's (1987, 2002) view, social disorganization occurs when there is a low level of collective efficacy present. Bursik (1988, 1999) formulated social organization around the cohesiveness of a community based on social ties. In rural communities, the social networks based on the familiarity of residents may be especially important. Expressing this sentiment, Lee (2006) set forth the civic engagement hypothesis relating to informal social control in rural communities. Lee (2006) found the informal social control produced from religiosity of a community was associated with a decrease in crime. An important distinction exists between social disorganization and civic engagement, however. While civic engagement emphasizes the

salience of informal social control, social disorganization focuses on the factors that lead to a breakdown of normative values in a community.

What is Rural?

One key component in rural crime research is the definition of rural. Typically, urban and metropolitan areas are identified and defined by specific criteria, with rural and non-metro areas being identified by failing to meet these specific criteria. The U.S. Census Bureau identifies rural areas as open country or settlements with fewer than 2,500 people (Cromartie, 2007). The Department of Agriculture goes further to identify counties on a continuum of rural and urban based on county population and proximity to metropolitan areas where commuting and economic stability is based in these metropolitan areas. This classification ranges on a 9-point scale from counties in metro areas of 1 million or more to completely rural or less than 2,500 urban populations, not adjacent to a metro area (Parker, 2013). Table 1 and Figure 1, adapted from Parker (2013), display the breakdown of county populations by county Beale codes. Of the 308,745,538 U.S. citizens identified from the 2010 census, 46,293,406 lived in non-metro counties (Parker, 2013); meaning that almost 15% of American’s live in non-metro areas.

Table 1: 2013 U.S. Population Based on ERS Rural-Urban County Continuum Codes

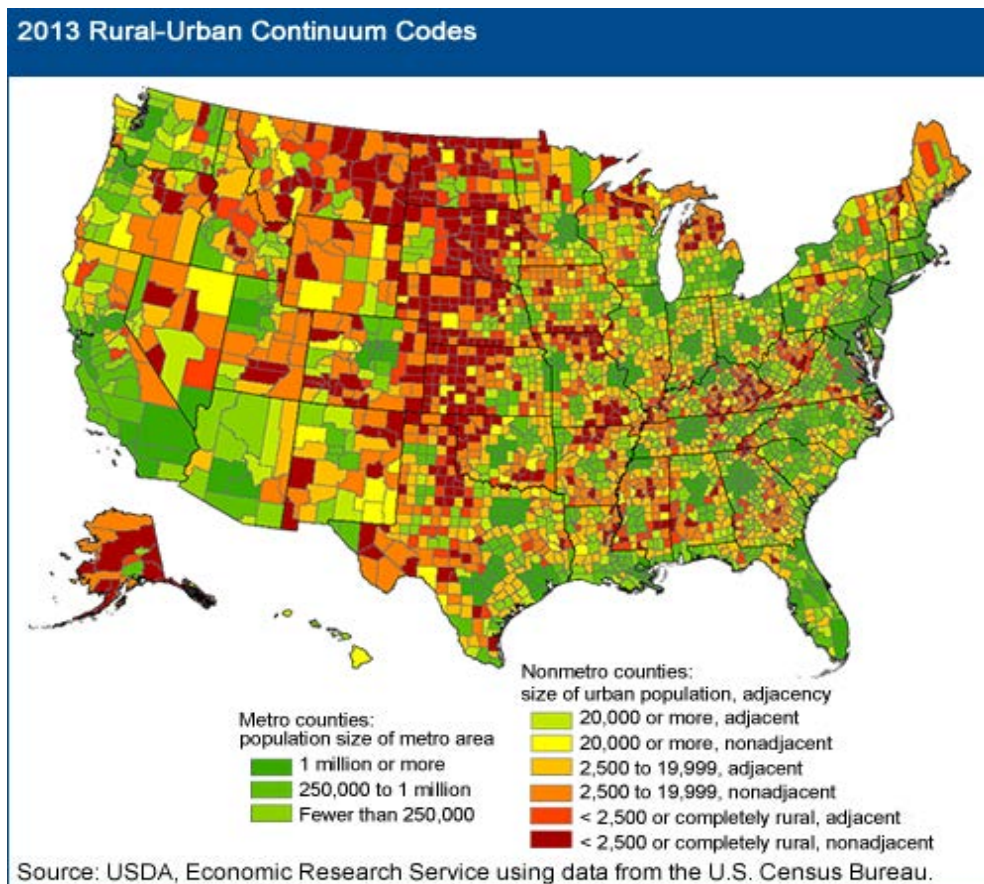
Code	Number of Counties	2010 Population
Metro	1,167	262,452,132
1: 1 million or more	432	168,523,961
2: 250,000 to 1 million	379	65,609,956
3: Fewer than 250,000	356	28,318,215
Non-Metro	1,976	46,295,406
4: urban pop. of 20,000 or more, adjacent	214	13,538,322
5: urban pop. of 20,00 or more, nonadjacent	92	4,953,810
6: urban pop. of 2,500 to 19,999, adjacent	593	14,784,976
7: urban pop. of 2,500 to 19,999, nonadjacent	433	8,248,674
8: urban pop. of < 2,500 or completely rural, adjacent	220	2,157,448
9: urban pop. of < 2,500 or completely rural, nonadjacent	424	2,610,176
U.S. Total	3,143	308,745,538

Note: Adapted from Parker, 2013.

Beyond measuring rural, rural areas are generally qualitatively different than many urban areas in the fact that they tend to be more homogeneous and are more likely to share similar values (Websdale, 1995). Past scholars have argued rural areas were more likely to be socially and geographically isolated (Feyen, 1989), which elucidated a distrust of government, resulting in reporting crime less frequently (Weisheit & Donnermeyer, 2000). Rather, the community more likely handles crime and other deviant behaviors in rural areas internally. Due to this collective conscious, rural communities are regarded as generally more organized than urban

communities (Barnett & Mencken, 2002). However, the autonomy of rural communities is abating as the world becomes more global (Tunnell, 2006; Barclay, Scott, & Hogg, 2007; DeKeseredy & Schwartz, 2009; Ritzer, 2013, Donnermeyer & DeKeseredy, 2014). The Wal-Marting of rural America expressed by Tunnell (2006) along with additional factors such as standardization of education, have made rural culture less distinctive (Donnermeyer & DeKeseredy, 2014). Additionally, Donnermeyer and DeKeseredy (2014) contend that social organization of rural communities may not deter crime, but rather shape the type of crimes committed. One of the ways in which Donnermeyer and DeKeseredy (2014) give support to this argument is by outlining previous literature supporting “rural patriarchy” that enables domestic violence in rural communities (Websdale, 1995; DeKeseredy, Schwartz, Fagen, & Hall, 2006; Rockell, 2013). Further complicating the relationship between rural communities and crime is the fact that rural areas are not homogeneous, despite the fact popular media often provides a caricature of rural that depicts such (Donnermeyer & DeKeseredy, 2014). Nonetheless, it would be a mistake not to recognize fundamental differences in how the organization of rural areas generally differs from urban areas.

Figure 1: US Counties by Metro and Non-Metro Status



Rural Crime

Weisheit, Falcone, and Wells (2006) argue research largely ignores rural in comparison to urban crime. While there is a growing body of literature on the matter, rural crime remains relatively under-studied. Additionally, public opinion does not consider rural crime to be a major problem in comparison to urban crime (Weisheit & Donnermeyer, 2000). However, while official rural crime rates are consistently lower than urban crime rates in all index crimes (Weisheit & Donnermeyer, 2000, Wells & Weisheit, 2004), Donnermeyer (2007) found crime rates in rural communities were continuously increasing. Moreover, as of 2005, non-metro counties comprised of 17 of the top 30 counties with the highest homicide rates (Weisheit & Wells, 2005). This phenomenon may be the result of the combination of the lesser important of economic factors for the type of social organization found in rural communities and an unwillingness to involve formal social controls.

Although rural crime is a far more significant problem than is typically recognized, important distinctions exist between rural and urban crime. Weisheit and Wells (1996) argue guns, drugs, and poverty do not influence crime in rural communities to the same extent as they do in urban communities. While this may seem counterintuitive, they argue the culture and geography of rural areas deviates from urban culture despite massification, the connection of society through media, technology, national chain stores, and interstate highways that make travel more convenient. For example, less crime is associated with drug use in rural areas than urban areas (Weisheit & Wells, 1996), despite drug use among rural and urban areas being nearly identical (Weisheit et. al, 2006). Wells & Weisheit (2004) found that drugs are not as influential to street crimes in rural areas relative to urban areas. Weisheit & Wells (1996) also explain that economic prosperity in rural areas may lead to more crime, a topic that will be explored further in the upcoming paragraphs.

Disorganization of Rural Communities

Research of rural crime typically is grounded in social disorganization theory (Petee & Kowalski, 1993; Osgood & Chambers, 2000; Barnett & Mencken, 2002; Bouffard and Muftić, 2006; Kaylen & Pridemore, 2011, 2012, 2013; Wells & Weisheit, 2004, 2012). However, social disorganization exogenous variables have failed to exert the same effect in rural models as they do in urban models. Particularly, poverty and population change each have an inverse relationship with crime in rural models of social disorganization. While the causes and effects of social disorganization may be different in rural communities, patterns have appeared in the body of literature indicating social disorganization.

While racial heterogeneity is central to social disorganization, it appears less important in rural models. Research on rural social disorganization have found mixed results. For instance,

Bouffard and Muftić (2006) found no relationship between ethnic heterogeneity and violent crime. Racial composition may not be as important as rapid racial change (Bursik & Webb, 1982). Thus, the studies that have found a relationship (Petee & Kowalski, 1993; Osgood & Chambers, 2003) may have found an effect for changing racial composition rather than racial heterogeneity. Although, there may also be a curvilinear relationship between racial heterogeneity and crime, as Barnett and Mencken (2002) found the positive effect on crime rates racial heterogeneity had peaked at 30 percent nonwhite.

It is widely recognized that young males perpetrate crime disproportionately. Schulman, Steinberg, and Piquero (2013) outlined a negative relationship between age and crime is in large part due to developmental factors, after controlling for economic variables. Additionally, social disorganization factors may not affect delinquency as it does for adult criminality (Kaylen & Pridemore, 2011). In a test of social disorganization of rural youth, Kaylen and Pridemore (2011) found only one measure of social disorganization, percent of female-only households, was positively related to delinquency. The importance of normative values instilled in rural youth may be more influential than other structural factors (Regnerus, 2005). Studies controlling for percentage of younger people, generally around the ages of 18-24, have not found a significant relationship on crime (Barnett & Mencken, 2002; Bouffard & Muftić, 2006).

A common characteristic of rural communities related to crime is the prevalence of poverty. Brown and Hirschi (1995) noted the highest levels of poverty occur in rural areas. Weisheit et al. (2006) outlined how high unemployment and low wages in rural areas push out skilled and educated workers while creating a class of marginalized workers. Additionally, the domination of one industry in many rural areas, such as an oil company or prison, created wide disparities in income by denying employment to some community members (Weisheit et al., 2006). However, previous studies on social disorganization of rural and nonmetropolitan neighborhoods have produced mixed results. Unemployment generally predicted more crime (Osgood & Chambers, 2000; Bouffard & Muftić, 2006). However, poverty, low socioeconomic status, and income inequality have not produced a significant effect on crime rates in rural models (Petee & Kowalski, 1993; Osgood & Chambers, 2000; Wells & Weisheit, 2004, Wells & Weisheit, 2012), while Bouffard and Muftić (2006) even found crime generally increased with lower rates of poverty. While this relationship may be perplexing, as Weisheit and Wells (1996) alluded to, poverty may play a different role in rural communities. Community stability may interact with socioeconomic status to create social control (Barnett & Mencken, 2002). Therefore, economic prosperity may be counterproductive to the informal social control characteristic of rural communities in some cases if an industry lures in a sudden increase of new residents, interrupting the familiarity shared between existing members of the community.

The informal social control branding rural communities is reliant on population stability. The introduction of new community members into rural communities may infringe on

interpersonal relationships critical to informal social controls (Freudenberg, 1986). In other words, cohesion based on a collective conscious and shared morality (Durkheim, 1893/1964) encounters strong resistance when members of the community are not familiar with each other. This notion has produced mixed results in the literature. Measures of residential instability have been reliable predictors of crime in rural models of social disorganization (Wells & Weisheit, 2004, 2012; Bouffard & Muftić, 2006). Some findings indicated a relationship between population and crime rates in rural areas (Freudenberg & Jones, 1991; Jobes, 1999; Osgood & Chambers, 2000, Wells & Weisheit, 2004; Bouffard & Muftić, 2006). Other studies, however, did not (Wells & Weisheit, 2012). Osgood and Chambers (2000) found population did not affect violent crime among juveniles in areas that contained over 4,000 juveniles. Thus, only small counties exhibit *gemeinschaft*. Barnett & Mencken (2002), however, found the effect of population growth on crime in a community was conditional on resource disadvantage being average relative to other communities. Additionally, the researchers found population decline also has a positive effect on crime rates when a community has greater resource disadvantage. While the nature of population growth and poverty has a more convoluted relationship with crime rates in comparison with urban areas, generally population growth does appear to effect crime when certain conditions are present in rural areas.

The current study attempts to identify specific factors that contribute to the crime rate in urban and rural counties. Using secondary data collected from the United States Department of Health and Human Services on county data from 2000 – 2007, the data will be separated into rural and urban counties for comparison and to see which factors are stronger predictors across models. Information on a total of 3,141 US counties is available in the dataset. Previous research on rural crime (Deller & Deller, 2011; Weisheit & Donnermeyer, 2000, Wodahl, 2006) indicated fundamental differences in rural and urban communities. Structural disorganization in rural areas may manifest itself in different ways than urban areas, yielding different contributing factors to the crime rate. Grounded in social disorganization theory (Shaw and Mckay, 1929) the idea that social and structural conditions contribute to crime rates and Osgood and Chambers' (2006) application of the theory to rural communities, it is hypothesized that conditions that contribute to crime will differ in urban and rural areas.

Methods

Data source

Secondary data was used for the analysis of this study. The data came from County Characteristics, 2000 – 2007 by the United States Department of Health and Human Services. This dataset provides over 400 variables relating to 3,141 US counties from all 50 states for which researchers can investigate contextual influences on the county level. This dataset was obtained from the National Archive of Criminal Justice Data.

Defining rural

Data were broken down at the county level and used as the unit of analysis in this study. This is consistent with previous research that used similar methodologies (Wells & Weisheit, 2005; 2012). One of the variables in the County Characteristics dataset identifies each county as either rural or urban on a 9-point scale. The Economic Research Service (ERS) developed this scale and corresponding points on the scale are often called “Beale codes”. These “Beale codes” classify counties along a well-defined continuum that reflects the location of the county in relation to a metropolitan area and the size of the urban center in each county (Cromartie, 2007). For the purposes of this study and based on the work of Wells and Weisheit (2004), this scale was collapsed into two categories, based on the ERS’s definitions of a metro and non-metro county, to indicate rural and urban.

Dependent variable

The dependent variable measured in this study is crime rate. In the given dataset, crime rate represents the index crime rate in 2005 for crimes reported per 100,000 persons in a given county. Index crimes are official crime statistics collected by law enforcement agencies and submitted to the Federal Bureau of Investigations (FBI). The FBI publishes these figures annually in the Uniform Crime Report (UCR). The UCR is composed of two parts. Part I of the UCR consists of eight index crimes collapsed into two categories; violent and property crimes (Bohm, 2007). Violent crimes include: murder and non-negligent homicide, forcible rape, robbery, and aggravated assault. Property crimes consist of burglary, motor vehicle theft, larceny theft, and arson. Part II of the UCR includes an array of offenses, such as forgery and simple assaults. However, the data from part I is used to generate crime rates, as they are “serious crimes, they occur with regularity in all areas of the country, and they are likely to be reported by police” (offense definitions, para. 3). Crime rate will serve as an adequate dependent variable as the rate controls for population disparities among the counties.

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Independent variables

The following variables are available within the dataset and can be associated with social disorganization in a given area (Pratt and Cullen, 2005): *income, unemployment rate, median age for county population, resident population aged 14-24, sex ratio, race, population growth, housing unit growth, births, and migration*. *Income* was defined as average per capita personal income in dollars in 2005 and analyzed to determine the effect lower income has on the crime rate. *Unemployment rate* was defined as the annual average estimated unemployment rate per

county in 2005. To determine the effect of age of the county population has on the crime rate, three variables were identified. The *median age* per county was defined as the median age for the total county population in 2005, that is, the age at which 50 percent of the population was older and 50 percent was younger. To identify the percentage of the population that are adolescent to young adults and potentially more likely to commit crimes, two variables were included in the model; *resident population who are 14 to 17* and *resident population 18 to 24*. The *sex ratio*, defined as ratio of males to females in each county in 2005, was included to see if the dominant sex in the population has an effect on the crime rate. *Race* was included and separated into three variables: *percent of population white*, *percent of population black*, and *percent of population Hispanic*. Five additional variables were included to investigate the effects of recent social and structural changes in each county on the crime rate. *Population growth* was defined as the percent population growth from 2000 to 2005. *Housing unit growth* was defined as housing unit growth from 2000 to 2005. The variable *births* was defined as births per county from July 2004 to July 2005. Finally, two types of *migration* were also included: the number who immigrated into the counties from outside of the country (*net international migration*) or those who migrated to the county from elsewhere in the U.S. (*net internal migration*) between July 2004 to 2005. One limitation of this dataset was the lack of suitable variables that measure collective efficacy. In lieu of this, the remaining variables capture many of the structural components addressed in the theory (Pratt & Cullen, 2005).

Descriptive statistics were run in SPSS for both urban and rural US counties (See Table 2). The mean crime rate per 100,000 for urban counties was 3,482.62 ($SD = 1,744.19$) and 2,169.45 ($SD = 1409.47$) for rural counties. The mean *income* for urban counties ($M = 29,854.80$, $SD = 7,204.06$) was slightly higher than rural counties ($M = 25,375.54$, $SD = 5,300.09$). The mean unemployment rate per 100,000 for urban counties was 5.18 ($SD = 1.50$) and 5.60 ($SD = 2.01$) for rural counties. The average *median age* for urban counties was lower (36.5, $SD = 3.75$) than rural counties ($M = 40.05$, $SD = 4.41$). The average *number of residents age 14 - 17* for urban counties was 10,879.74 ($SD = 25,923.60$), far larger than the mean of 987.32 ($SD = 760.86$) for rural counties. Likewise, the average number of *residents age 18 - 24* for urban counties (18,752.97, $SD = 41,994.59$) was much greater than rural counties ($M = 1,625.68$, $SD = 1,417.78$). The average *sex ratio* for urban counties was 0.98 ($SD = .07$) and 1.0 ($SD = .11$) for rural counties. The average *percentage of white residents* for urban counties was less (85.41, $SD = 14.63$) than rural counties (88.33, $SD = 17.19$). The average *percentage of black* (10.56, $SD = 13.89$) and *Hispanic* ($M = 7.73$, $SD = 12.13$) residents in urban counties was slightly higher than *black* ($M = 7.70$, $SD = 14.92$) and *Hispanic* ($M = 6.56$, $SD = 12.79$) residents in rural counties. The mean *population growth* from 2000 to 2005 for urban counties was 5.52 ($SD = 7.47$) and -0.303 ($SD = 5.43$) for rural counties. The mean *housing unit growth* for urban counties was 7.73 ($SD = 6.88$), much larger than the 3.66 ($SD = 3.65$) for rural counties. The mean number of *births* from 2004 to 2005 was much greater in urban counties ($M = 2,664.86$, $SD = 6,749.76$) than rural counties ($M = 210.18$, $SD = 171.07$). In addition, the average number of *net international*

migration was much larger in urban areas ($M = 14.30$, $SD = 30.73$) than rural areas ($M = 725.28$, $SD = 3362.53$), but the mean *net internal migration* was larger in rural counties ($M = 23.94$, $SD = 250.60$) than urban ($M = -29.38$, $SD = 7437.70$)

Table 2: Descriptive Statistics for Counties

Variables	Rural Mean (SD)	Urban Mean (SD)
Crime rate per 100,000	2,169.45 (1409.47)	3,484.62 (1744.19)
Income	25,375.54 (5300.09)	29,854.80 (7204.06)
Unemployment rate	5.60 (2.01)	5.18 (1.50)
Median age	40.05 (4.41)	36.85 (3.75)
Resident population 14 – 17	987.32 (760.86)	10,879.74 (25923.60)
Resident population 18 – 24	1,625.68 (1417.78)	18,752.97 (41994.59)
Sex ratio	1.00 (.11)	0.98 (.07)
Percent white	88.33 (17.19)	85.41 (14.63)
Percent black	7.70 (14.92)	10.56 (13.89)
Percent Hispanic	6.56 (12.79)	7.73 (12.13)
Population growth	-0.313 (5.43)	5.52 (7.47)
Housing unit growth	3.66 (3.65)	7.73 (6.88)
Yearly births 2004 – 2005	210.18 (171.07)	2664.86 (6749.76)
Net international migration	14.30 (30.73)	725.28 (3362.53)
Net internal migration	23.94 (250.60)	-29.28 (7437.70)

Data analysis

Separate regression models were run for both rural and urban counties independently to identify which factors contribute the most to the crime rate. The coefficients determined from the regression model were later converted into z-scores for comparison between the two groups.

Based on a zero order correlation matrix among all relevant independent variables, there appeared to be some collinearity within a number of the independent variables (See Table 3). The variable of *resident population 14-17* was highly correlated with *population aged 18 – 24* ($r = .990$), *international migration* ($r = .915$) and *births* ($r = .993$). *Population 18 – 24* was also highly correlated with *international migration* ($r = .915$) and *births* ($r = .990$). These variables may be highly correlated as the counties that have higher *resident populations aged 14-24*, may also have more residents in general. Having more residents can lead to higher numbers of births

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Table 3: Correlation Matrix for Independent and Dependent Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Income	1													
2. Unemployment Rate	-.390*	1												
3. Median age	.080*	-.159*	1											
4. Resident population 14-17	.302*	-.034	-.158*	1										
5. Resident population 18-24	.302*	.012	-.197*	.990*	1									
6. Sex ratio	-.111*	.024	-.102*	-.066*	.064*	1								
7. Percent white	.094*	-.368*	.384*	-.125*	-.133*	.026*	1							
8. Percent black	-.130*	.314*	-.272*	.078*	.083*	-.080*	-.845*	1						
9. Percent Hispanic	-.029	.034	-.265*	.187*	.187*	.121*	.068*	-.096*	1					
10. Housing unit Growth	.206*	-.152*	-.296*	.109*	.117*	.016	.015	-.016	.042*	1				
11. Births	.293*	-.032	-.171*	.993*	.990*	-.061*	-.135*	.087*	.199*	.109*	1			
12. International Migration	.235*	-.027	-.107*	.916*	.915*	-.030	-.108*	.057*	.194*	.042	.931*	1		
13. Internal migration	-.102*	-.041*	.022	-.553*	-.550*	.029	.102*	-.077*	-.062*	.248*	-.560*	-.675*	1	
14. Population change	.139*	-.099*	-.386*	.143*	.141*	.031	.009	-.031	.082*	.804*	.136*	.064*	.236*	1
15. Crime Rate	.109*	.156*	-.361*	.226*	.249*	-.163*	-.351*	.344*	.142*	.144*	.237*	.136*	-.015	.186*

*p < .05

and immigrants when compared to smaller counties. Similarly, the high correlation of the *population aged 18 to 24* and *births* may be due to 18 to 24 being of childbearing age for young adults. Additionally, *percent white* is also highly correlated with *percent black*. ($r = -.845$).

Results

Urban model

Two multivariate OLS regression models were run to determine the contributing factors of the crime rate in both urban and rural counties. The overall urban model was significant with an R^2 value of .344, explaining 34.4% of the variance in the dependent variable. Of the fourteen independent variables, eleven were found to significantly impact the crime rate in urban counties (See Table 3): *unemployment rate*, *residents 14 to 17*, *residents 18 to 24*, *sex ratio*, *percent of population white*, *percent of population Hispanic*, *percent population change*, *percent housing growth*, *births*, *net international migration*, and *net internal migration*. Increases in six of the variables resulted in increases in the overall county crime rate. For every one-unit increase in *unemployment rate*, the crime rate increased 135.1 per 100,000 ($B = 135.10$). For every one-unit increase in the *resident population aged 18 to 24*, the crime rate slightly increased ($B = .032$). The *Hispanic population* was also positively associated with the crime rate as each increase in the percent of Hispanics in the population resulted in a crime rate increase of 26 ($B = 26.10$). Likewise, each increase in *percent housing unit growth*, *births*, and *net internal migration* resulted in an increase in crime rate of nearly 28 ($B = 27.96$), .255, and .024, respectively.

Five of the independent variables were negatively associated with the overall county crime rate. The *net international migration* of the population was negatively associated with the crime rate, for every one-unit increase in the *net international migration* the county, the crime rate slightly decreased ($B = -.196$). This was also the case for the *resident population aged 14 to 17*, ($B = -.086$), the percent of the population of the county that are *white* ($B = -31.73$), and the *percent population change* ($B = -42.16$). The *sex ratio* was also negatively associated with the crime rate. Measured by the ratio of men over women in each county, counties with higher percentage of men have lower crime rates ($B = -4444.12$). In rank order, the variables that have the greatest effect on the crime rate were *net international migration* (Beta = $-.376$), *resident population 14 to 17* (Beta = -1.26), *births* (Beta = $.971$), *resident population 18 to 24* (Beta = $.764$), *percent population white* (Beta = $-.266$), *sex ratio* (Beta = $-.191$), *percent population Hispanic* (Beta = $.188$), *percent population change* (Beta = $-.180$), *percent population change* (Beta = $-.180$), *unemployment rate* (Beta = $.116$), *percent housing growth* (Beta = $.111$), and *net internal migration* ($.098$).

Rural model

The overall rural model was significant, with an R^2 of .247, explaining 24.7% of the variance in the rural county's crime rate. Nine of the independent variables were found to significantly the crime rate in rural counties (See Table 4); *per capita personal income*, *unemployment rate*, *resident population aged 14 to 17 years*, *sex ratio*, *percent population black*, *percent population Hispanic*, *percent population change*, *births from 2004 to 2005*, and *net international migration*. Seven of the variables were positively associated with the rural crime rate. For every one-unit increase in *per capita personal income* in each county, the crime rate in rural counties slightly increases ($B = .029$). This is also the case for *unemployment rate*. For each increase in the unemployment rate, rural county's crime rate increases by 80 ($B = 80.24$). In urban counties, as the population's race becomes more heterogeneous the crime rate increases, as percentage increases in *black* ($B = 22.71$) and *Hispanic* ($B = 12.79$) result in increases in the county crime rate. *Population change* is positively associated with the crime rate, as each percentage increase in population change leads to about a 34-point increase in the crime rate ($B = 34.12$). The amount of *births* from 2004 to 2005 and *net international migration* were also positively associated with the crime rate as well, leading to increases in the crime rate of around 3 each (*Births*: $B = 2.71$, *net international migration*: $B = 3.28$).

Two variables in the rural model were negatively related to the crime rate. The *resident population aged 14 to 17* was negatively associated with the crime rate. For every increase in the population who were between 14 and 17, the crime rate in rural counties slightly decreased ($B = -.263$). Like urban counties, the *sex ratio* in urban counties were also negatively associated with the crime rate, meaning that more men in the population are associated with lower crime rates ($B = -.761.66$). In rank order, the variables that have the greatest impact on the crime rate in rural areas are *births* (Beta = .336), *percent population black* (Beta = .230), *resident population aged 14 – 17* (Beta = -.145), *population change* (Beta = .133), *percent population Hispanic* (Beta = .121), *unemployment rate* (Beta = .110), *per capita personal income* (Beta = .108), *net international migration* (Beta = .075) and *sex ratio* (Beta = -.054).

Comparing models

Because two different samples were used in the current study, it is appropriate to conduct a z-test on variables found to be statistically significant in both variables to determine if there are significant differences in the models. Brame, Paternoster, Mazerolle, and Piquero (1998, p. 258) suggest the following equation when converting b coefficients into z-scores:

$$z = \frac{(bb_11 - bb_22)}{\sqrt{SE_{b1}^2 + SE_{b2}^2}}$$

where b_1 is the unstandardized coefficient in the urban model and b_2 is the unstandardized coefficient in the rural model. For a z -test to find significance at the .05 level, a z -score of 1.96 or greater is needed. The right column in Table 3 shows significant differences in four variables: *sex ratio*, *percent Hispanic*, *births*, and *net international migration*. The amount of births ($z = -3.04$) and the *net international migration* ($z = 2.76$) had a larger effect on the crime rate in rural counties than it does in urban counties. *Sex ratio* ($z = -5.74$) and the percent of the *population Hispanic* ($z = 2.84$) has a larger effect on the crime rate in urban counties than rural counties.

Table 4: OLS Regression Results for Urban and Rural Models

Variable	Urban Model (R ² =0.344)		Rural Model (R ² =0.247)		z-score
	B (S.E.)	Beta	B (S.E.)	Beta	
Income	0.000 (0.007)	NS	0.029* (0.007)	0.108	
Unemployment rate	135.10* (31.82)	0.116	80.24* (19.57)	0.110	1.47
Median age	-35.63 (14.45)	NS	5.65 (11.81)	NS	
Population 14-17	-0.086* (0.015)	-1.26	-0.263* (0.168)	-0.145	1.04
Population 18-24	0.032* (0.008)	0.764	0.077 (0.048)	NS	
Sex ratio	-4444.12* (551.78)	-0.191	-761.66* (327.61)	-0.054	-5.74*
Percent white	-31.73* (7.53)	-0.266	-0.369 (4.19)	NS	
Percent black	7.18 (7.89)	NS	22.71* (4.23)	.230	
Percent Hispanic	26.10* (3.81)	0.188	12.79* (2.73)	0.121	2.84*
Percent population change	-42.16* (12.41)	-0.180	34.12 (9.54)	0.133	-0.31
Percent housing growth	27.96* (13.08)	0.111	-9.75 (10.62)	NS	
Births	0.255* (0.059)	0.971	2.71* (0.746)	0.336	-3.04*
Net international migration	-0.196* (0.040)	0.376	3.28* (1.26)	0.075	2.76*
Net internal migration	0.024* (0.009)	0.098	0.031 (0.159)	NS	

* significant at .05 level; NS – not significant

Discussion

The current study investigated differences in the contributing factors of crime rates in rural compared to urban counties. It was hypothesized that there would be different factors that would contribute to the crime rate in rural areas and urban areas. Grounded in social disorganization theory, a total of fourteen independent variables were selected and tested as possible contributing factors to the crime rate.

The hypothesis that somewhat different factors would contribute to the crime rate in rural and urban counties was supported by this research, making for distinctive sets of explanatory factors between the urban and rural models. Of the fourteen variables, eleven significantly contributed to the crime rate in the urban model and nine contributed to the crime rate in the rural model. Between the two models, seven variables overlapped as significant contributors: *unemployment rate*, *resident population 14-17*, *sex ratio*, *percent of population Hispanic*, *births*, *percent population change*, and *international migration*. Of those seven variables, four were significantly different from each other: *sex ratio*, *percent of population Hispanic*, *births*, and *international migration*. Both *sex ratio* and *percent of population Hispanic* were greater predictors of crime for urban counties. For rural counties *birth rates* and *international migration* were greater predictors of crime.

Sex ratio was a significantly better contributor to the crime rate in urban areas than rural areas. This measure was significant in both the rural and urban models, but in an unexpected direction. According to the results, the more males in a county indicated a decrease in crime. As men are typically associated with the commission of crime, one would expect counties with more men to be a contributing factor to the crime rate. It is possible that having more men in the county could be evidence of intact family units, and therefore less family disruption (Kaylen & Pridemore, 2011). Shaw and McKay (1942) do indicate that one sign of social disorganization could be more single-mother headed households and a breakdown of the informal social controls of the family. While this is strictly speculation it could be one reason for the findings regarding sex ratios in this data. However, this finding is also consistent with previous literature on rural crime (Kaylen & Pridemore, 2011).

Race played an interesting role in each of the models. In the urban model, the higher percentage of *white* residents in the population, the lower the crime rate in the given county. This could be evidence of racial homogeneity, which according to social disorganization theory would decrease the crime rate, or possible evidence of more critical theories such as Racial Threat (Blalock, 1967). However, this was not the case in the rural model, where *white* residents were not a significant factor. The *proportion of whites* not affecting the crime rates in any significant

means should not be surprising, as *whites* make up the majority of rural areas (Housing Assistance Council, 2012).

The percentages of *black* and *Hispanic* residents were significantly related to the crime rate within rural counties, with a higher *black* population playing a more significant role than *Hispanic*. This result could be due to the heterogeneity of the population, which would be further evidence to support social disorganization theory. It was found, however, that the percent *Hispanic* population was a stronger predictor of the crime rate in urban areas than rural counties. The simplest explanation for this would be the recent rise in the *Hispanic* population in the US. These immigrants may be settling in urban counties that have a higher crime rate due to cheap and available housing that *white* individuals are not taking advantage of. This too, would support the idea of social disorganization, and more specifically the transitional zone-- being both affordable for immigrants and crime ridden. It should also not be surprising that individuals would choose urban areas over rural due to more employment opportunities, and available transportation. However, an alternative theory is that these minorities who settle in rural areas are more likely to turn to crime because in these areas where many suffer from poverty and unemployment *blacks* and *Hispanics* are shown to suffer even more from these conditions (Turner, 2014). Moreover, this is supportive of previous literature on rural crime that discusses this issue as being more about disruption the social controls in place by long term residents, rather than heterogeneity itself (Bouffard & Muftić, 2006).

Two variables that had a larger effect on crime in rural areas compared to urban were *births* and *international migration*. For *births*, this would be interpreted as the more births in a county, the higher the crime rates. This could be evidence of families increasing their needs both economically and socially, which burdens the family when not prepared. This is also indirect evidence that as economic needs increase, crime may follow. It is also possible that the population density of youths permits less capable guardianship, similarly to how residential instability effects guardianship (Kaylen & Pridemore, 2011; Kaylen & Pridemore, 2012).

International migration, which examines those who move into counties from other countries, may be further evidence of the effect of racial heterogeneity on crime. Following the logic that individuals who move from other countries may need to find employment and transportation. This can be much more difficult in rural areas where jobs are sparse and rarely does public transportation exist (Wodahl, 2006). Therefore, economic burdens may be more worrisome for individuals from other countries and may need to turn to crime. This is also counter to previous evidence that *immigration (net international migration)* helps decrease crime in urban areas (See Sampson, 2002).

Only two factors seemed to effect rural and not urban areas. The first, as discussed above, was percentage of the population that was *black*. The second was *income*. *Income* was measured

as the average net income in the county. *Income* was positively related to the crime rate. This was an interesting finding, as one would expect income to be negatively related to the crime rate, but was similar to the findings of Bouffard and Muftić (2006), Kaylen and Pridemore (2011; 2012), and Weisheit & Wells (1996). One possible explanation for this is that people in more affluent counties may be more willing to call and report crimes. Rural areas rely on call-ins from residents due to the fewer amount of officers, and more areas to patrol with fewer residents. However, because this study used county level data, it is difficult to account for income disparities, as many urban areas have very affluent and very poor residents making up the county.

Comparisons to previous studies

Although the body of literature on rural crime is growing, it is still very small. It is imperative for researchers within this field to discuss those studies, which came before their own in order to draw more rounded and empirical conclusions. Several existing studies have previously used county level data to examine rural areas and are appropriate to discuss in the context of these findings.

The current study was similar to Wells and Weisheit's (2004) study comparing rural and urban crime at the county level. Wells and Weisheit (2004) examined many measures of social disorganization. Most of which were important for the predictability of crime and contained numerous variables that had better predictability for rural areas than urban. Although our studies utilize different measures of social disorganization, both found population change and residential mobility to be key predictors of rural violent crime. This alone adds to the empirical evidence that urban and rural criminogenic factors are different from one another.

A key difference between the two studies is Wells and Weisheit's (2004) use of indices, as opposed to raw measures utilized in the current study. There are positives and negatives to each approach, and important implications that can be drawn. The current study found that racial diversity, often suspected of being a better predictor of crime in homogenous areas (i.e. rural areas), was a better predictor of crime in urban areas, when only examining the percentage of the population, which was *Hispanic*. Wells & Weisheit (2004) looked at minorities as a whole and therefore no significant differences between rural and urban areas. While percentage *Hispanic* was not as predictable in rural areas as urban, this finding as well adds to the apparent differences between rural and urban communities and criminality.

Osgood and Chambers (2000) also examined rural violent crime. Their study utilized measures of violence crime from 1989-1993, and only examined characteristics of rural areas without comparing them to urban areas as other studies have done. Three specific variables utilized in some way in almost all ecological studies of crime were included: residential

instability, ethnic diversity, and family disruption. All three have been shown to be important to both urban and rural areas in the current study, as well as previous. However, one important variable was that of poverty. Osgood and Chambers (2000) did not find an important relationship between levels of poverty in rural areas and crime and other studies have found mixed results regarding such measures (Deller & Deller, 2011; Osgood & Chambers, 2000; Wells & Weisheit, 2004). Their results, along with the results of *income* in the current study begin to shine a light on the unique role income inequality and poverty have in rural areas. This brings to fruition what Weisheit and colleagues (1999) refer to as the Homogeneity Assumption. This assumption declares that all rural areas are essentially the same and should be treated as such. However, the results throughout the rural literature seem to disprove this assumption, which is imperative for future research on rural crime.

Another recent study with important findings to add to the empirical value of rural criminological studies is that of Deller and Deller (2011). Their study also utilized county level data to examine crime rates and structural differences between rural and urban areas. The authors chose structural measures based on important theories, often used to explain the ecological impact on crime, anomie and social disorganization. Their results did show evidence that the role of median household income has changed in determining crime levels over time, specifically for urban areas. However, measures of inequality which were insignificant to crime rates in the 1990s in rural areas were starting to shift by 2000. This seems to be reflected in the more current data of the current study, which utilizes crime rates five years more current than those of Deller and Deller (2011). Their conclusions, like those of Wells and Weisheit (2004) provide further empirical support that crime and its causes are different in rural and urban areas. Deller and Deller (2011) state they “are not ready to conclude that we need new theories of crime that are unique for rural areas, but it is clear additional work on rural crime is needed. (p.132).” This study as well as future studies should seek to add to this growing body of literature, as describe below.

The results of the current study as well as these previous studies on rural crime cannot refute the similarities between rural and urban areas and criminality. However, it seems that along with these similarities there are certainly differences as well, specifically regarding *income, poverty, unemployment* and *racial heterogeneity*. Moreover, these studies all examine crime at different points and as Deller and Deller (2011) have pointed out it does seem the role of crime in rural areas is shifting. Weisheit et al’s (1999) homogeneity assumption also should be examined further due to the lack of conclusive evidence to support all rural areas being identical in their causes of criminality. Therefore, although similar to Deller and Deller (2011), we are not prepared to say that current ecological theories of crime cannot be utilized with rural samples, we are prepared to say rural and urban areas are different and should be observed and studied as unique geographic regions.

Limitations

The current study is limited by the variables that were used. Because secondary data was used, variables were selected that seemed best related to social disorganization theory. These variables were not necessarily the best measures possible (i.e. no measure of collective efficacy), but were found to be appropriate structural variables.

The use of county level data was convenient for the coding of rural and urban counties, but not necessarily the most valid. It is possible that an area in a rural county could have characteristics that are associated with a rural area. For example, within Blair County, Pennsylvania is the city of Altoona. Blair County is considered a rural county. Altoona is a small city, but one of the larger cities in Pennsylvania. Although much of the county is extremely rural, individuals growing up in Altoona may be completely different from their rural counterparts, potentially confounding data from that county.

Implications

Despite the limitations above, the current study identifies potential differences in the factors that contribute to the crime rate in rural and urban counties. Particularly the effect of *race*, *births*, and *international migration*. However, it should be noted that there were many similarities between urban and rural areas as well.

This study could serve as a launching point for future research on rural crime. Not all crime is the same, and the environment may play a role what causes crime. Different locations produce different opportunities, and a “one size fits all” model for crime may not be compatible in the realm of rural crime. Future studies should also delve into the relationship between familial variables in rural areas and crime. Based on the exploratory findings of this research future researchers should focus on family size, single parent households, and informal controls which may directly affect the need to turn to criminal vices to provide.

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