

Police Coercion in Socially Disorganized Neighborhoods: A Use-of-Force Study

by

Jerry T. Atkins

A thesis submitted to the faculty of Radford University in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Criminal Justice

Thesis Advisor: Dr. Isaac Van Patten

December 2013

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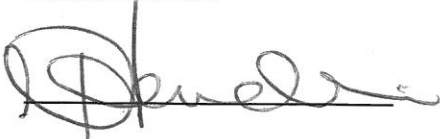


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ABSTRACT

Scholars have been interested in the culture of the police for decades. In particular, researchers have paid close attention to police coercion and use of force. More recent research has begun to explore the idea that neighborhood context impacts the decision to use force during a police-citizen encounter. The present study examines how neighborhood characteristics influence the likelihood of force being used during an encounter. The theoretical model of this study suggests that force is more likely to be used in socially disorganized neighborhoods, which is likely due to the “code of the street” operating in such neighborhoods (Anderson, 1997). The data used in the current analysis was provided by the Roanoke Police Department, which is located in southwestern Virginia. A series of OLS regression analyses allowed the researcher to identify three neighborhood-level variables that significantly predict self-reported police use of force incidents (black percent, family poverty rate, and public disorder rate); thereby, partially supporting the idea that force is more likely to be used in socially disorganized neighborhoods. A geographically weighted regression (GWR) allowed the researcher to further analyze the data and to identify which locations each variable was a significant predictor for police use of force. The results of the GWR dismantle the idea that the police are more likely to use force in socially disorganized neighborhoods, as the OLS regressions initially illustrated, due to the fact that the strength of each variable varies from one location to another (i.e., non-stationarity). Policy implications, limitations, and directions for future research are also discussed.

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Chapter I: Introduction

The police perform several tasks throughout their daily routines namely the tasks of crime fighting and peacekeeping (Bittner, 1990). The police are often called upon to perform order maintenance tasks such as assisting individuals in need of medical care or attention, traffic control and enforcement, and responding to nuisance calls (Bittner, 1990; Reiss, 1971). However, the capacity for the police to use force against citizens is what defines the role of police (Bittner, 1990). Society has essentially abolished the use of violent means towards other individuals through legislation, because of society's interest in utilizing peaceful means to resolve conflicts. Yet, modern societies have authorized the police to use force whenever necessary due to "... the belief that he who risks life and limb ought not to be unduly restricted" (Bittner, 1990, p. 189). Therefore, police are expected to respond to a large variety of situations due to the virtual monopoly they possess. That is, "the role of the police is to address all sorts of human problems when and insofar as their solutions do or may possibly require the use of force at the point of their occurrence" (Bittner, 1990, p. 128). Thus, unlike any other profession, the government has afforded the police the unique ability to use force in situations in which the police deem necessary; thereby acting as society's lone representative of coercion.

Over the past five decades, the behavior of police has been a focal point in the research of criminologists. Contemporary scholars have begun to examine police use of force and the topic of police use of force has become more commonplace in recent literature (Holmes, 2000; Jacobs & O'Brien, 1998; Kane 2002; Klinger, 1997; Parker et al., 2005; Smith & Holmes, 2003; Sun, Payne, and Wu, 2008; Terrill, 2003; Terrill &

Mastrofski, 2002; Terrill & Reisig, 2003). According to Eith & Durose (2011), approximately 776,000 U.S. citizens, ages 16 or older, were threatened with or exposed to use of force by police officers at least one time during the 2008 calendar year (p. 11). More importantly, Eith & Durose (2011) found that almost three fourths (74.3%) of those individuals felt the use of force was excessive (p. 12). Thus, the subject matter of police use of force has deservedly drawn a tremendous amount of attention from scholars.

The purpose of this study is to analyze the geographical pattern of police use of force, specifically to see if socially disorganized neighborhoods have higher levels of use of force. This study seeks to examine the following research question: What impact or influence do disadvantaged neighborhoods have on the likelihood of force being utilized? Chapter 2 of this study will provide the reader with a review of literature examining police use of force, which will illustrate how scholars have empirically studied use of force and support the direction of the current study. Chapter 3 will provide the reader with the theoretical basis of this study in relation to police use of force (i.e., social disorganization theory). Also, it will consist of a discussion regarding police use of force in socially disorganized neighborhoods. Thereafter, Chapter 4 will describe the data utilized in this study and the methodology employed. In Chapter 5 the results of this study will be presented. Lastly, in Chapter 6, limitations of this study, policy implications, and directions for future research will be explored.

Chapter 2: Review of the Literature

Defining Use of Force

Throughout the literature, scholars have operationalized police use of force in several different ways. Therefore, there does not seem to be a consensus on exactly what type(s) of force should be included in an analysis of the topic. For example, Jacobs & O'Brien (1998) only inspected deadly force when studying police use of force (Jacobs and O'Brien, 1998). Jacobs & O'Brien examined the number of police homicides or killings per 100,000 in their analysis of 170 U.S. cities. Their reasoning for only using deadly force within the analysis was due to the fact that reports of homicides tend to be accurate and "homicides are difficult to conceal" (1998: p. 846). In addition, Holmes (2000) and Smith & Holmes (2003) examined criminal civil rights complaints to assess the amount of force used within municipal police departments serving populations greater than 150,000.

Kane (2002) considered police officers that were "terminated" or "dismissed" due to "misconduct," in New York City from 1975-1996, as his representation of police use of force (p. 875). An officer had engaged in misconduct if one "used his/her employment status to engage in job-specific malpractice," such as violence (excessive force; p. 874). However, Kane did not specifically separate or measure job-related violence (excessive force). Instead, he included all violent acts an officer had committed (general and job-related) while employed by the New York City Police Department. Additionally, Parker et al. (2005) relied on official reports of nonlethal force, in which an officer had to file a use of force report, for their outcome measure.

The aforementioned research has relied heavily upon official reports of police use of force, mainly that of physical and lethal force. By doing such, researchers have neglected the idea of “verbal force,” due to the fact that “verbal force” is often excluded from official police reports (Terrill, 2003; Terrill & Mastrofski, 2002, Terrill & Reisig, 2003). However, more expansive and complex definitions have arisen in the research of other academicians. Terrill (2003), Terrill & Mastrofski (2002) and Terrill & Reisig (2003) argue for a more comprehensive, and almost all encompassing, definition of police use of force. They define force as any “acts that threaten or inflict physical harm on suspects” (Terrill, 2003, p. 56; Terrill & Reisig, 2003, p. 299) or “citizens” (Terrill & Mastrofski, 2002, p. 228). Unlike previous inquiries, Terrill and his colleagues include both *verbal and physical* force in their definition. They argue that research that fails to acknowledge verbal commands or threats as a form of force are significantly limited because such acts are coercive in nature. It should be noted that a simple greeting between an officer and suspect/citizen was not included as a form of force.

In addition to their definition of force, Terrill and his colleagues suggested that force can be ordered along the following continuum: no force applied, verbal, physical restraint, and impact methods. Also, they examined only the most forceful/harmful acts during a police-citizen encounter. Although an officer may engage in several acts of force during a police-citizen encounter, Terrill and his colleagues were only interested in the most severe form of force. That is, the form of force which imposed the greatest degree of harm on the suspect/citizen.

As this section has illustrated, scholars have been reluctant to utilize a single definition when examining police use of force. After comparing the multitude of

conceptualizations presented by scholars, it appears that more recent literature is striving to reduce the ambiguity of use of force definitions between different scholars, with Terrill and his colleagues leading the way in increasing the efficiency and accuracy of use of force studies. Due to the fact that scholars have not consistently defined police use of force, use of force for this study will consist of strictly of incidents that involved physical force. The data used in this analysis does not allow the researcher to measure any other “level” of force (e.g., verbal force).

Chapter 3: Social Disorganization Theory

A highly neglected area in the study of police use of force is one that examines the ecological or structural factors within a community and how such factors may impact the likelihood that force will be utilized in a police-citizen encounter (Klinger, 1997). Recently, however, academicians have begun to examine how the context of a neighborhood can impact the likelihood that force will be utilized against citizens. In particular, scholars have utilized social disorganization theory in attempting to explain the occurrence of police use of force (Kane, 2002; Klinger, 1997; Parker, et al., 2005; Smith, 1986; Terrill & Mastrofski, 2002; Terrill & Reisig, 2003; Sun, Payne, & Wu, 2008). However, before embarking on an examination of the relationship between police use of force and social disorganization theory, it would be beneficial to explain the historical development of social disorganization theory.

Social disorganization theory was established to explain higher rates of crime in urban locations. The theory is predicated on the idea that criminal behavior can be explained by examining the characteristics of a city, community, or neighborhood (Cullen and Agnew, 2006; Lanier and Henry, 2010). The theory is rooted in Robert Parks' and Ernest Burgess' analysis on the development of the city. Parks believed that cities grow through processes similar to that of plants and animals. In particular, he suggested that cities evolve through the processes of invasion, domination, and accommodation and these processes help to generate competing moral values (Lanier and Henry, 2010, p. 227). Following Parks' assessment of city growth, Ernest Burgess developed the Concentric Zone Theory in which he further explained the advancement of cities. Burgess suggested "urban areas grow through a process of continual expansion

from their inner core toward outer areas” (Cullen and Agnew, 2006, p. 87). Furthermore, Burgess demonstrated that urban cities can be broken down into five distinct “zones.” Zone I, the center city, was characterized by a multitude of business buildings and industrial factories. Zone II was labeled the zone in transition because it was the “melting pot” of ethnic groups, which resided in this area due to its proximity to employment opportunities in factories and low-cost dwellings. Zone III, the zone of workingman’s homes, was occupied by 2nd and 3rd generation immigrants who had successfully adapted to city life and were able to migrate away from the zone in transition. Zone IV was categorized as the residential zone due to the fact that it encompassed middle-class family homes and more expensive apartments. The commuter zone, Zone V, was occupied by upper-class families, and it was the most sought-after zone within which to reside (Bernard, Snipes, and Gerould, 2010; Cullen and Agnew, 2006; Lanier and Henry, 2010).

The most influential piece of research, which examined the relationship between the characteristics of a city and crime rates, was authored by Clifford Shaw and Henry McKay. Shaw and McKay (1942) utilized Burgess’ Concentric Zone Theory to investigate rates of delinquency in the city of Chicago. They hypothesized that rates of delinquency would be highest in the inner-city (Zones I and II), because of the elevated levels of social disorganization, and gradually decrease in areas further away from it (Zones III, IV, and V) (Cullen and Agnew, 2006, p. 87; Lanier and Henry, 2010; p. 229). By utilizing 56,000 official court records of juvenile delinquents from 1900 through 1933, Shaw and McKay mapped where delinquents resided within each zone (Lanier and Henry, 2010, p. 230). In addition, they obtained tract-level census data to examine the characteristics of each zone (Bernard, Snipes, and Gerould, 2010, p. 136). Also, they

developed rate maps, which illustrated the “rate of male delinquency for each zone” (Cullen and Agnew, 2006, p. 87; Lanier and Henry, 2010, p. 230).

Shaw and McKay’s (1942) hypothesis was supported by finding that Zone II encompassed the highest rates of delinquents and the rates declined as one moved further away from the inner-city (Zone III-V) (Cullen and Agnew, 2006, p. 87; Lanier and Henry, 2010, p. 230). This finding was consistent over a forty year time span regardless of which ethnic group(s) inhabited the area (Cullen and Agnew, 2006, p. 87; Lanier and Henry, 2010, p. 230). Because Zone II was characterized by high rates of poverty, ethnic heterogeneity, family disruption, and residential instability (i.e., a socially disorganized area), it provided youths with an environment conducive to crime. As Shaw and McKay suggested, socially disorganized areas are conducive to crime because they result in the weakening of the social control mechanisms within a community which allow youths the freedom to engage in a wide variety of behaviors, some of which may be criminal. More importantly, weakened social control mechanisms allow for the production of differential value systems and subsequent delinquent behavior (Cullen and Agnew, 2006, p. 87; Lanier and Henry, 2010, p. 230; Shaw and McKay, 1942, p. 105).

The next scholar to examine socially disorganized communities was Wilson (1987). Wilson suggested the out-migration of middle-class black families and the deindustrialization of the American economy interacted to produce elevated rates of disadvantage in inner-cities. The out-migration of middle-class black families resulted in the loss of a “buffer” for inner-cities; thereby concentrating the most disadvantaged individuals in the inner-city. Also, the economic transition from a goods-producing to a service-producing market and the migration of businesses to suburban areas resulted in

high rates of male joblessness. Wilson suggested that the elevated rate of unemployed males explained the high rate of family disruption within inner-cities. That is, female are unwilling to engage in marriage with an unemployed male because of his inability to support a family.

Sampson, Raudenbush, and Earls (1997) further advanced the social disorganization framework with the introduction of the idea of “collective efficacy”. Sampson et al. suggested that a socially disorganized community has high crime rates because its members, as a whole, lack the ability to exert informal social control over residents (i.e., collective efficacy). More importantly, they argued that community members are unable to “intervene for the common good” because the “conditions of mutual trust and solidarity among neighbors” are nonexistent (Cullen and Agnew, 2006, p. 111). Sampson et al.’s idea of collective efficacy differs from previous research on social disorganization because they account for more than the structural conditions that impact crime rates by acknowledging that community members actively participate in contesting unacceptable behavior (Sampson et al., 1997; Cullen and Agnew, 2006) It should be noted, however, that simply residing within a socially disorganized neighborhood does not guarantee that the neighborhood will lack collective efficacy. It is quite possible that a socially disorganized neighborhood can have high collective efficacy and low crime rates, on one hand, and for an organized neighborhood to display low levels of collective efficacy and high crime rates, on the other. Put simply, social disorganization is a necessary condition for a neighborhood to lack collective efficacy, but it is not sufficient (Kурbin & Weitzer, 2003).

Nevertheless, it appears that socially disorganized areas suffer from high rates of male joblessness, poverty, family disruption, residential instability, and lack of collective efficacy. In addition, recent research has suggested that minorities, particularly African Americans, are most likely to endure disadvantage and reside in socially disorganized communities, which are characterized by high crime rates (Hannon, 2002; Krivo and Peterson 1996:2004; Sampson, 1985:1987; Shihadeh and Steffensmeier, 1994; Wilson, 1987). The fact that minorities are more likely to reside in socially disorganized communities may explain the previous race effects found in prior research by Lersch & Mieczkowski (2005), Terrill & Mastrofski (2002), and Hickman, Piquero, & Garner (2008).

In terms of family disruption, Shihadeh and Steffensmeier (1994) found the average percent of African American female-headed households to be almost three times greater than other races (26.7% > 9.3%; p. 737). Sampson (1987) found the percentage of African Americans families headed by females to be extremely elevated when compared to Caucasians (44% > 18%; p. 361). Furthermore, “in black communities, nearly one-half of households with children are headed by females (43.9%) compared to just over one-sixth (17.7%) among nonblacks” (Shihadeh and Steffensmeier, 1994, p. 737). The high levels of family disruption experienced by African Americans may be due to the low number of prospective marriage partners (Wilson, 1987). Research has indicated that African American females have ten-to-sixteen fewer employed male counterparts than Caucasian females (Sampson, 1987; Shihadeh and Steffensmeier, 1994). Also, Wilson (1987) found minority males to have significantly less workforce participation than Caucasians, irrespective of age.

Social Disorganization and Police Use of Force

Socially disorganized locations may increase the likelihood of force being used in police-citizen encounters due to the fact that officers link the social and economic status of a neighborhood with the individuals encountered within the location (Terrill & Reisig, 2003, p. 295). Officers may come to define socially disorganized areas as “bad” locations and the individuals encountered within these locations as “bad” people because these locations exhibit considerably higher rates of crime. (Smith, 1986; Terrill & Reisig, 2003). Therefore, the likelihood of police use of force may be higher in socially disorganized locations because officers assume the individuals encountered within these locations are the “kinds of people” representative of the disorganized location (Smith, 1986, p. 338). The police may “... come to readily compartmentalize various geographic areas, within which the potential exists to behave in accordance to the environment as opposed...” to an individual’s behavior or characteristics (Terrill & Reisig, 2003, pp. 296).

In order to ascertain how socially disorganized cities, communities, or neighborhoods influence the likelihood that force will be employed, many scholars have utilized a combination of variables. The most consistent variables used in these analyses include the percentages of: female-headed households, unemployed adults and males, individuals living within the same residence for less than five years, and impoverished families within a city (Bayley & Mendelsohn, 1969; Jacobs & O’Brien, 1998; Kane, 2002; Parker et al., 2005; Smith, 1986; Terrill & Mastrofski, 2002; Terrill & Reisig, 2003; Sun, Payne, & Wu, 2008). Overall, scholars have consistently found higher

incidences of police use of force in socially disorganized communities (Sun, Payne, & Wu, 2008).

Smith (1986), for example, found that police were more likely to use or threaten to use force “toward suspects encountered in nonwhite and racially mixed neighborhoods” (p. 331). Also, citizens encountered in lower-class neighborhoods were three times more likely to be arrested than citizens found in more advantaged neighborhoods (Smith, 1986). In addition, use of nonlethal force is elevated in poor neighborhoods and cities with high levels of residential instability (Parker et al., 2005). Terrill & Reisig (2003) stated “that officers are significantly more likely to use higher levels of force when encountering criminal suspects in high-crime areas and neighborhoods with high levels of concentrated disadvantage” regardless of a suspect’s behavior (p. 307).

Possible Explanations

As previously noted, police are more likely to use force in socially disorganized areas. Nevertheless, there are several possible explanations for such findings. Propositions put forth by Anderson (1997) may be of some relevance here. Anderson postulated that inner-city, disadvantaged neighborhoods are crime ridden because residents from such areas have developed a “street code.” Simply put, the code governs the proper way(s) to respond in challenging situations, which includes the use of aggression or violence. More important to individuals who adhere to the code, however, is respect. Being highly respected or “granted the deference one deserves” is essential to the code and when one feels disrespected, violence or aggression will likely ensue (Anderson, 1997, p. 2).

Anderson (1997) speculates that the code was formed due to a deep lack of trust and faith in police and the criminal justice system. Due to this lack of trust and faith, inner-city residents are more likely to resort to aggressive and violent behavior as a protective mechanism and not to appear “weak” in front of peers. Therefore, it would not be unreasonable to suggest that residents of disadvantaged communities will be more likely to act aggressively, disrespectfully, or antagonistically during a police-citizen encounter, which previous research has found to be predictors for use of force (Bayley & Mendelsohn, 1969; Sherman, 1980; Smith, 1986; Sun, Payne, & Wu, 2008).

Research executed by Bayley & Mendelsohn (1969) further supports the notion that members of underprivileged communities may act aggressively toward police officers. Bayley & Mendelsohn surveyed police officers of Denver, Colorado. When officers were asked to designate which areas they were most likely to face antagonistic or hostile subjects, the overwhelming majority of officers sited minority locations. The authors suggested “... police officers are wary of minority group persons, who are also commonly disadvantaged economically, and of the areas of the city these person inhabit” due to the fact that officers “associate minority status with a high incidence of crime, especially crimes against the person, with bodily harm to police officers, and with a general lack of support for the police” (pp. 106-107). In addition, Smith (1986) concluded that police act more coercively in lower-class, minority, or racially mixed neighborhoods, regardless of the individual’s sex, race, or demeanor (p. 338). Smith suggested this was the result of officers interpreting the individuals encountered in these areas to be indicative of the “kinds of people” who reside in such locations (1986, p. 338). Officers infer all individuals that reside in disadvantaged neighborhoods to respond aggressively

toward the police. Thus, it appears that officers are more inclined to use force in disadvantaged neighborhoods because they perceive such areas as threatening to their safety.

Chapter 4: Data & Methods

The research question to be examined in this study is what impact disadvantaged neighborhoods have on the likelihood of force being utilized. In particular, do the characteristics of a location influence the likelihood that force will occur during an encounter with the police? The hypotheses of this study can be seen below (see Figure 1, below, for the full theoretical model).

Hypothesis I: Neighborhoods with high levels of social disorganization will have higher levels of police use of force.

Hypothesis II: Neighborhoods with high levels of public disorder and drug calls for service will have higher levels of use of force.

The unit of analysis for this study is the neighborhood (i.e., census block) of which there are a total of 82. The data used in this analysis was provided by the Roanoke City Police Department of Roanoke, Virginia, which is located in the southwestern region of the state. The population of Roanoke is 97,468 (United States Bureau of the Census, 2013). The majority of the City's residents are white (66.1%), followed by black or African American (28.9%) and Hispanic or Latino (5.7%) (United States Bureau of the Census, 2013). In addition, the city itself is commonly thought to be divided into four distinct regions: northwest, northeast, southwest, and southeast.

The Roanoke Police Department requires its sworn officers to self-report any encounter in which force is used. Each report that is completed includes information regarding the officer(s) involved, suspect, and whether the incident resulted in the suspect or officer(s) being injured. Officers are required to report the level of force used during

an encounter, which includes hands and feet, use of a baton, aerosol restraint spray, other chemical agent, K9, stun gun pointed, stun gun fired, handgun pointed, and handgun fired. Each report is reviewed by department personnel to determine if the officer(s) involved in the incident acted appropriately. The dependent variable (use of force) used in the study will include each of the nine levels of force that officers are required to report when completing a use of force report. Although Terrill and his colleagues persuasively argue that verbal force should be incorporated into use of force studies, verbal force is not included in this analysis because it is beyond the scope of this study. The data provided by the Roanoke Police Department only allow the researcher to analyze incidents in which the police utilized physical force.

The Roanoke Police Department provided a total of 1,184 self-reported use of force reports from January 1, 2005 through December 31, 2007 and each use of force incident was geocoded. Calls for service data on public disorder incidents and drug incidents, which were provided by the department, were also geocoded. In addition to the data provided by the Roanoke Police Department, data from the 2007 update of the 2000 U.S. Census, which was collected by the United States Bureau of the Census, was utilized to measure the social disorganization variables. Although the two datasets in this analysis are from differing time periods, thereby raising a potential temporal ordering issue, it should not be problematic in this study due to the fact that neighborhood demographics do not significantly change over a short period of time and remain relatively stable (Gale & Longley, 2013; Longley et al., 2011).

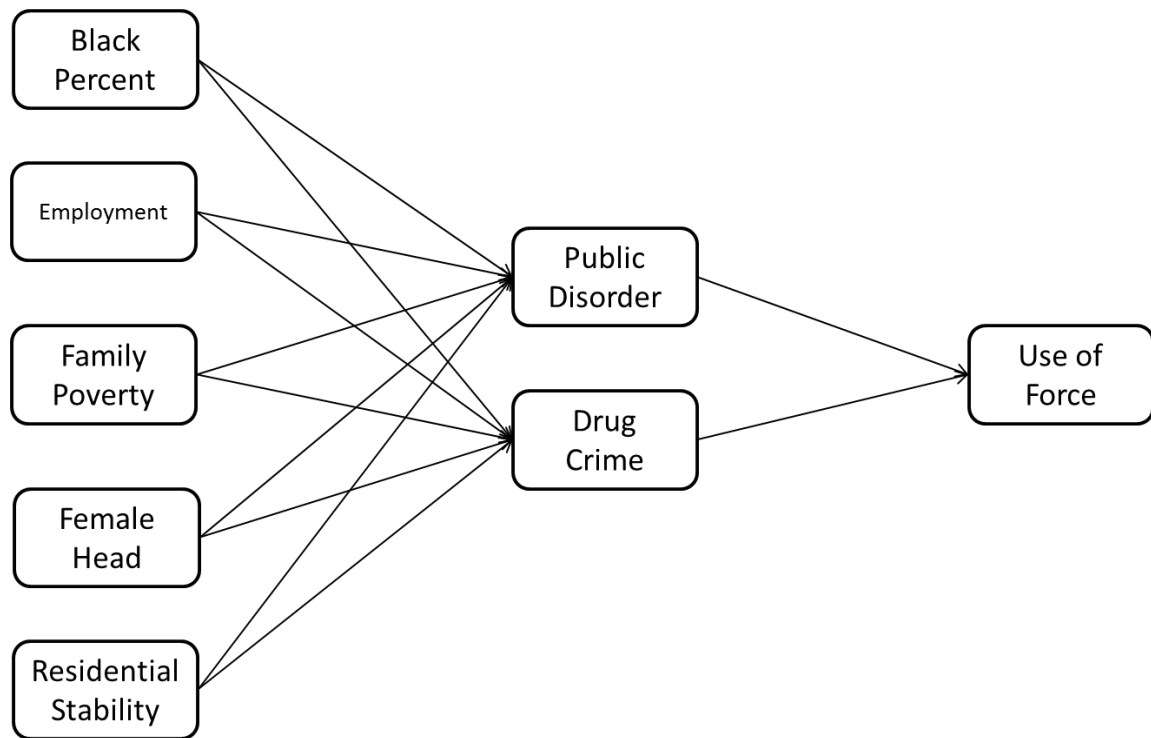


Figure 1: Full Theoretical Model

As the theory suggests, and empirical research has supported, socially disorganized neighborhoods have higher rates of female headed households, residential instability, unemployment, poverty, and typically lack collective efficacy. Minorities are more likely to inhabit such areas and socially disorganized neighborhoods tend to endure high rates of criminal activity. Thus, female headed households, residential instability, unemployment, and poverty will serve as the primary measures of social disorganization theory for this study (Bayley & Mendelsohn, 1969; Jacobs & O'brien, 1998; Kane, 2002; Parker et al., 2005; Smith, 1986; Terrill & Mastrofski, 2002; Terrill & Reisig, 2003; Sun, Payne, & Wu, 2008). Female headed household rate will be defined as the number of female headed households with children under the age of eighteen living within a census block. (Mosher, 2001; Parker et al., 2005; Sun, Payne, & Wu, 2008; Terrill & Reisig, 2003). The residential stability rate will measure the number of households which have

lived in the same house for 5 years within a census block (Parker et al., 2005; Smith, 1986). The employment rate will be measured using the number of individuals employed within a census block (Mosher, 2001; Parker et al., 2005; Sun, Payne, & Wu, 2008; Terrill & Reisig, 2003). The family poverty rate will be defined as the number of families living below the poverty line within a census block (Mosher, 2001; Parker et al., 2005; Terrill & Reisig, 2003). In addition, because recent research has suggested minorities are disproportionately subjected to use of force (Hickman, Piquero, & Garner, 2008; Smith, 1986; Terrill & Mastrofski, 2002), a measure of minority presence will be included. The variable black percent will measure the percentage of the population that is black within a census block (Parker et al., 2005; Smith, 1986).

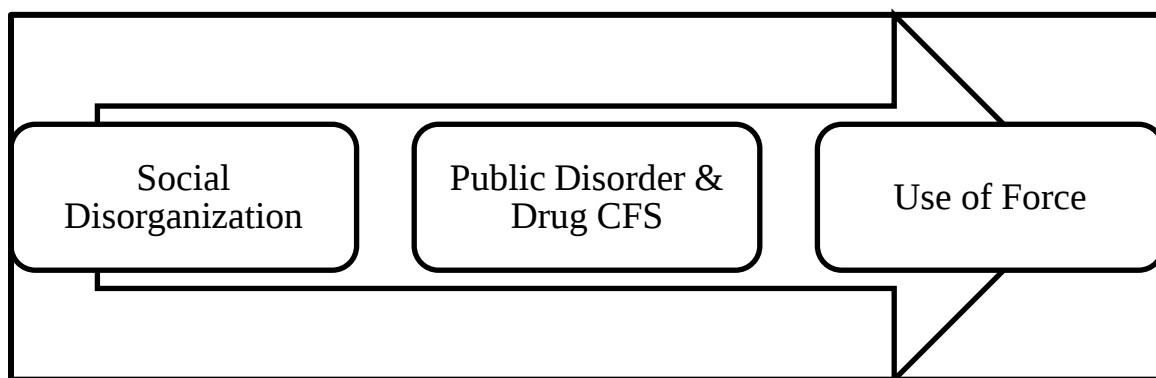


Figure 2: Simplified Theoretical Model

Public disorder and drug offenses are included to represent the debilitating effects of residing in a socially disorganized community (Figure 2). Markowitz et al. (2001) state that disorder is indicative of socially disorganized neighborhoods. More specifically, variables commonly utilized to measure social disorganization theory (see above) increase disorder within disorganized neighborhoods (pp. 311 & 312). Furthermore,

Skogan (1990) indicate that visual and physical signs of social disorder “... provide readily observable evidence of the extent of local decline” or social disorganization of a neighborhood (p.212). In addition, Martinez Jr., Rosenfeld, & Mares (2008) suggest “... traditional, dimensions of social disorganization predict drug activity” and the authors reported significantly higher rates of drug activity in socially disorganized neighborhoods. Therefore, it is necessary to include measures of public disorder and drug offenses because there is likely to be a high police presence in socially disorganized neighborhoods (Mosher, 2001), which are often plagued by public disorder and drug offenses (Markowitz et al., 2001; Martinez Jr., Rosenfeld, & Mares, 2008; Skogan, 1986).

The public disorder variable includes calls for service to the Roanoke Police Department for drunken persons, public disorder, and disorderly persons, which occurred within a census block (Markowitz, 2001; Ross & Jang, 2000; Skogan, 1986). Also, the variable, drug crime, measures the number of drug calls for service to the Roanoke Police Department within a census block (Mosher, 2001). The use of force, public disorder, and drug rates utilized in this study were standardized to a rate per 1,000 residents. Each of the variables was standardized to a rate in order to control for the number of calls for service for each census block. This was done because some census blocks may have a higher number of calls for service than other census blocks, which would increase the likelihood of a self-report use of force incident occurring because there is an elevated possibility for a police-citizen encounter to take place.

To calculate a rate for use of force, public disorder, and drug crime, all calls for service and self-reported use of force incidents that occurred from 2005-2007 were

geocoded to the census block level. To obtain the drug crime rate for a neighborhood, the total number of drug calls for service for a neighborhood was divided by the total number of calls for service for the neighborhood and multiplied by 1,000 (drug calls for service/total calls for service*1,000). The same process was utilized to obtain the public disorder rate (public disorder calls for service/total calls for service*1,000). Lastly, to obtain the use of force rate, all self-reported use of force incidents that occurred within a neighborhood were divided by the total number of calls for service and then multiplied by 1,000 (self-reported use of force incidents/total calls for service*1,000).

An ordinary least squares (OLS) regression analysis was used to estimate the effects of the social disorganization variables on the public disorder and drugs rates and the use of force rate. An OLS allows researcher(s) to identify which independent variables (i.e., social disorganization variables) are significantly related to a dependent variable (use of force). Although an OLS regression can shed light on the relationships between variables, it is a global regression method. In particular, OLS regressions assume that residuals are independent and identically distributed across the study area. Therefore, OLS regressions model relationships for the study area as a whole and do not allow for relationships to vary across the study area (i.e., stationarity). Unlike OLS regressions, geographically weighted regressions (GWRs) allow researchers to violate the assumptions of OLS regressions and to account for spatial non-stationarity or the fact that relationships between variables may vary from location to location (Mennis, 2006, p. 1). Therefore, a GWR was used to determine which variables and locations are most likely to result in use of force.

Chapter 5: Results

The theoretical model of this study will allow the researcher to examine whether social disorganization will predict police use of force within a neighborhood. That is, the likelihood that use of force will occur is influenced by environmental factors, such as those existing in socially disorganized neighborhoods. As the level of disorganization in a neighborhood increases, it is likely to be associated with an increase in self-reported police use of force incidents. An OLS regression was used to fit the data. Therefore, black percent, family poverty rate, female headed household rate, residential stability rate, employment rate, drug crime rate, and public disorder rate will be analyzed to determine which variables are significantly related to self-reported police use of force incidents. A GWR was also employed to further illustrate which variable(s) and location(s) significantly predict police use of force within a neighborhood.

Variable	Mean	Range
Use of Force Rate	4.28	17.61
Black Percent	27.01	99.51
Employment Rate	48.55	61.71
Family Poverty Rate	254.57	365.91
Female Headed Households Rate	44.91	192.66
Residential Stability Rate	500.26	598.96
Public Disorder Rate	125.16	186.47
Drug Crime Rate	19.53	75.21

Table 1: Descriptive Statistics Table

Descriptive Statistics

Table 1 displays the descriptive statistics for the variables utilized in this study. The average use of force rate per neighborhood is 4 ($M=4.28$). The distribution of this variable is positively skewed, as shown below in Figure 3, which indicates that a small number of census blocks are subjected to a greater number of self-reported police use of force incidents when compared to the bulk of the City's census blocks, which experience relatively few police use of force incidents (Range = 17.16).

On average, the percentage of blacks living within a census block is 27 ($M=27.01$). This variable is positively skewed (see Figure 4 below), which indicates that some neighborhoods within the city of Roanoke contain a relatively large or extremely small proportion of blacks (Range = 99.51). Roughly half of employment-eligible individuals residing within a census blocks are employed ($M=48.55$). The employment rate is slightly negatively skewed, as shown below in Figure 5, due to the fact that a small number of census blocks have an extremely low number of employment-eligible residents employed (Range = 61.71).

The average number of families living below the poverty rate per neighborhood is 255 ($M=254.57$). As displayed below in Figure 6, this variables possesses a negative skew, which indicates that the majority of families living within a census block are not living below the poverty line, although a small number of families are (Range = 365.91). The mean number of the female headed households within a census block is 45 ($M=44.91$). The distribution of this variable displays a positive skew, as evidenced in Figure 7 (below). This suggests the majority of neighborhoods within the city contain

relatively low levels of female headed households with a small portion of neighborhoods having a high number of households headed by single females (Range = 192.66).

The residential stability variable appears to be normally distributed, as Figure 8 illustrates, which indicates that this variable will allow the researcher to make more accurate predictions. The average number of families living in the same household for the previous five years per census block is 500 ($M=500.26$). Each neighborhood within the city displays an average public disorder rate of 125 disorderly incidents per 1,000 residents ($M=125.16$). In addition, the distribution of public disorder appears to be normally distributed (see Figure 9 below). The mean drug crime rate of each census block is 20 drug incidents per 1,000 residents ($M=19.53$). This variable displays a positively skewed distribution, as depicted in Figure 10 (below). The positive skew may be due to the fact that a small number of neighborhoods have relatively high rates of drug crime while the vast majority of neighborhoods contain low levels of drug crime (Range = 75.21).

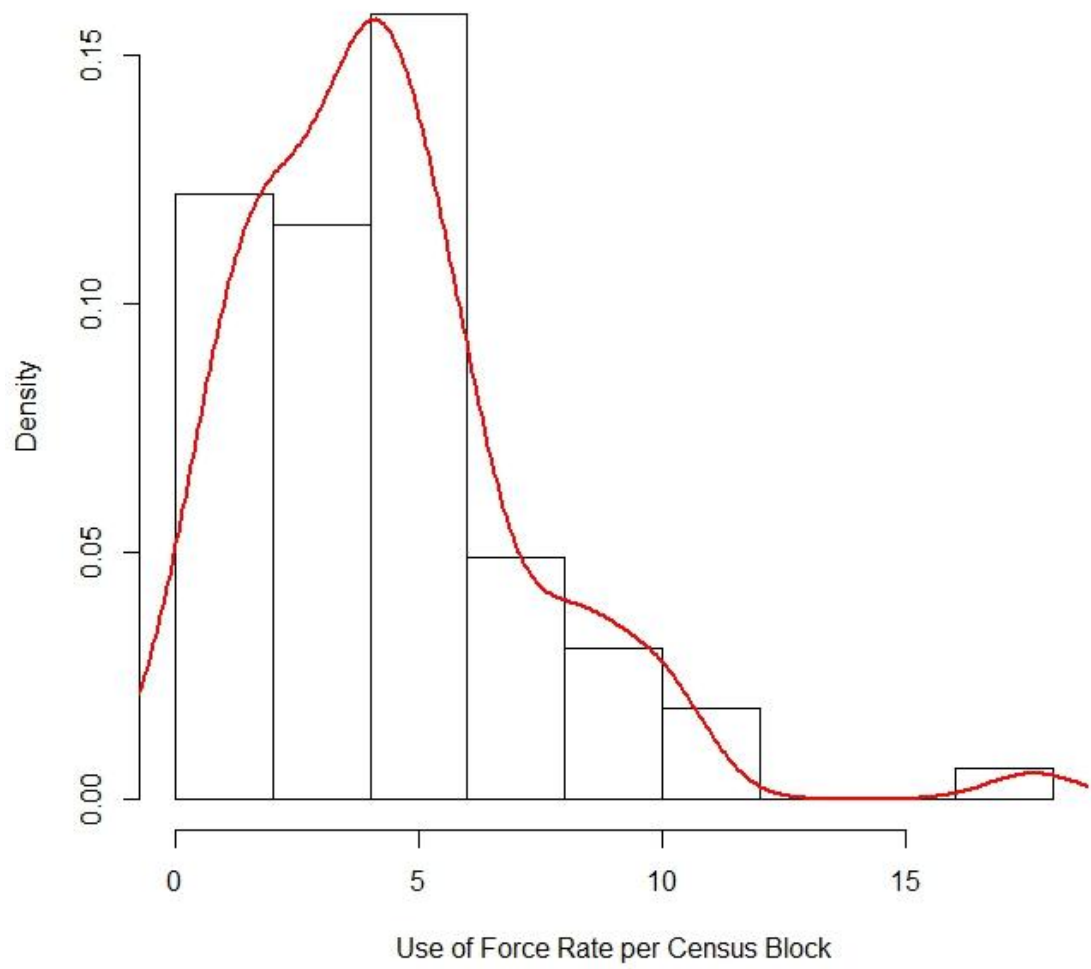


Figure 3: Use of Force Histogram

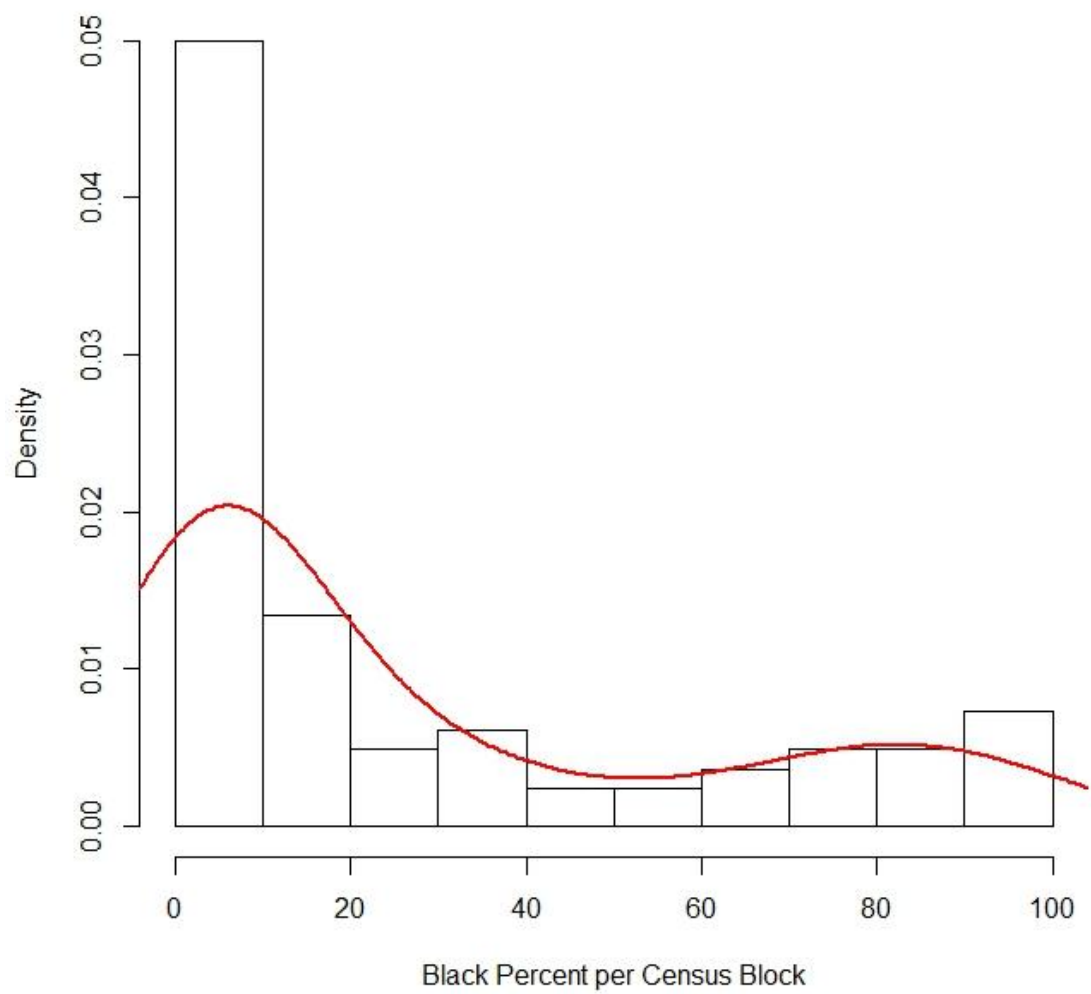


Figure 4: Black Percent Histogram

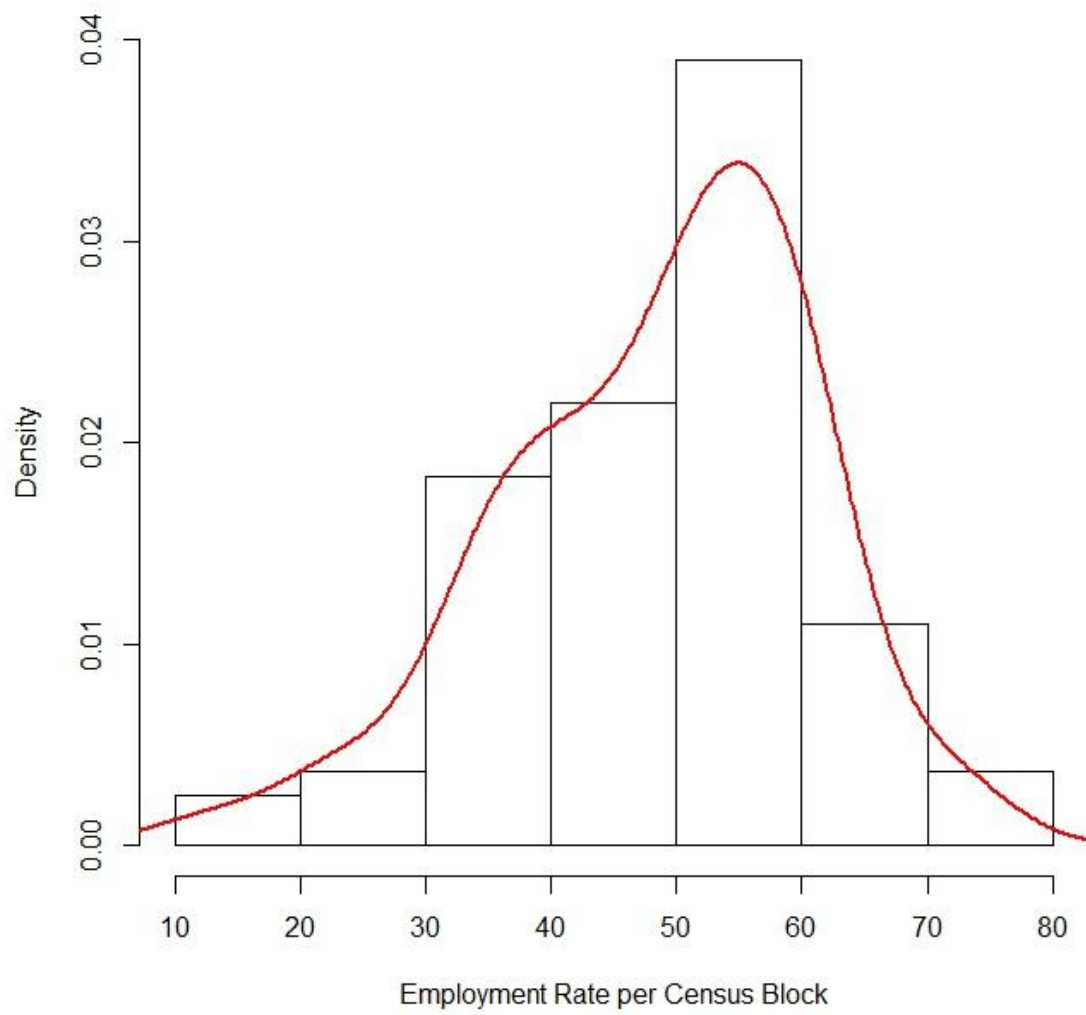


Figure 5: Employment Histogram

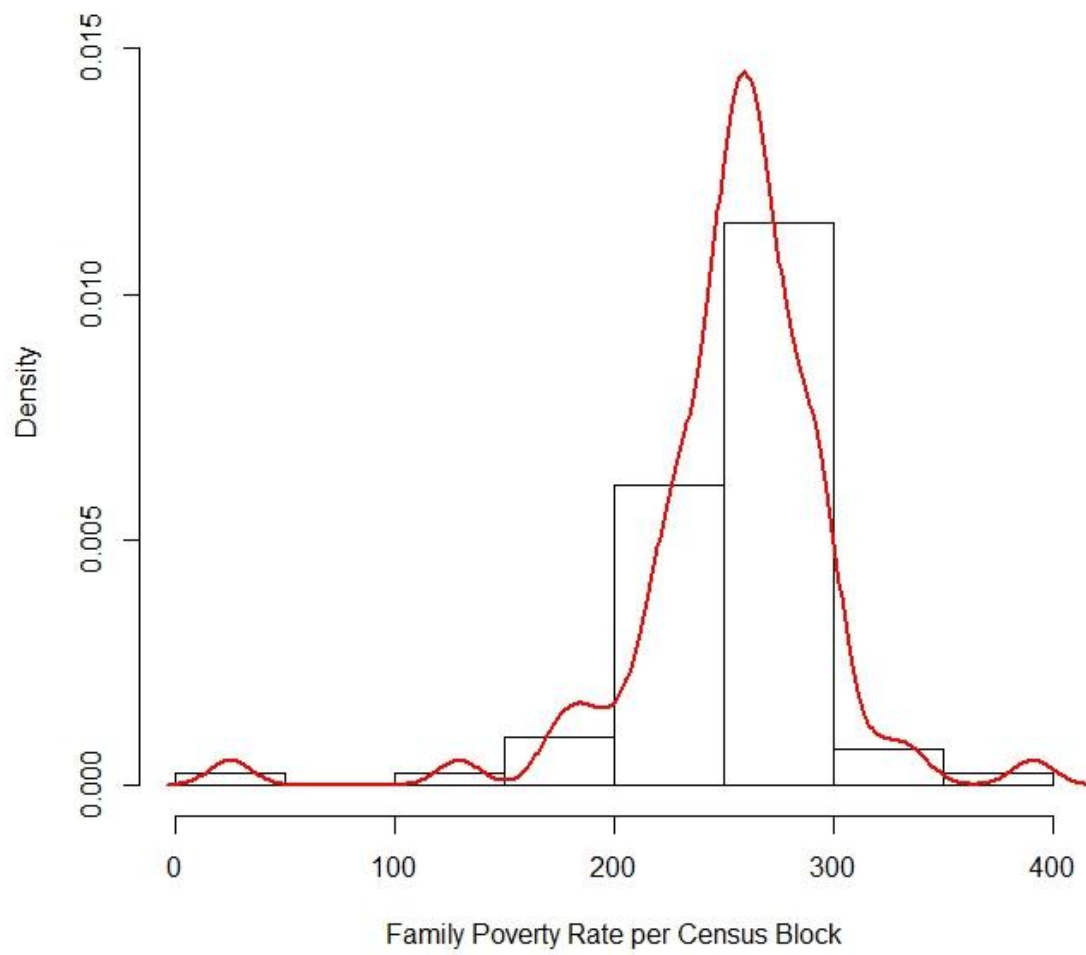


Figure 6: Family Poverty Histogram

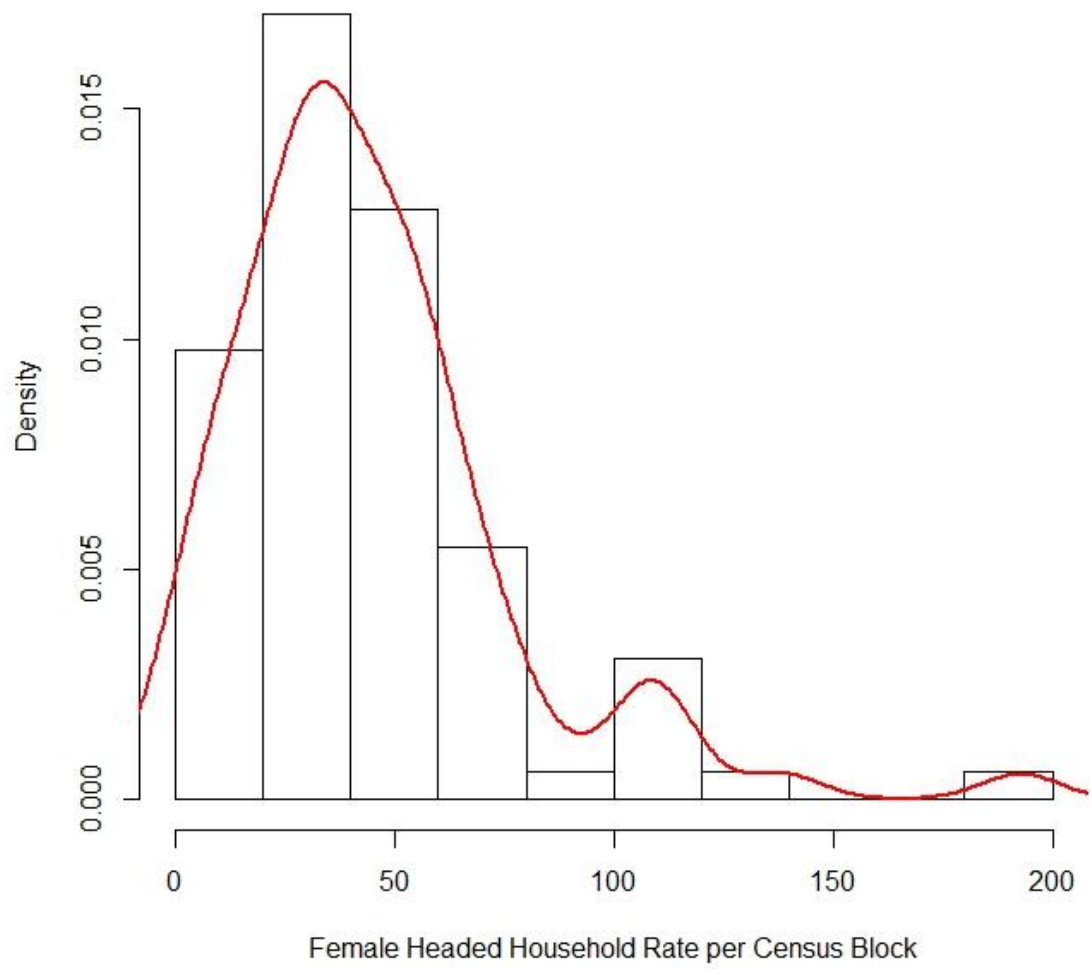


Figure 7: Female Headed Households Histogram

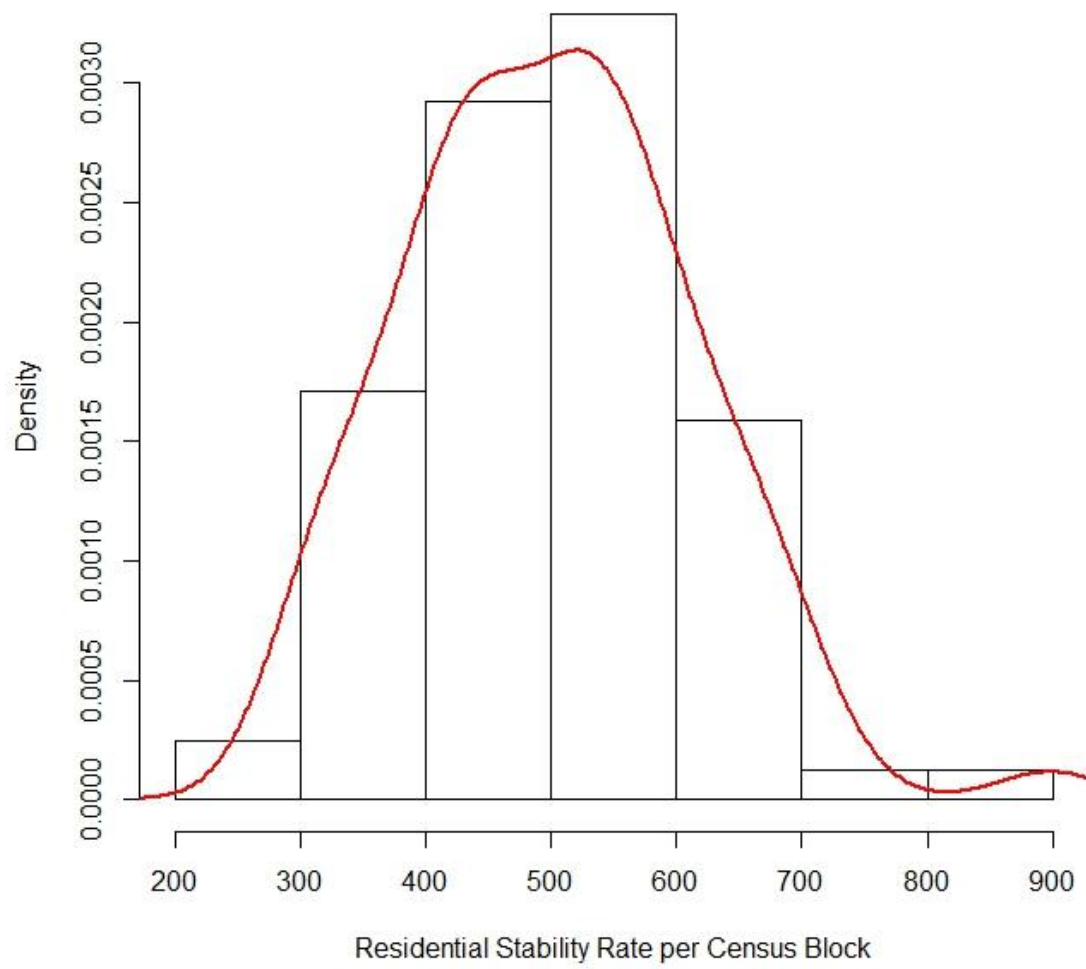


Figure 8: Residential Stability Histogram

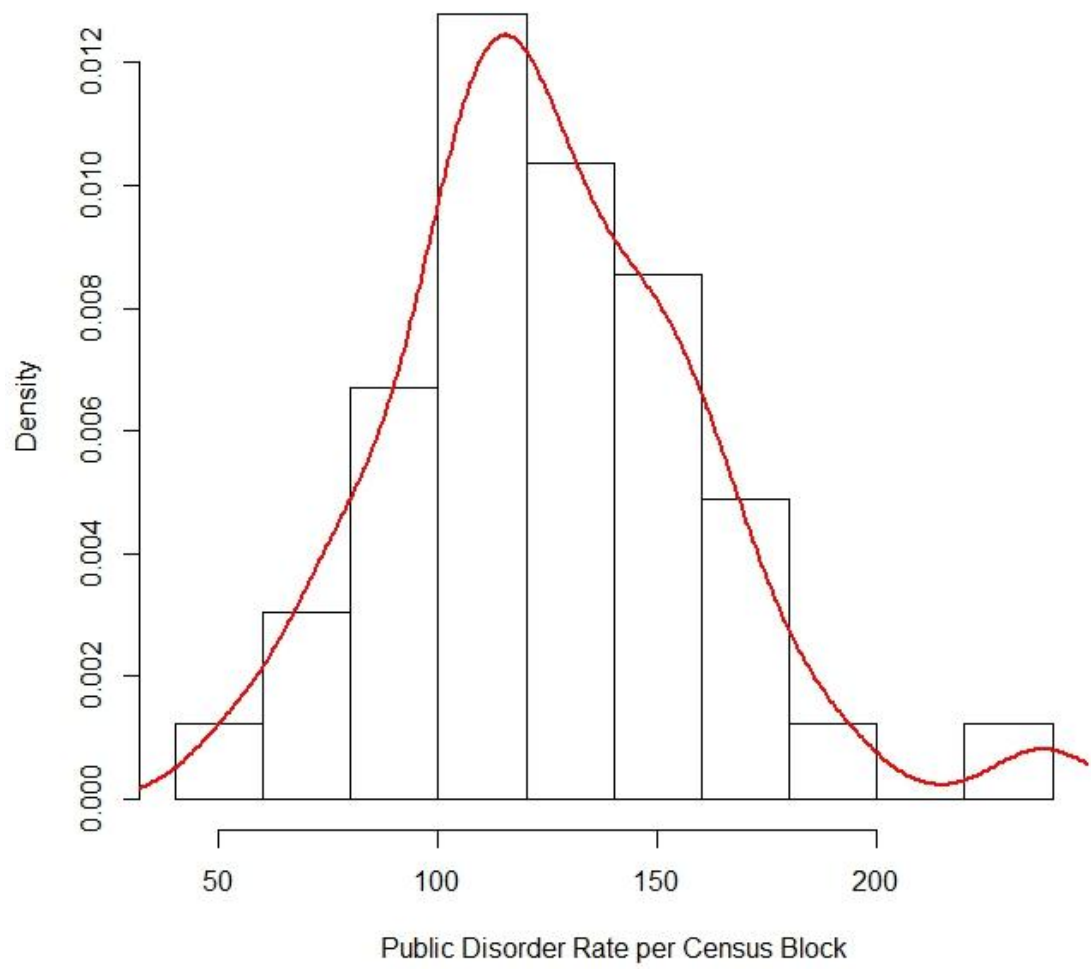


Figure 9: Public Disorder Histogram

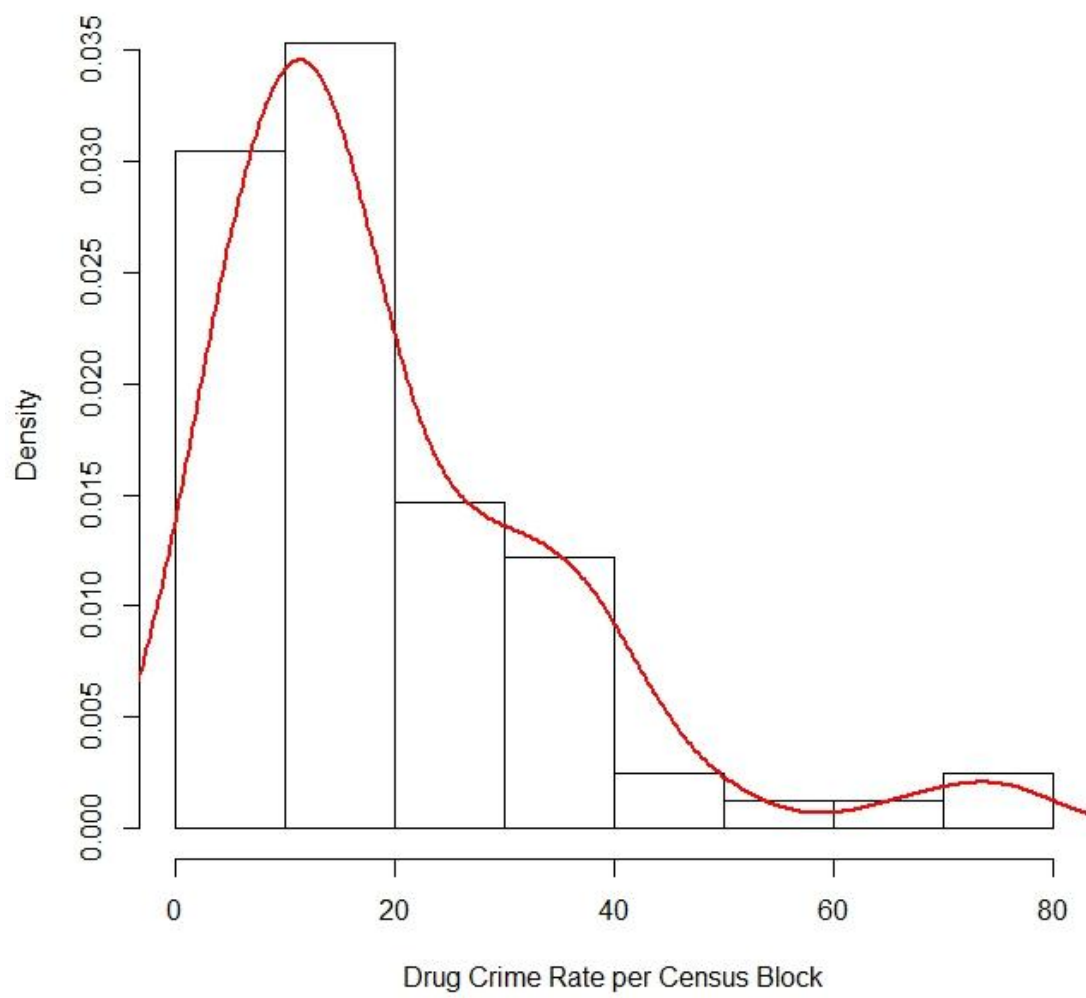


Figure 10: Drug Crime Histogram

Ordinary Least Squares Regression

Table 2 (below) displays the regression coefficients and standard errors for the effects of the social disorganization variables, as well as the effects of public disorder and drug variables, on the use of force rate. In the base model (Model 1), an OLS regression was utilized to determine whether the social disorganization variable(s) (i.e., black percent, employment, poverty, female-headed households, and residential stability) had an effect on the likelihood of use of force. The theoretical model of this study suggests that each of the previously listed social disorganized variables will be significantly related to self-report police use of force incidents.

As shown in the first column of Table 2, two social disorganization variables predicted police use of force in the base model. A one unit increase in the percentage of blacks in a neighborhood (black percent) increased self-reported police use of force incidents by 0.421. In addition, there was a 0.303 increase in self-reported police use of force incidents for each unit of increase in the proportion of families living below the poverty line in a neighborhood. Both of the aforementioned variables were significantly related to police use of force at this stage, with black percent making a slightly larger contribution to the model than family poverty.

The remaining variables, which included employment, female-headed households, and residential stability, did not significantly predict use of force within a neighborhood. Although insignificant in this model, the standardized coefficients for employment and residential stability were in the predicted direction, given the theoretical model of this study. The beta for female-headed households, however, was in the opposite direction. Nevertheless, the base model provided partial support for Hypothesis I, with the social

disorganization variables explaining nearly 24 percent of the variance in police use of force. More importantly, Model 1 suggests that an increase in the percentage of the black population and families living below the poverty line within a neighborhood is associated with an increase in police use of force. Although some of the independent variables in this model did not display a statistically significant relationship with the dependent variable, the Joint F-Statistic, which measures overall model significance, indicates that Model 1 is still a statistically significant model, $F(5, 76) = 6.05, p < 0.001$.

In Model 2, as displayed in the middle column of Table 2, an OLS was utilized to determine whether the disorder variables (drug crime and public disorder) had an influence on a neighborhood's level of use of force. Only one of the disorder variables – the drug rate – was a significant predictor of police use of force. More specifically, a one unit increase in the drug crime rate accounted for 0.342 more self-reported police use of force incidents. Public disorder did not significantly impact the use of force rate in this model. Its standardized coefficient was in the predicted direction, however. Model 2 explained 26 percent of the variance in police use of force. Furthermore, this model indicated that police use of force within a neighborhood is likely to increase as the level of drug crime increases. The findings from Model 2 partially support Hypothesis II, which states that neighborhoods with high levels of public disorder and drug calls for service will have higher levels of use of force. The Joint-Wald Statistic, which measures overall model significance, indicates that Model 2 is a statistically significant model, $F(2, 79) = 15.23, p < 0.001$.

In Model 3, an OLS was utilized to determine which variable(s) – social disorganization, public disorder, or drug crime – exhibited the most influence on the

likelihood of use of force. Black percent and family poverty continue to exhibit statistically significant relationships with police use of force, as both variables did in Model 1. In particular, a one unit increase in the proportion of the black population in a neighborhood causes an increase of 0.451 self-reported police use of force incidents. Likewise, an increase in a neighborhood's level of family poverty is associated with an increase of 0.346 police use of force incidents.

Employment was not related to police use of force. Its standardized coefficient was in the positive direction, which does not align with the theory guiding this study. Female headed households were not a significant predictor of police use of force in Model 3. The beta for female headed households was in the opposite direction to that predicted. The last social disorganization variable residential stability was also an insignificant predictor of police use of force. Its standardized coefficient was in the predicted, negative direction, nonetheless.

The drug crime rate, which was statistically significant in Model 2, is no longer significant in Model 3. Although insignificant, its standardized coefficient was in the predicted direction, given the theoretical model of this study. The public disorder rate displays a significant relationship, in which an increase in a neighborhood's public disorder rate increases police use of force incidents by 0.422. Model 3 indicated that police use of force within a neighborhood will increase as its black population and levels of family poverty and public disorder increase; thereby finding some support for Hypothesis I. Overall, Model 3 appeared to best explain police use of force (39%) compared to Model 1 (23%) and Model 2 (26%). The AIC, which measures model fit, further supports this finding. A lower AIC suggests better model fit and allows

researchers to make better predictions. The AIC for Model 3 (379.78) is considerably lower than the AIC for Model 1 (395.32) and Model 2 (389.05). Thus, Model 3 best explains self-reported police use of force incidents within the City of Roanoke. Also, the Joint Wald Statistic, which measures overall model significance, indicates that Model 3 is statistically significant $F(7, 74) = 75.44, p < 0.001$.

Variable	Model 1		Model 2		Full Model	
	Coefficient (SE)	Beta	Coefficient (Robust SE)	Beta	Coefficient (Robust SE)	Beta
Intercept	1.72 (2.56)		-0.16 (1.47)		-5.97 (3.93)	
Black Percent	0.0379 (0.012)**	0.421			0.041 (0.013)**	0.451
Employment	-0.025 (0.037)	-0.107			0.007 (0.032)	0.031
Family Poverty	0.0197 (0.008)*	0.303			0.022 (0.0098)*	0.346
Female Headed Household	0.001 (0.013)	-0.014			-0.009 (0.011)	-0.099
Residential Stability	-0.005 (0.003)	-0.181			-0.003 (0.003)	-0.100
Public Disorder			0.026 (0.013)	0.308	0.035 (0.013)**	0.422
Drug Crime			0.064 (0.018)***	0.342	0.019 (0.017)	0.104
Adj. Mult R2	0.238		0.260		0.39	
AIC	395.32		389.05		379.78	

Table 2: Model Evaluation Table

After considering the results of the Full Model OLS (see Table 2), an additional OLS was conducted to determine if only using black percent, family poverty, and public disorder would better fit the data. The results of the trimmed model OLS are displayed below in Table 3. Each of the variables continues to display a significant relationship with police use of force.

A one unit increase in the proportion of blacks living within a neighborhood is associated with an increase of 0.439 self-reported police use of force incidents. Also, the number of police use of force incidents increases by 0.287 as a neighborhood's level of families living below the poverty line increases. In addition, a one unit increase in a neighborhood's public disorder rate is related to an increase of 0.425 in self-reported police use of force incidents. The trimmed model OLS explains 40 percent of the variation in police use of force within a neighborhood, which is highest among all of the models which have been tested thus far. The AIC for the trimmed model is 372.64, which is the lowest of all models (Full Model AIC = 379.78). Also, the results of the trimmed model OLS are somewhat supportive of Hypothesis I, which states that neighborhoods with high levels of social disorganization will have higher levels of police use of force.

Variable	Trimmed Model	
	Coefficient (Robust SE)	Beta
Intercept	-5.95 (3.22)	
Black Percent	0.0396 (0.009)***	0.439
Family Poverty	0.019 (0.008)*	0.287
Public Disorder	0.035 (0.013)*	0.425
Adj. Mult R2	0.40	
AIC	372.64	

Table 3: Trimmed Model Evaluation Table

After further considering the results of the trimmed model (Table 3), it was determined that utilizing a GWR analysis would improve the results of the trimmed model. The Koenker statistic, which was rendered from the trimmed model, was statistically significant, which suggests that there are non-stationary relationships between one or more independent variables and the dependent variable (use of force). For instance, black percent may be a strong predictor of police use of force in certain locations but it may be a weak predictor in other locations because blacks may be densely population in one location and relatively sparse in another location (Rosenshein, 2012). Therefore, the remaining portion of the results section will be dedicated to the results of the GWR, which illustrates the location(s) in which black percent, family poverty, and public disorder are the strongest predictors for police use of force in the city of Roanoke.

Geographically Weighted Regression

Prior to performing the geographically weighted regression, a Moran's I test for spatial autocorrelation was conducted. The results of the spatial autocorrelation test were not statistically significant, $z = -0.56$, $p > 0.05$, which indicates that the regression residuals are randomly distributed. More importantly, it appears that the proper variables (black percent, family poverty rate, and public disorder rate) were utilized for the GWR (Rosenshein, 2012).

Table 4 (below) displays the results of the GWR. The GWR allows relationships between variables to vary across locations (i.e., neighborhoods), which violates the assumptions of OLS regressions and allows researchers to make better local predictions. Black percent, family poverty, and public disorder continue to be significantly related to police use of force when reviewing the results of the GWR. A one unit increase in the proportion of blacks living within a neighborhood is associated with a 0.517 increase in self-reported police use of force incidents. In addition, police use of force incidents increase by 0.285 as a neighborhood's level of families living below the poverty line increases. Lastly, an increase in the level of public disorder within a neighborhood is related to an increase of 0.416 self-reported police use of force incidents. The GWR explains 48 percent of the variation of police use of force within a neighborhood, which is eight percent higher than the trimmed model. Therefore, the GWR explains the largest amount of variation in police use of force incidents within a neighborhood of each model employed in this analysis. The AIC for the GWR is also significantly lower than the trimmed model ($364.94 < 372.64$), which signifies that the GWR improved overall model performance (Rosenshein, 2012). More importantly, the trimmed model and GWR

indicate that police use of force is most likely to occur in neighborhoods that contain a large presence of blacks, families living below the poverty line, and public disorder.

Variable	Geographically Weighted Regression Results	
	Coefficient (SE)	Beta
Intercept	-4.95 (1.86)	
Black Percent	0.047 (0.009)***	0.517
Family Povertay	0.019 (0.005)***	0.285
Public Disorder	0.035 (0.007)***	0.416
Adj. Mult R2	0.48	
AIC	364.94	

Table 4: Geographically Weighted Regression Results: Trimmed Model

Figure 11 (below) illustrates the neighborhoods in which black percent is the strongest predictor of police use of force incidents. As the figure displays, black percent is the strongest predictor of police use of force in the northwestern section of the city. The average percentage of blacks living within the neighborhoods which are labeled Very Strong and Strong ($n = 13$) is 35.75, which is significantly larger than the average percentage of blacks residing within the city as a whole ($35.75 > 27.01$). Therefore, it appears that police use of force incidents are more likely to occur in neighborhoods which contain larger proportions of blacks.

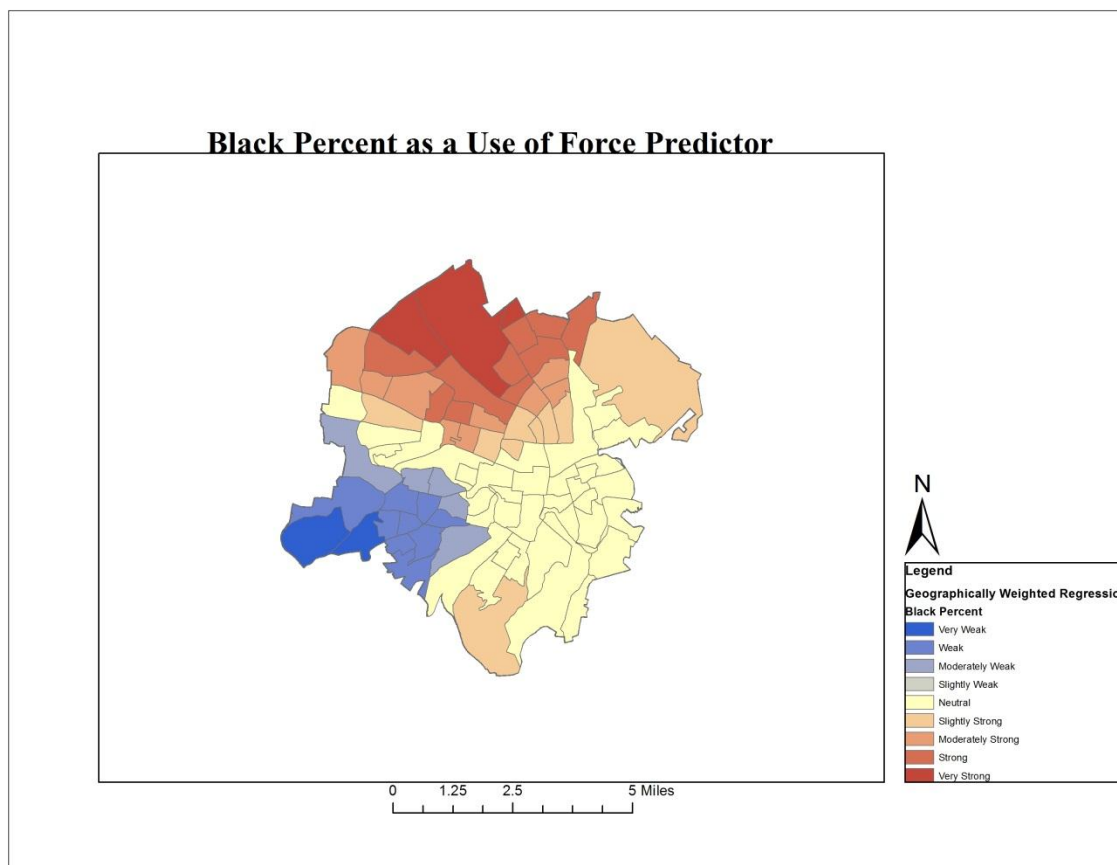


Figure 11: Geographically Weighted Regression Results: Black Percent

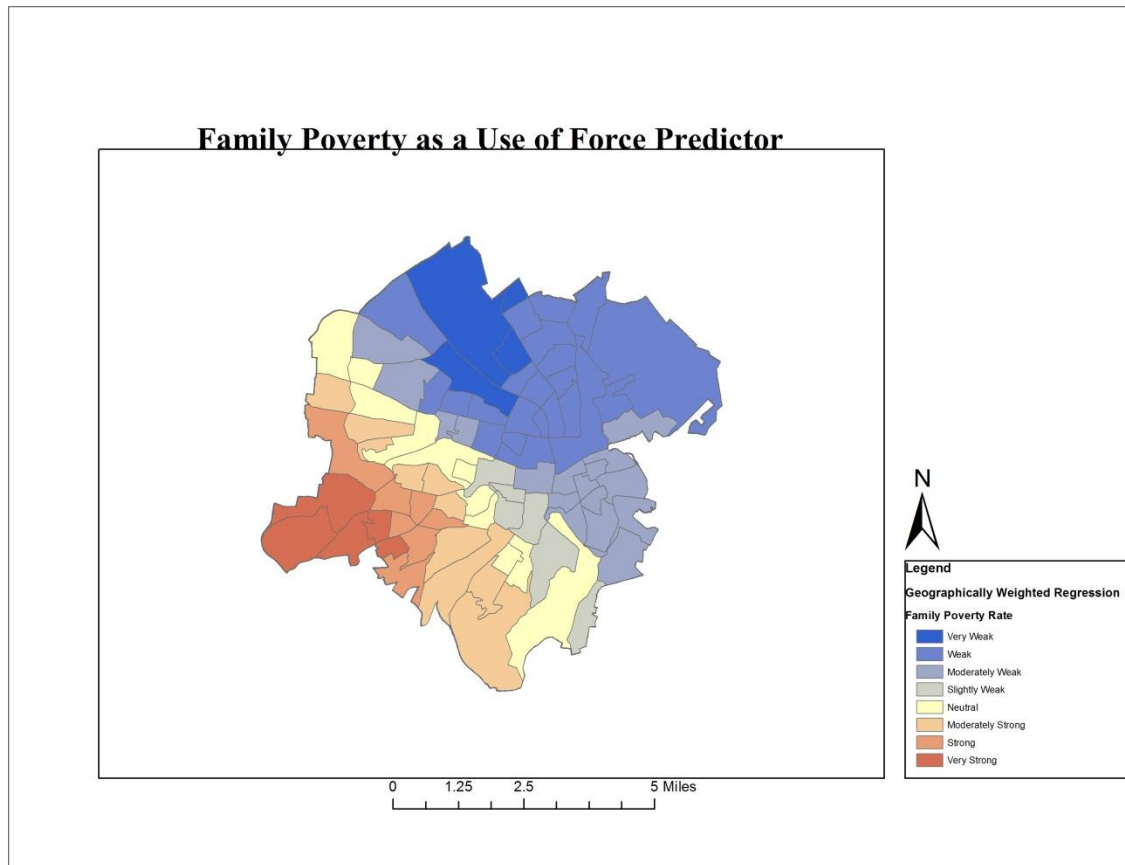


Figure 12: Geographically Weighted Regression Results: Family Poverty

Figure 12 (above) depicts the locations for which family poverty is the strongest predictor for police use of force incidents within the city. The southwestern section of the city is the location in which family poverty has the most effect on police use of force. The average family income in the neighborhoods which have been labeled Very Strong and Strong ($n = 12$) is \$42,476. When compared to the city of Roanoke, the average family income for these 12 neighborhoods is significantly elevated ($\$42,476 > \$31,366$). The theoretical model of this study would predict that police use of force is more likely to occur in neighborhoods which are economically disadvantaged (i.e., lower family income). However, police officers may be more likely to report police use of force

incidents in this section of the city because residents of these neighborhoods are economically advantaged and are more likely and able to file complaints. Thus, police officers may be fearful that residents of economically advantaged neighborhoods will pursue legal actions against the officer(s) involved in a negative police-citizen encounter. This finding is somewhat problematic and makes the researcher question the reliability and validity of the self-reported police use of force reports supplied for this analysis, due to the fact that officers may be more likely to report use of force incidents in economically advantaged areas of the city.

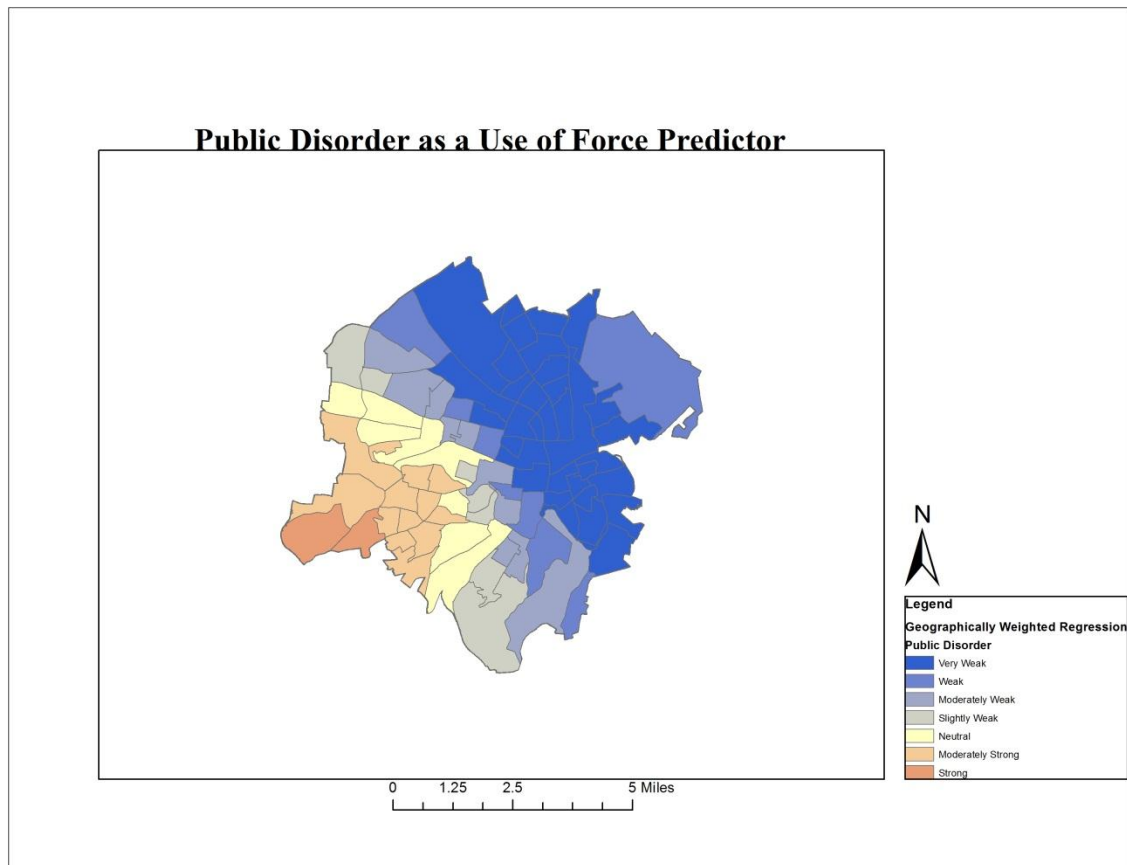


Figure 13: Geographically Weighted Regression Results: Public Disorder

Figure 13 displays the region of Roanoke in which public disorder is a strong predictor of police use of force incidents. As Figure 13 illustrates, public disorder is the strongest predictor of police use of force in the southwestern region of the city. The public disorder rate of neighborhoods which have been labeled Strong and Moderately Strong ($n = 15$) is 111.21. The public disorder rate in these neighborhoods is slightly lower than the public disorder rate for the city as a whole ($111.21 < 125.16$), which does not fully align with the theoretical model of the study. Nevertheless, the same dynamics at play in relation to family poverty (Figure 12) are likely to be responsible for this finding. That is, police officers may be more likely to report use of force incidents in economically advantaged regions of the city for fear of legal consequences. On the other hand, however, police officers may act more aggressively to public disorders in this region of the city because it is economically advantaged and public disorders may be less accepted by the citizens that reside in this area.

Chapter 6: Discussion/Conclusion

As Bittner (1990) claimed, society has authorized police to use force against the citizenry in any situation the police feel it is necessary, and such an authorization is an essential and unique aspect of the police profession. Nevertheless, it was not until the 1960s that scholars began to examine police use of force (Terrill & Mastrofski, 2002; Terrill & Reisig, 2003). Since then, scholars have explored the incidence of deadly force (Jabobs & O'Brien, 1998; Reiss, 1971), civil rights complaints regarding use of force (Holmes, 2000; Smith & Holmes, 2003), and police misconduct (Kane, 2002). More recently, other scholars have examined the use of verbal commands or threats as forms of coercion (Terrill, 2003; Terrill & Mastrofski, 2002; Terrill & Reisig, 2003).

This study is most concerned with social disorganization theory and its applicability to police use of force. More importantly, this analysis was intended to examine the geographical pattern of police use of force, specifically to see if socially disorganized neighborhoods have higher levels of use of force. That is, do the characteristics of a location impact the likelihood that force will occur during a police-citizen encounter? Social disorganization theory postulates that urban areas have higher rates of crime because such locations are plagued by high rates of male joblessness, poverty, family disruption, residential instability, and may lack collective efficacy. Nevertheless, scholars have recently begun to utilize the social disorganization framework to examine police use of force. Consistently, researchers have found use of force to be higher in socially disorganized communities (Parker et al., 2005; Smith, Sun, Payne & Wu, 2008; 1986; Terrill & Reisig, 2003).

The results of this analysis lend some support to the findings of previous research and the notion that the characteristics of a location matter. Officers may be more apt to use force in certain locations because officers identify locations as “bad” or crime ridden and interpret individuals encountered in such areas as certain “kinds of people” indicative of those locations. The findings suggest that officers act more coercively in socially disorganized neighborhoods. A series of regression models revealed that three social disorganization variables were significant predictors of self-reported police use of force incidents. The fact that other social disorganization variables were not significantly related to police use of force may raise some questions. However, this may be due to a measurement issue or the fact that those variables do not play a significant role in self-reported police use of force incidents in the city of Roanoke. After reviewing the results of the Full Model OLS, which included all variables utilized in this study, it was determined that black percent, family poverty, and public disorder were significantly related to self-reported police use of force. An additional trimmed model was employed in which black percent, family poverty, and public disorder were included and each variable continued to be significantly related to police use of force. The trimmed model explained 40 percent of the variation in police use of force and it produced the lowest AIC off all OLS models ($AIC = 372.64$). After selecting the best OLS model – the trimmed model – a geographically weighted regression was conducted to further enhance the results of this study ($AIC = 364.94$). Findings from the GWR further support the notion that officers act more coercively in poor, black neighborhoods that are plagued by public disorder. In addition, the GWR allowed the researcher to identify the locations of the city in which black percent, family poverty, and public disorder were the strongest

predictors of self-reported police use of force. Overall, it appears that police officers act more coercive in minority, economically disadvantaged, and disordered neighborhoods.

While the results of the OLS regressions partially support the idea that police act more coercively in socially disorganized neighborhoods, the GWR results paint an entirely different picture. The results of the OLS regressions would indicate that the social disorganization variables would be significant related to use of force in strictly poor, black, and disordered neighborhoods. This is due to the fact that OLS regressions are “global” models. That is, OLS regressions do not take into account the fact that variables may have different levels of influence across locations (e.g., neighborhoods). GWR does, however, account for spatial non-stationarity or the fact that relationships between variables may vary from location to location (Mennis, 2006, p. 1). Thus, use of a GWR in this study allowed the researcher to identify different location(s) where there was a significant relationship between use of force and black percent, family poverty rate, and public disorder rate.

The finding in the northwestern region of the city, in which officers act more coercively in neighborhoods with relatively high concentration of blacks, may be due to the aggressive and violent demeanor of citizens encountered in such communities. Recall the “code of the street” propositions put forth by Anderson (1997), which suggests that minority, inner-city residents are more likely to act in an aggressive and violent manner because such residents do not want to look “weak” among peers and due to a lack of trust in law enforcement. Residents of these communities may be more likely to act aggressively, disrespectfully, or antagonistically during a police-citizen encounter, which previous research has found to be significant predictors for police use of force (Bayley &

Mendelsohn, 1969; Sherman, 1980; Smith, 1986; Sun, Payne, & Wu, 2008). Also, police officers may be more likely to use force against citizens encountered in “black neighborhoods” because the officers tend to expect all individuals that reside in disadvantaged neighborhoods to respond aggressively toward the police and perceive such areas as threatening to their safety (Bayley & Mendolsohn, 1969; Smith, 1986).

The findings in the southwestern region of the city, in which family poverty and disorder were significantly related to self-reported police use of force incidents, appear to be more complex. Recall that the average family income for this area was higher than the average family income for the city as a whole (\$42,476 > \$31,366). However, family poverty and public disorder display are significantly related to use of force incidents in this area. This may be due to the fact that there are “pockets of poverty” within this region of the city. Relative deprivation theory suggests that certain neighborhoods or communities exhibit higher rates of crime because there are significant disparities in the economic wellbeing among neighbors. Those less fortunate become frustrated with their current social status, which causes those individuals to engage in criminal behavior to increase their economic wellbeing (Eberts & Sehwirian, 1968). Thus, relative deprivation between neighbors may increase crime within neighborhoods in the southwestern region of the city, which increases the likelihood that the police will be called upon to reduce crime and disorder in this region. Ultimately increasing police-citizen interactions and elevating the likelihood of self-reported police use of force incidents.

In addition to relative deprivation, police may react more aggressively to disorders in the southwestern region of Roanoke because it is economically advantaged and public disorders may be less accepted by the citizens that reside in this area,

particularly if the individual is lower class and minority. Also, police officers may be more likely to report use of force incidents in economically advantaged regions of the city for fear of legal consequences due to the fact that advantaged individuals have the economic resources to file complaints and utilize the court system to challenge officers' decision to use force.

Policy Implications

In terms of policy implications, improving police-community relations should be a focal point for law enforcement departments (Bayley & Mendelsohn, 1969; Parker et al., 2005). Such relations are “especially important in racially stratified cities where residents have lost a sense of mutual obligation and trust” and “informal social controls have been decimated” (Parker et al., 2005, p. 71). Thus, police department must reach out to the communities they serve and attempt to mend the “broken” relationships between residents of disorganized neighborhoods and the police. Also, the police must be more understanding of the social ills plaguing many inner-city residents and not apply force unduly against them. Potentially, cultural diversity training could reduce the incidence of force in neighborhoods that contain higher concentrations of black residents and relieve much of the friction between inner-city residents and police officers (Terrill & Mastrofski, 2002). More specifically, it would worthy for the department to implement cultural diversity training that focuses on informing officers about the code of the street (Anderson, 1997) so officers may become more understanding of the “code” and be better equipped to handle such situations.

In addition, the Roanoke Police Department should consider implementing Community Policing strategies in the southwestern region of the City. Although this

region is considered to be economically advantaged, it is likely that there are “pocket of poverty” within this region, which explains why family poverty and public disorder are significant predictors of use of force in this area. Using force against the economically disadvantaged areas of the southwestern region reinforces the belief that those residing in such areas are being “deprived” of positive or expected resources (i.e., public safety), thereby increasing the feelings of relative deprivation. Implementing Community Policing strategies would likely reduce resistance to law enforcement in the “pockets of poverty” of the southwestern region and increase positive perceptions of the Department. Thus, reducing the feelings of being deprived of public safety, which would likely reduce the resistance to law enforcement and the likelihood that force will be used in a police-citizen encounter.

Also, while the unit of analysis for this study was the neighborhood/census block, an individual level implication may be worth noting. Police departments may wish to institute an educational requirement in order for officers to be eligible for employment (Terrill & Mastrofski, 2002). In particular, hiring officers possessing an associate’s or bachelor’s degree may reduce use of force. Officers who have received higher education (i.e., beyond a high school diploma) are less likely to utilize force when encountering citizens (Rydberg & Terrill, 2010). Perhaps police department accreditation could play a vital role in reducing use of force. Parker et al. (2005) reported that departments which were nationally accredited have lower levels of force compared to agencies that are not. This may be due to the fact that nationally accredited organizations have more stringent “hiring and training requirements [that] produce more professional police officers” who resort to force less often during police-citizen encounters (p. 71).

Limitations

This study has increased the knowledge base of individuals interested in police use of force. However, as with any study, there are limitations to the present analysis. First, it may be difficult to generalize the findings due to the fact that the data was gathered from a single department. Therefore, it may not be representative of police departments throughout the state of Virginia or across the United States. In addition, a police use of force incident is an individual-level interaction. However, police use of force was analyzed at the neighborhood-level throughout the present analysis. While this is a limitation of the current study, the findings from this analysis still provide us with a greater understanding of the “kinds of places” where police officers are more likely to use force. Also, the theoretical model utilized for this analysis may be misspecified. The Jarque-Bera Statistic, which was rendered during the Model 3 OLS regression, was statistically significant ($p < 0.001$). When the Jarque-Bera Statistic is statistically significant, it indicates that a model is missing one or more important independent variables, which may have caused the estimates of this analysis to be biased (Rosenstein, 2012). For example, suspect/citizen resistance may have increased the researcher’s ability to predict police use of force, but was not included in the analysis. Lastly, there was a positive skew in the residuals, which may make the theoretical model utilized in this study an unstable predictor.

Directions for Future Research

One of the most important conclusions from this study revolves around the disparate findings between the OLS regressions and GWR results. The OLS regressions provided partial support for the idea that police officers are more likely to use force in

socially disorganized neighborhoods. However, due to the fact that OLS regressions model relationships for the study area as a whole, it does not account for non-stationarity. Notwithstanding, the results of the GWR completely dismantle the simple idea that officers act more coercively in disorganized neighborhoods, as illustrated by the relationship between self-reported police use of force and family poverty and disorder in the southwestern region of Roanoke, which is a relatively advantaged and economically fortunate area. Therefore, future research should incorporate geographically weighted regression analyses when examining community-level variables and police use of force.

While the geographical pattern of police use of force was the focus of this study, it would be useful for future research to include a measure of suspect/citizen resistance. Previous research has indicated that suspect/citizen resistance significantly predicts police use of force. (Sherman, 1980; Smith, 1986; Sun, Payne, & Wu, 2008). Officers tend to view hostile, resistant, or antagonistic behavior as a challenge to the authority of officers, which significantly increases the likelihood that officers will utilize force to assert their authority (Reiss, 1971). Possibly requesting police officers to respond to a survey or questionnaire will provide the field of academia with a “better understanding of officers’ views toward neighborhoods and how such views may prompt their decision-making behavior” (Terrill & Reisig, 2003, p. 309). This will allow researchers to examine how neighborhood context impacts police use of force.

Although this study has increased the knowledge base regarding police use of force in socially disorganized neighborhoods, it is vital for scholars to consider utilizing sociological perspectives into future analyses of police use of force. Doing this will likely

produce important information regarding the topic and provide scholars with a better understanding of the dynamic processes at play.

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