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Exploring the Structural and Organizational Correlates of Police Use of Force in a National

Sample of Law Enforcement Agencies

Jennifer Burbridge

Master's Thesis

Seattle University

Masters of Arts in Criminal Justice

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Abstract

The purpose of this study is to determine organizational and structural correlates of police use of force using the 2013 Law Enforcement Management and Administrative Statistics (LEMAS) data. Conducted periodically since 1987, LEMAS is a nationally representative survey in which the Bureau of Justice Statistics collects data from over 3,000 state and local law enforcement agencies regarding topics such as agency operations, responsibilities, demographic information of officers and added in 2013, police use of force. Using 2013 LEMAS data, this study attempts to determine what organizational and structural factors of police organizations and the municipalities in which they serve, lead to higher levels of police use of force. Potential policy implications of this study include enhanced understanding of the national issue of data collection on police use of excessive force. Results suggest corrective and restorative actions.

Police use of force is an important topic of study in two respects: first, police use of force is theoretically important because it involves the exercise of coercive authority by the state; second, it is practically important because it affects society's reaction towards the police and the government (Friedrich, 1980) and is therefore connected with public assessments of police legitimacy. Some scholars have argued that police use of excessive force, whether lethal or not, has become a significant social problem in the United States (Arthur, 1993; Phillips & Smith, 2000; Rappert, 2002). More recently academics have claimed that police officers' use of deadly force is the most radical form of coercive power available to them (Willits & Nowacki, 2014). In the last three decades in the United States many significant incidents, including the beating of Rodney King in 1991 in California, the fatal shooting of Michael Brown in 2014 in Missouri, the fatal choking of Eric Garner in 2014 in New York, and the fatal shooting of Walter Scott in 2015 in South Carolina, have sparked a national debate regarding police use of force and what police agencies, as well as researchers can do to predict and possibly prevent future incidents.

Numerous scholars from varying disciplines have examined the overarching topic of police use of force, however this study focuses on the measurement of police use of force and the explanatory/predictive factors of police use of force incidents (Alpert & Smith, 1994; Atherley & Hickman, 2014; Bolger, 2015; Castillo et al., 2012; Chapman, 2012; Friedrich, 1980; Garner, Maxwell & Heraux, 2002; Hickman & Piquero, 2009; Hickman, Piquero & Garner, 2008; Jacobs and Britt, 1979; Klahm, Frank & Liederbach, 2013; Moore & Braga, 2004; Lee et al., 2010; Rushin, 2015; Schatmeier, 2013; Shane, 2008; Taylor et al., 2010; Terrill, 2005; Willits and Nowacki, 2013; Wolf et al., 2009). This study will also examine how organization theory and more specifically, how organization structure and culture contributes to factors predictive of use of force incidents (Blau, 1970; Chan, 1996; Hassell, Zhao & Maguire, 2003; Hofstede et al.,

1990; Lee et al., 2013; Mastrofski & Willis, 2010; Myhill & Bradford, 2012; Myren, 1960; Shafritz, Ott & Jang, 2016; Willits, 2014; Wilson, 1968; Wilson, 2003).

While many subtopics of police use of force have been investigated in recent research, little existing research has explored organizational, as well as structural correlates and to date, the new 2013 LEMAS data on American police department's use of force has not yet been analyzed. This study will directly address this gap in the literature through the analysis of 2013 LEMAS data, including the new section on police use of force, to ultimately discover organizational and structural correlates of police use of force incidents. While the primary focus of this study is the organizational and structural elements of police organizations that could explain police use of force, it is important to note a possible secondary research question. Due to the fact that the new 2013 use of force section on the LEMAS survey has yet to be analyzed, another research question that will be explored is the validity of the LEMAS Use of Force section and the correlates of reporting use of force incidents. It is possible this analysis will reveal problems in the LEMAS data, and as such, this secondary research question may become necessary to explore. Regarding the subtopic of the validity of the 2013 LEMAS use of force data, Apuzzo and Cohen (2015) published an article in *The New York Times* criticizing the Bureau of Justice Statistics and the new use of force section, stating that LEMAS data is "almost useless", this article points to potential issues associated with the LEMAS Use of Force data and any data regarding police use of force incidents. These writers brought up the fact that the Obama Administration has been pushing for better data, however there is still no national requirement to record use of force incidents, nor is there a requirement to report or otherwise release these records. Rather than simply rely on *The New York Times* opinion, it is important to further analyze the 2013 LEMAS use of force data and truly determine the utility of these data.

This study will first offer a review of existing literature on police use of force, including the topics of measurement and predictive and explanatory factors, as well as a review of literature on organizational theory and organizational culture. The method that will be used to assess the correlates of police use of force incidents will then be provided. Next, the results of the extensive statistical analysis completed in this study will be presented and lastly, overall conclusions, policy implications and opportunities for future research will be discussed. The primary purpose of this study is to expand the current academic understanding of correlates of police use of force incidents, as well as develop a better understanding of use of force data such as the data generated by LEMAS; this study may also be able to offer policy implications for training and/or management of law enforcement agencies.

Literature Review

Prior to delving into the methods of the present study, it is first crucial to explore existing research and literature on three main topics of interest; research on the measurement of police use of force, explanatory/predictive factors of police use of force, and organizational structure and culture.

Measurement of Police Officer Use of Force

The first area to explore in this study is the measurement of police use of force; this includes the importance of the type of measurement, the different types of measurements used and the significance of explicitly defining what is meant by use of force (Alpert & Smith, 1994; Atherley & Hickman, 2014; Castillo et al., 2012; Garner et al., 2002; Hickman, Piquero & Garner, 2008; Klahm et al., 2013; Moore & Braga, 2004; Rushin, 2015; Schatmeier, 2013; Shane, 2008; Taylor et al., 2010; Terrill, 2005; Wolf et al., 2009). Measurement of police use of force is the most critical issue in this area of research and the new 2013 LEMAS section's aim is to refine and test a measurement scheme for uses of force. A few researchers have asserted that practically everything within policing is subjected to measurement, that the public have long been yearning for a more reliable way to measure police performance and that police use of force is no exception to this (Moore & Braga, 2004; Shane, 2008).

Klahm et al. (2013) provided a systematic and thorough meta-analysis of 53 police use of force related studies that were published in peer-reviewed journals; these researchers found that the concept of police use of force was extremely ambiguous, as 72 percent of their sample did not cite a concise conceptual definition of this construct. Klahm et al. argued that this ambiguity leads to issues with interpretation and has created a block of literature that has seemingly contradictory findings; they further argued that if police use of force research is to inform policy,

there must be a consistently used definition and understanding. Terrill (2005) insisted that police use of force research must consider and measure the extent to which force is applied proportionately and incrementally, before one can deem a use of force as excessive. Terrill examined 3,544 police-suspect encounters in order to ultimately better understand the transactional process taking place and found that, “within the context of a force continuum structure, that officers escalated the level of force in about one of five encounters involving nonresistant suspects, and de-escalated the level of force in three of four encounters involving resistant suspects” (p. 107).

Force must not be thought of as a static concept and in order to fully appreciate the complexity of incidents where police officers utilize different amounts of force, it is important to think of force as a continuum (Terrill, 2005; Wolf et al., 2009). For purposes of analysis, Wolf et al. (2009) developed a force continuum following the “force factor” approach earlier developed by Alpert and Dunham (1997), that was made up of three levels of force and they overall found that, similar to previous studies, police officer levels of force are consistently lower than suspect resistance levels. Garner et al (2002) stressed the importance of the measure of force used; these researchers argued that, “future research will be stronger if it goes beyond the use of single measures that are unique to each study and tests the strengths of theories across multiple measures of force” (p. 742). Taylor et al. (2010) measured a multitude of use of force variables and stressed the importance of measuring a variety of issues including non-lethal weapon use, the number and level of force used by law enforcement agencies, complaints of excessive force and injuries to both officers and suspects (p. 211). In 1994, Congress the Violent Crime Control and Law Enforcement Act that allows the U.S. Attorney General and the Department of Justice (DOJ) authority to launch structural reform litigations within police departments with systematic

misconduct and unconstitutional policing actions, including but not limited to excessive uses of force (Rushin, 2015; Schatmeier, 2013). Schatmeier (2013) stated that the DOJ has used this authority to “investigate, sue, and enter into contractual agreements with police agencies as a means of reforming unconstitutional police practices, such as excessive use of force, racial profiling, and unconstitutional stop-and-frisk practices” (p. 539). Schatmerier went on to discuss the success that the Cincinnati Police Department (CPD) had related to measurable progress while under an agreement with the DOJ; CPD emphasized the importance of principles such as democratic experimentalism, goal-oriented and flexible approach and structural transparency.

Injury as a measurement of the degree of force. In recent years, various scholars have suggested and explored a myriad of methods for identifying acts of unnecessary and/or excessive force (Atherley & Hickman, 2014). Atherley and Hickman specifically presented a prototype method, which they called Graham Factor Filtering (GFF), “The GFF method does not explicitly identify excessive force cases, rather, the method identifies cases which potentially lack justification (under Graham) and subjects them to additional scrutiny” (p.126). In their rigorous analysis of 1,240 use of force reports from the Seattle Police Department utilizing their proposed method, these researchers found that although GFF could assist in the identification of possible excessive force incidents for further review, this identification method could not stand alone. Law enforcement officials utilize use-of-force tactics in order to gain or maintain control of suspects (Castillo et al., 2012). The purpose of Castillo et al.’s study was to assess factors related to officer and suspect injuries during use-of-force incidents and found that resistance and force used to prevent a violent felony were most correlated with suspect injury and the suspect having a weapon and suspect resistance was most associated with officer injury. Hickman, Piquero & Garner (2008) in their analysis of the Police-Public Contact Survey (PPCS) and the Survey of

Inmates at Local Jails (SILJ) found that police use or threaten force in 1.7% of all interactions with offenders and 20% of all arrests. These researchers also found that while males, youths and racial minorities report greater rates of police use of force, however their models did call attention to the role of potentially provoking behaviors on the likelihood and severity of force used by police officers. “The authority of the police to use force represents one of the most misunderstood powers granted to representatives of government” (Alpert & Smith, 1994). Alpert and Smith (1994) argued that in American police departments, there is an unrealistic expectation that police officers must understand, interpret and follow extremely vague ‘reasonableness’ guidelines when it comes to use of force decisions.

Explanatory/Predictive Factors of Police Use of Force

Starting in the 1970’s, criminal justice, psychology and sociology scholars started aggressively looking at police use of force and have since attempted to uncover and describe the explanatory and predictive factors. Jacobs and Britt (1979) applied conflict theory to police use of force and tested the hypothesis that control agents of the state (i.e. police officers) are more likely to use excessive or extreme force in places where economic inequality is most prominent. Even after controlling for six additional explanations of use of force, these researchers found that police officers were indeed more likely to use deadly force in states with high economic inequality. The most profound implication of this study is that a hypothesis gleaned from conflict theory can predict police-caused homicides. Friedrich (1980) reanalyzed Albert J. Reiss’s observational data from 1966, and from his analysis, he argued that only the behavior of the offender and the visibility of the interaction to the officers’ peers and/or the public, are significant influences on police officer use of force.

Lee et al. (2010) expanded on Friedrich's work and examined police use of force looking for individual, contextual and organizational factors. These researchers found that age of arrestee and arrestee's resistance were significant individual level variables, violent crime rate and unemployment rate were significant neighborhood level contextual variables and in-service training was a significant organizational level variable to police use of force. Much like Lee et al., Willits and Nowacki (2013) examined organizational and structural predictors of police use of deadly force for both small and large cities in the United States through an analysis of Supplementary Homicide Reports, census data and LEMAS data. These researchers found that organizational characteristics were important predictors of the use of deadly force for both small and large cities, organizational context and organizational complexity variables were only significant predictors for cities with populations greater than 100,000 people and that solely professionalism variables influenced use of deadly force in small cities in their sample.

Hickman and Piquero (2009) analyzed 2003 LEMAS data from 496 large municipal police departments, in order to ultimately explore minority representation and other organizational, administrative and environmental correlates of citizen complaints of police use of force. These researchers found that, "rates of force complaints were higher among agencies having greater spatial differentiation, internal affairs units, and higher violent crime rates... and minority representation was unrelated to complaint rates nor the percentage of complaints sustained" (Hickman & Piquero, 2009, p. 3).

Chapman (2012) explored police use of force in three mainly minority US cities and his results suggested a few important individual level factors related to patrol officers and their use of force. Chapman found that among patrol officers, higher education predicted less use of force, and across all duties, without controlling for age, younger officers used more force, but when he

did control for age, more experienced officers used more force. As the quality and quantity of use of force data increases over time, more researchers have begun to analyze police use of force decisions. Bolger (2015) conducted a meta-analysis in order to identify the key correlates to police officer's decision to use force; he found that characteristics of the encounter were most strongly correlated with use of force decisions and argued that future theories of use of force should focus on these characteristics. Using police officers' self-reported data from 7,512 adults arrests in six different jurisdictions, Garner et al. (2002) found that the relationship between encounter-level characteristics and police officer use of force are contingent on the blend of the amount of resistance employed by the suspect and the measure of force utilized in that case.

Potential policy implications for police organizations. Within the broad scope of explanatory factors of police use of force, a few researchers have provided potential policy implications for police organizations (Lindgren, 1981; MacDonald, Kaminski & Smith, 2009; Manning, 1980; Reiss, 1980). Macdonald, Kaminski & Smith (2009) explored the use of non-lethal weapons on the prevalence and incidence of injuries to police officers and citizens in situations involving use of force. They found that use of non-lethal weapons significantly lowered the possibility of injury and they overall argued for the use of non-lethal weapons instead of physical force. Manning (1980) stated that violence and deadly force are often viewed as a commonsense part of police officers' role in society; however he argued that as a society, we must question it. Related to policy and social reforms, Manning asserted that, "Given the occupational basis for violence, macro-social changes such as gun law control or the differentiation of the police role seem, if not promising, at least possible reforms" (p. 135). Garland (2001) also described macro-social changes that must occur to impact the crime-control model of criminal justice and policing,

Social and political theorists have long argued that effective government in complex societies cannot rely upon centralized command and coercion. Instead it must harness the government capacities of the organization and associations of civil society, together with the local powers and knowledge that they contain. We are discovering—and not before time—that this is true of crime control as well. (p. 205)

Reiss (1980) argued that the government should take a more substantial role in controlling police officer use of deadly force by controlling the opportunity of force. He insisted on an altering of government organizations and stated that current use of force management strategies have distinct limits. Much like Reiss, Lindgren (1981) argued that police organizations must do a better job of controlling use of force. Lindgren contended that a police officer's decision to use deadly force is not easily controlled by their organizational or agency management, but however difficult, police organizations must more effectively restrict the use of force against fleeing felons in order to reduce police use of deadly force.

Organizational Theory: Structure and Culture

Shafritz, Ott and Jang (2016) contend that there is no such thing as the theory of organizations; rather, there are a multitude of theories that seek to describe and forecast how organizations and the individuals within them will react in different organizational structures, cultures and conditions. Organizational culture is described as the culture that exists within an organization and it is often made up of abstract phenomena, such as values, ideologies, perceptions, assumptions, behavioral norms and patterns of behavior (Shafritz et al., 2016, p. 292). Blau (1970) discussed organizational structure and differentiation within organizations; he argued that “The expanding size of organizations give rise to increasing subdivision of responsibilities, facilitates supervision and widens the span of control of supervisors, and

simultaneously creates structural differentiation and problems of coordination that require supervisory attention” (p. 201). Blau’s paper constructed a structured and methodical theory of differentiation within organizations, and this theory was made up of two basic generalizations and nine propositions obtained from them. The two basic generalizations that Blau explored were: generalization one- as organizations increase in size, differentiation is a result, along various lines at decelerating rates and generalization two- one consequence of differentiation is an enlargement of the administrative component within organizations (p. 201).

Hofstede et al. (1990) conducted qualitative and quantitative research of ten different organizations in Denmark and the Netherlands to ultimately uncover varying organizational cultures. These researchers found that a large majority of the difference in culture across organizations can be explained by six factors related to the organizational structure and culture; factor one: process-oriented versus results oriented, factor two: employee-oriented versus job-oriented, factor three: parochial versus professional, factor four: open system versus closed system, factor five: loose control versus tight control and factor six: normative versus pragmatic.

Police culture has been thought to be a substantial obstacle to police reform (Chan, 1996). However, Chan (1996) argued that this concept of police culture has been inadequately defined and offers little analytic benefit. Chan drew up on Bourdieu’s concepts of field and habitus and utilized a theoretical framework in order to propose a revolutionary way of conceptualizing police culture; a method that recognizes that police culture is a result of the interaction between the field of policing and the numerous aspects of police organizational knowledge (p. 109). American police organizations illustrate both organizational continuity and organizational change (Mastrofski & Willis, 2010; Myren, 1960). Mastrofski and Willis argued that the complexity of the dynamics of change reveal themselves within American police organizations’

reactions to two significant reform trends: community policing and terrorist-oriented policing (p. 55). These scholars further claimed that police agencies have displayed an exceptional aptitude to incorporate these reforms into their departments while still shielding fundamental practices and structures from substantial change.

Hassell, Zhao and Maguire's (2003) study tested Wilson's 1968 theory of political culture's affect on police agency's structure and culture; based on an empirical study conducted in the 1960s, Wilson found that local political culture can partially explain the variation in the structural arrangements of law enforcement organizations (Wilson, 1968). Hassell et al.'s study attempted to test Wilson's theory, to ultimately discover if his theory had validity over 30 years after it was proposed; from their analysis of a sample of large municipal police departments in the United States, these researchers found that Wilson's theory indeed has contemporary validity and they also found four dimensions of organizational structure that political culture did not have an affect on: formalization, vertical differentiation, functional differentiation and centralization.

Many researchers and scholars in recent decades have explored aspects of police organization structure and culture (Lee et al., 2013; Myhill & Bradford, 2012; Willits, 2014; Wilson, 2003). Myhill and Bradford (2012) examined theories of organizational justice in the context of police agencies and utilized Structural Equation Modeling in order to analyze survey data from police officers in England; they found that organizational justice was significantly correlated with positive attitudes towards serving the community. These researchers also found that this association between organizational justice and attitudes towards serving the public was mediated by commitment to many different aspects of community policing and specifically for community policing officers, by overall satisfaction with their law enforcement organization. Lee et al.'s (2013) study was aimed at understanding police corruption and how organizational

structure may play a role in this significant law enforcement organizational issue. Their study specifically examined the direct effect of supervisors' acceptance and tolerance of patrol officers' misconduct and the effect of a department-wide deviant subculture, on the degree of police corruption; these researchers found that these two variables discussed are highly influential when it comes to patrol officers' attitudes regarding police corruption. Much like Lee et al., Willits (2014) investigated another aspect of police organizational structure and culture and how this impacts an under-studied, yet substantial topic of concern: assaults on police officers. Willits explored the relationship between police organizational culture and assaults on police officers in the United States using data from 1999-2001. Willits found that organizational context and organizational complexity are important predictors of violence against law enforcement officers.

Synthesis

In summary, the literature reviewed, under the three foci explored, leads to the design, purpose and importance of this study. Under the first topic, measurement of police officer use of force, it was found that the general public has long been yearning for a more reliable way to measure and record use of force (Moore & Braga, 2004; Shane, 2008), that there is significant conceptual ambiguity when it comes to what police use of force actually means (Klahm et al., 2013) and in terms of how to measure use of force incidents, many researchers have argued that force must not be thought of as a static concept, but rather on a continuum (Terrill, 2005; Wolf et al., 2009). Within the second topic, predictive and explanatory factors were found to explain use of force from the individual incident level, the neighborhood level and the law enforcement organization level, including that incident-level characteristics (Chapman, 2012) and organizational characteristics (Willits & Nowacki, 2013) are significant elements that explain the

frequency of use of force occurrences. At the individual incident level, prior research has found that offender behavior, visibility of interaction (Friedrich, 1980), age of arrestee (Lee et al., 2010) and arrestee's resistance (Garner et al., 2002; Lee et al., 2010) are significant factors and at the organizational level, in-service training (Lee et al., 2010), higher education (Chapman, 2012) and the measure of force utilized in the specific case (Garner et al., 2002) are important factors in predicting the frequency of use of force incidents. Based on these findings, researchers have recommended action at policy and societal levels such as increased use of non-lethal weapons (Macdonald et al., 2009), for society to continue to question police use of force, for macro-social changes such as gun law control and the differentiation of the role of the police (Manning, 1980), that the government needs to take a more substantial role in controlling opportunity for force (Reiss, 1980) and that police organizations must do a better job of controlling use of force (Lindgren, 1981).

Lastly, under the third topic, organizational theory including structure and culture, it was found that the perseverance of police culture has been thought of as a substantial obstacle to police reform (Chan, 1996) and that American police organizations illustrate both organizational continuity and organizational change (Mastrofski & Willis, 2010; Myren, 1960). The literature to date, while addressing a range of factors that help to explain and understand police use of force, is short with respect to the ways in which use of force is measured and the predictive and explanatory factors involved in use of force incidents. This study fills a gap in the literature by addressing the question- using 2013 LEMAS use of force data, what are organizational as well as structural correlates of American police officer use of force incidents? Although this study is largely exploratory, the literature review points to testable hypotheses, which will be detailed in the methods section.

Methods

Research Design

This study uses secondary data, the 2013 wave of LEMAS, obtained from the Interuniversity Consortium for Political and Social Research (ICPSR). Conducted periodically since 1987, LEMAS is a nationally representative survey in which the Bureau of Justice Statistics collects data from over 3,000 state and local law enforcement agencies regarding a wide range of topics. LEMAS includes all law enforcement agencies that employ 100 or more sworn officers and smaller departments are sampled from strata based on the number of officers employed by that agency. LEMAS collects data on the following general topics, “agency responsibilities, operating expenditures, job functions of sworn and civilian employees, officer salaries and special pay, demographic characteristics of officers, weapons and armor policies, education and training requirements, computers and information systems, vehicles, special units, and community policing activities” along with adding a new section in 2013 on police use of force (Bureau of Justice Statistics Website, 2013).

Sample: 2013 LEMAS Data and Participants

The sample design for the 2013 LEMAS called for the survey to be sent to 3,336 state and local law enforcement agencies, including 2,353 local police departments, 933 sheriff’s departments and 50 primary state police agencies. Twenty-six local police departments were determined to be out-of-scope for the LEMAS survey due to the fact that they had either closed, were functioning on a part-time basis or had outsourced their operations; 38 sheriff’s offices were also excluded from the survey in 2013 because these agencies had no primary law enforcement jurisdiction. In total, the survey was sent to 3,272 law enforcement agencies, including 2,327 local police departments, 895 sheriff’s offices and 50 state agencies. Out of the

3,272 agencies that the survey was sent to, 2,822 departments responded, giving an overall response rate of 86% (Bureau of Justice Statistics Website, 2013).

The final database for the 2013 LEMAS includes 2,059 local police departments, 717 sheriff's offices and 46 state law enforcement agencies, with the following response rates by agency type: 88% for local law enforcement agencies, 80% for sheriff's offices and 92% for state law enforcement agencies (Bureau of Justice Statistics, 2013). The LEMAS sampling protocol selects all large agencies (those with 100 or more officers) and a random sample of smaller agencies with selection strata defined by the size and type of agency. The LEMAS data includes a final weighting variable, which is applied for analytic purposes in order to make the data nationally representative.

Variables

Dependent variables. In order to examine organizational and structural correlates of police use of force using 2013 LEMAS data, this study will utilize three dependent variables. The primary dependent variable for this analysis is the total use of force incidents the police agency recorded. This dependent variable's response is a continuous numerical value and it is a follow-up from a previous question asking if the agency records use of force incidents and how. It is crucial to note here that by using this as the primary dependent variable, this research is limiting its analysis to agencies that record use of force data at the incident-level. The primary dependent variable was transformed into a rate variable, calculated as the number of incidents divided by the number of full-time sworn personnel, multiplied by 100, and treated as such; due to this fact, this research is theorizing that the independent variables tested predict how frequently officers use force within an agency. The rate variable is named 'ForceIncidentsper100' and is the number of force incidents per 100 officers, within each agency

surveyed. A filter variable was then created to filter out extreme values to ensure that extreme outliers or data errors would not skew the results. The following steps were utilized, examined the distribution of reported force incidents, and identified potentially extreme values among agencies in the highest percentile range. For example, for dependent variable number one, 'ForceIncidentsper100', extreme values were the ten responses over 500 use of force incidents per 100 officers.

The secondary dependent variables for this analysis were the method by which the police agency recorded use of force, and the number of separate reports from individual officers or deputies recorded. The variable concerning the method by which the police agency recorded use of force had the following four response options, prior to re-coding: "use of force form," "use of force documented in arrest/offense report," "no formal records of use of force incidents maintained," and "other method of documentation." This variable was recoded into a binary indicator variable, where 1 indicates "use of force form" or "use of force documented in arrest/offense report," and 0 indicates "no formal records of use of force incidents maintained" or "other methods of documentation", the new variable is named 'HowAgencyRecords'. The secondary dependent variable relating how many separate reports from individual officers or deputies on use of force the agency recorded, is given as a continuous numerical value and was not recoded for this analysis.

Independent variables. The first independent variable is the size of the city, county or state in which the police agency serves. This independent variable is theoretically important due to the fact that as populations increase, the frequency of police-citizen interactions increase and as such, the frequency and probability of incidents involving police use of force may also increase, resulting in higher rates. This variable is given as a continuous numerical value, and

represents the Census Bureau population estimate from 2012. This variable was not recoded for this analysis.

The second and third independent variables in this study are the agency's minimum education requirements for sworn new hires, and the number of employees hired for full-time sworn positions that had at least a bachelor's degree. The agency's minimum education requirement was recoded into a binary indicator variable, where 1 indicates more than a high school diploma required for full-time sworn positions, and 0 indicates high school diploma or less required for full-time sworn positions; the new variable is named 'EducationRequirements'. The number of employees hired with at least a bachelor's degree is given as a continuous numerical value and was not recoded for this analysis. As discussed earlier, Chapman (2012) found that among patrol officers, higher education predicted less use of force overall, and across all duties, without controlling for age, younger officers used more force, however when controlling for age, more experienced officers used more force; these findings point to the potential importance of an agency's minimum education requirement and the number of employees hired for full-time sworn positions having at least a bachelor's degree, in understanding the rate of police officer use of force.

The fourth independent variable is the types of weapons or actions authorized for use by the agency's officers. This variable is theoretically important because research has shown that the number of weapons or actions authorized for use by agencies has the potential to impact overall use of force (Castillo et al., 2012; Taylor et al., 2010). This independent variable was transformed by reducing it into a count of the total number of authorized weapons or actions and this new variable is named 'WeaponsActionsAuthorized'. The fifth independent variable indicates whether the agency requires documentation when certain types of weapons or actions

are used. This independent variable should theoretically be correlated with how an agency reports use of force incidents and as such, should theoretically also be somewhat predictive of how useful the LEMAS force data may be for that particular agency. This independent variable was transformed by reducing it into a count of how many weapons or actions require documentation and this new variable is named 'DocumentationRequirements'.

The sixth independent variable is how the agency documents use of force incidents. Also explored previously, Garner et al. (2002) found that the relationship between encounter-level characteristics and police officer use of force are contingent on the amount of resistance employed by the suspect and the measure of force utilized in that case. Garner et al.'s conclusions suggested that how an agency documents officer use of force might also be a crucial variable to explain frequency of use of force. This variable was recoded into a binary indicator variable, where 1 indicates one report per officer involved in a use of force incident, and 0 indicates one report per incident, no records, or other method of record for use of force incidents; the new variable is named 'HowAgencyDocuments'.

The seventh, eighth and ninth independent variables in this study are related to whether the agency values and/or utilizes community policing. These variables could be important in explaining the overall nature and strength of the relationship between the police and the community in which they serve. If the police-citizen relationship is strong and is characterized by mutual respect and collaboration, it is hypothesized that there would be less overall force used by police officers. The seventh independent variable specifically looks at if there is a community-policing component in the agency's mission statement. This variable was recoded into a binary indicator variable, where 1 indicates the agency has a written mission statement and there is a community-policing component, and 0 indicates the agency does not have a written

mission statement or that the agency does have a written mission statement but there is no community-policing component; this new variable is named 'CommPolicingMissionStatement'. The eighth independent variable has to do with the agency having at least 8 hours of community-policing training for new recruits. This variable was recoded into a binary indicator variable, where 1 indicates all new recruits have at least 8 hours of community-policing training, and 0 indicates half or more, less than half, or none of the agency's recruits had at least 8 hours of community-policing training; this new variable is named 'CommPolicingRecruitTraining'. The ninth independent variable specifically addresses if the agency has at least 8 hours of community-policing training for its sworn personnel, while on the job. This variable was recoded into a binary indicator variable, where 1 indicates all sworn personnel have at least 8 hours of in-service community-policing training, and 0 indicates half or more, less than half, or none of the agency's sworn personnel have at least 8 hours of in-service community-policing training; this new variable is named 'CommPolicingIn-ServiceTraining'.

The tenth independent variable is the type of law enforcement agency the officer is employed by. This variable was recoded into a binary indicator variable, where 1 indicates local police department, and 0 indicates Sheriff's office or primary state law enforcement agency; this new variable is named 'AgencyType'. This independent variable could be important for this analysis because it has to do with how much interaction the police have with the community. If the police have more interaction with the community, the more likely they are to be involved with a use of force incident. When it comes to the type of law enforcement agency, local police departments have the broadest general purpose, with sheriffs' offices being next and state police departments having the least broad; their general purpose and scope of work could be related to use of force due to their level and quantity of citizen interaction. The eleventh independent

variable that was utilized in this study was the minimum salary for entry-level officers or deputies; this was a continuous numerical variable and was not recoded for this analysis. The minimum salary for an entry-level officer or deputy is theoretically important because this could contribute to an officer or deputy's motivation to perform their job; it is hypothesized that the more an officer is paid for their job, the less likely they will be to use force. It could be possible that the more an officer is paid for their job, the more that officer would want to keep their job and in turn, not jeopardize it by using force when not completely necessary. The twelfth and last independent variable analyzed in this study was the total operating budget of the law enforcement agency. This variable's response on the survey is given in continuous numerical form and it was not recoded for this analysis. The total operating budget for a law enforcement agency could be related to police officer use of force because it could be related to the amount of initial and/or on-going training an officer or deputy has available to them, in terms of de-escalation and other techniques other than use of force. Total operating budget could also be related to the amount of support the agency receives from the area they serve (i.e. tax dollars and financial support), which could in turn be connected to trust in the police, levels of violence against police and force used against citizens. It is also important to note here that is it most likely the case that population size, agency size and total operating budget are all correlated to one another.

Research Questions and Hypotheses

Below is a list of the major research questions and specific testable hypotheses that will be explored in this study.

Research Question 1: *What organizational elements of a law enforcement agency influence rates of use of force/number of use of force incidents? And how?*

H 1: Agencies with higher education requirements for full-time sworn personnel will have lower rates of use of force/number of use of force incidents.

H 2: Agencies with higher numbers of full-time sworn personnel with at least a Bachelor's degree will have lower rates of use of force/number of use of force incidents.

H 3: The more types of weapons and actions authorized for use by the agency's officers, the higher the rates of force/number of use of force incidents will be.

H 4: If the agency requires documentation for most or all weapons and actions authorized, then their use of force rates/number of use of force incidents will be lower.

H 5: If the agency requires one report per officer involved in a use of force incident, then their use of force rates/number of use of force incidents will be lower.

H 6: If the agency has a community-policing component in their mission statement, then their use of force rates/number of use of force incidents will be lower.

H 7: If the agency requires at least 8 hours of community-policing training for their new recruits, then their use of force rates/number of use of force incidents will be lower.

H 8: If the agency requires at least 8 hours of in-service community-policing training, then their use of force rates/number of use of force incidents will be lower.

H 9: Local police departments will have higher rates of force/number of use of force incidents than Sheriff's offices and primary state law enforcement agencies.

H 10: Law enforcement agencies with higher minimum salaries for entry-level police officers will have lower rates of use of force/number of use of force incidents.

H 11: Law enforcement agencies with higher operating budgets will have lower rates of use of force/number of use of force incidents.

Research Question 2: *What structural or outside elements of a law enforcement agency influence rates of use of force/number of use of force incidents? And how?*

H 12: Based on the 2012 Census Bureau population estimates, the larger the city the law enforcement agency serves, the higher the rates of use of force/number of use of force incidents.

Analytic Plan

This analysis will begin by exploring descriptive and bivariate statistics in order to lay the groundwork for multivariate models. The analysis will provide frequencies for each of the dependent and independent variables and it will include standard measures of central tendency including mean and median, as well as measures of dispersion such as the minimum and maximum responses and standard deviation. Next, the analysis will move into a series of bivariate tests; given the variety of independent variables, different forms of bivariate analyses will be reported. In order to fully examine the research question, what organizational and structural correlates predict police officer use of force, a regression technique will be used. Due to the fact that this study has three separate dependent variables, logistic regression as well as ordinary least squares (OLS) regression will be used. Logistic regression assumes the

relationship between the dependent variable and the independent variables is non-linear. Logistic regression is used when the dependent variable is binary or dichotomous and like OLS regression, logistic regression enables the researcher to estimate a coefficient that quantifies the effect of a given independent variable on the dependent variable of interest (Bachman & Paternoster, 2008, p. 615-616). OLS regression, on the other hand is used when the dependent variable is continuous in nature. The analytic results are presented in the next section.

Results

Descriptive Statistics

For both the dependent and independent variables utilized in this study and explained in depth previously, descriptive statistics were run and analyzed including: valid number of responses, mean, median, standard deviation, minimum response and maximum response. These statistics assist in understanding how these variables are distributed, and inform analytic decisions such as any transformations that may be necessary.

Dependent variables. The first dependent variable, 'ForceIncidentsper100', represents the rate of use of force incidents per 100 officers. This variable had 1,463 valid responses, with the minimum value being 0 and the maximum value being 500. The mean for 'ForceIncidentsper100' was 59.92, while the median was 38.16 and the standard deviation was 70.58 (see Table 1). Together, these statistics indicate some positive skew.

The second dependent variable utilized in this study, 'HowAgencyRecords', represents how the agency documents use of force incidents. This variable had 2,708 valid responses, and it was recoded to be binary. Of the 2,708 valid responses, 2,624 responses (96.9%) indicated that the law enforcement agency uses a use of force form or that the use of force is documented in the arrest/offense report, whereas 84 responses (3.1%) indicated that the agency had no formal records or utilized other methods of use of force documentation (see Table 1). The mean for this variable was 0.97, the median was 1 and the standard deviation was 0.17.

The third and final dependent variable, 'SAFE_SEPR', represents how many separate reports from individual officers or deputies on use of force the agency recorded. This variable had 1,104 valid responses, with the minimum value being 0 and the maximum value being 3,860.

The mean for 'SAFE_SEPR' was 97.59, the median was 15 and the standard deviation was 284.27 (see Table 1). Together, these statistics indicate some positive skew.

Table 1. Descriptive Statistics – Dependent Variables

Type of Variable	Variable Name	Valid Number of Responses	Mean	Median	Standard Deviation	Minimum Response	Maximum Response
Dependent Variable	ForceIncidentsper100	1463	59.92	38.16	70.58	0.00	500.00
Dependent Variable	HowAgencyRecords	2708	0.97	1.00	0.17	0.00	1.00
Dependent Variable	SAFE_SEPR	1104	97.59	15.00	284.27	0.00	3860

Given the positive skew indicated in the descriptive statistics for the two continuous dependent variables, a visual examination of the distributions was undertaken in order to assess the situation. Figures 1 and 2 below are the histograms for the continuous dependent variables ('ForceIncidentsper100' and 'SAFE_SEPR') utilized in this study.

Figure 1. Histogram of 'ForceIncidentsper100'

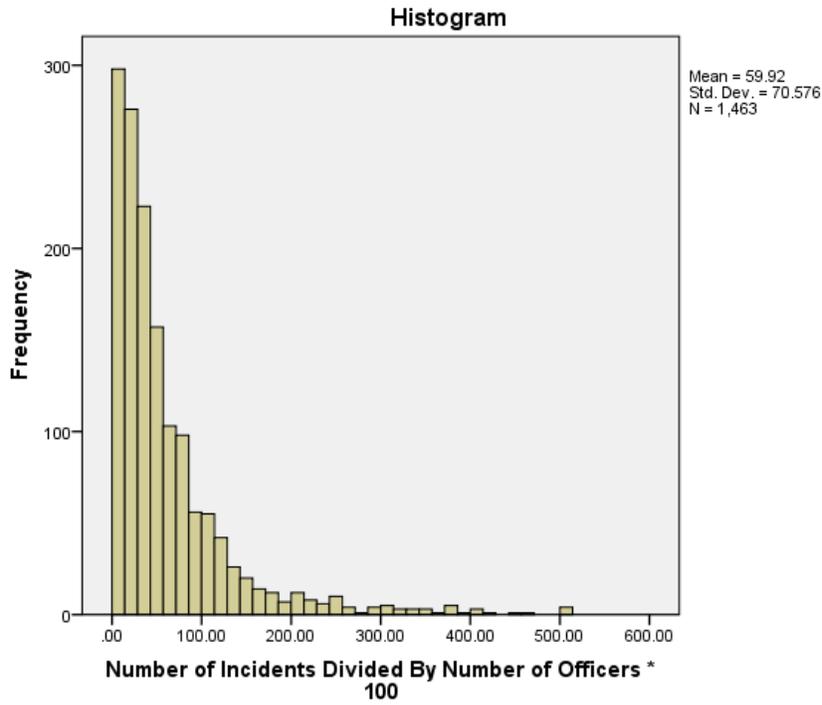
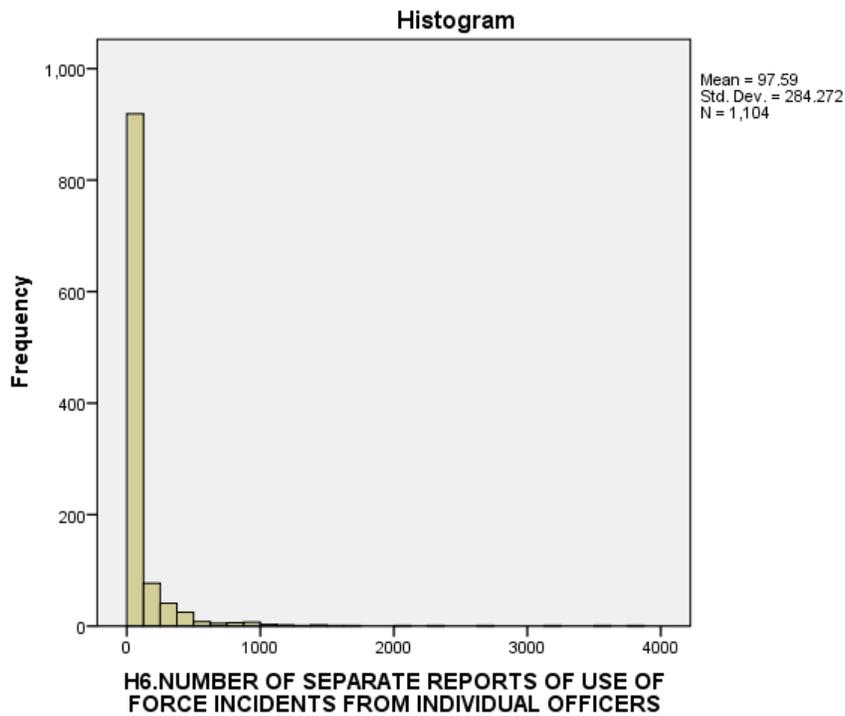


Figure 2. Histogram for 'SAFE_SEPR'



Based upon a review of the descriptive statistics and the histograms for 'ForceIncidentsper100' and 'SAFE_SEPR', it will be necessary to log-transform these variables in order to control the skew and more closely satisfy the assumptions of the OLS regression model.

Independent variables. The first independent variable utilized in this study, 'POP2012', represents the 2012 Census Bureau population estimate for the city, county or state the law enforcement agency serves. This variable had 2,807 valid responses, with a minimum value of 196 and a maximum value of 37,955,293. The mean for 'POP2012' was 21,271, the median was 25,088 and the standard deviation was 1,281,897 suggesting positive skew (see Table 2).

The second independent variable in this study, 'EducationRequirements', represents the education requirements for a given agency. This variable had 2,807 valid responses and was recoded to be binary. Of the 2,807 responses, 2,394 responses (85.3%) indicated that the agency required a high school diploma or less and 413 responses (14.7%) indicated that the agency required more than a high school diploma. The mean for this variable was 0.15, the median was 0 and the standard deviation was 0.35 (see Table 2).

The third independent variable utilized in this study, 'HIR_BD_VAR', represents the number of full-time sworn hires with a bachelor's degree or higher. This variable had 2,498 valid responses, with a minimum value of 0 and a maximum value of 865. The mean for 'HIR_BD_VAR' was 4.56, the median was 1 and the standard deviation was 25.57 suggesting positive skew (see Table 2).

The fourth independent variable in this study, 'WeaponsActionsAuthorized', represents a count of the total number of weapons or actions that are authorized for use by the agency's officers. This variable had 2,807 valid responses, with a minimum value of 0 and a maximum

value of 14. The mean response for this variable was 9.57, the median was 10 and the standard deviation was 3.02 (see Table 2).

The fifth independent variable utilized in this study, 'DocumentationRequirements', represents a count of the total number of weapons or actions that require documentation when used. This variable had 2,807 valid responses with a minimum value of 0 and a maximum value of 14. The mean for this variable was 9.41, the median was 10 and the standard deviation was 3.08 (see Table 2).

The sixth independent variable in this study, 'HowAgencyDocuments', represents how the law enforcement agency documents use of force incidents. This variable had 2,807 valid responses and was recoded to be binary. Of the 2,807 responses, 1,249 responses (44.5%) indicated that the agency required one report per incident, had no records or used other methods of documentation and 1,558 responses (55.5%) indicated that the agency required one report per officer involved in the incident. The mean for this variable was 0.56, the median was 1 and the standard deviation was 0.50 (see Table 2).

The seventh independent variable utilized in this study, 'CommPolicingMissionStatement', represents if the law enforcement agency has a community-policing component in its mission statement. This variable had 2,737 valid responses and was recoded to be binary. Of the 2,737 responses, 740 responses (27%) indicated that the agency had no written mission statement or that there was no community-policing component, whereas 1,997 responses (73%) indicated that the agency did have a community policing component in their mission statement. The mean response for this variable was 0.73, the median was 1 and the standard deviation was 0.44 (see Table 2).

The eighth independent variable in this study, 'CommPolicingRecruitTraining', represents if the agency requires at least 8 hours of community policing training to new recruits. This variable had 2,234 valid responses and was recoded to be binary. Of the 2,234 responses, 1,088 responses (48.7%) indicated that the agency did not require all recruits to have at least 8 hours of community policing training, whereas 1,146 responses (51.3%) indicated that the agency did require all recruits to have this training. The mean response for this variable was 0.51, the median was 1 and the standard deviation was 0.50 (see Table 2).

The ninth independent variable utilized in this study, 'CommPolicingIn-ServiceTraining', represents if the agency requires at least 8 hours of in-service community policing training. This variable had 2,567 valid responses was recoded to be binary; of the 2,567 valid responses, 1,701 responses (66.3%) indicated that the agency did not require all officers or deputies to have at least 8 hours of in-service community policing training, and 866 responses (33.7%) indicated that the agency did require all officers or deputies to have this training. The mean response for this variable was 0.34, the median was 0 and the standard deviation was 0.47 (see Table 2).

The tenth independent variable utilized in this study, 'AgencyType', represents what type of law enforcement agency the respondent was. This variable had 2,807 valid responses and was recoded to be binary. Of the 2,807 valid responses, 761 responses (27.1%) indicated the agency was a Sherriff's office or a primary state law enforcement agency, whereas 2,046 responses (72.9%) indicated that the agency was a local police department. The mean response for this variable was 0.73, the median was 1 and the standard deviation was 0.44 (see Table 2).

The eleventh independent variable in this study, 'PAY_SAL_OFCCR_MIN', represents the minimum salary for new officers or deputies. This variable had 2,605 valid responses, with a

minimum value of \$15,600 and a maximum value of \$119,891. The mean for ‘PAY_SAL_OFCCR_MIN’ was \$40,738, the median was \$39,019 and the standard deviation was \$11,873 (see Table 2).

The twelfth and final independent variable utilized in this study, ‘BDGT_TTL’, represents the total operating budget for the law enforcement agency. This variable had 2,605 valid responses, with a minimum value of \$30,000 and a maximum value of \$4,612,690,000. The mean response for “BDGT_TTL’ was \$27,417,107, the median was \$4,872,597 and the standard deviation was \$132,329,442. These statistics indicate positive skew.

Table 2. Descriptive Statistics – Independent Variables

Type of Variable	Control or Key IV	Variable Name	Valid Number of Responses	Mean	Median	Standard Deviation	Minimum Response	Maximum Response
Independent Variable	Control	POP2012	2807	21271.18	25088.00	1281897.11	196.00	37955293.00
Independent Variable	Key	EducationRequirements	2807	0.15	0.00	0.35	0.00	1.00
Independent Variable	Key	HIR_BD_VAR	2498	4.56	1.00	25.57	0.00	865.00
Independent Variable	Key	WeaponsAuthorizedDocumentationRequirements	2807	9.57	10.00	3.02	0.00	14.00
Independent Variable	Key	HowAgencyDocuments	2807	0.56	1.00	0.50	0.00	1.00
Independent Variable	Key	CommPolicingMissionStatement	2737	0.73	1.00	0.44	0.00	1.00
Independent Variable	Key	CommPolicingRecruitTraining	2234	0.51	1.00	0.50	0.00	1.00

Independent Variable	Key	CommPolicingIn-ServiceTraining	2567	0.34	0.00	0.47	0.00	1.00
Independent Variable	Control	AgencyType	2807	0.73	1.00	0.44	0.00	1.00
Independent Variable	Control	PAY_SAL_OFOCR_MIN	2605	40738.42	39019.00	11873.19	15600.00	119891.00
Independent Variable	Control	BDGT_TTL	2605	27417107.40	4872597.00	13232944.252	30000.00	461269000.00

Figures 3 through 8 below are histograms for the continuous independent variables ('POP2012', 'HIR_BD_VAR', 'WeaponsActionsAuthorized', 'DocumentationRequirements', 'PAY_SAL_OFOCR_MIN' and 'BDGT_TTL') utilized in this study.

Figure 3. Histogram for POP2012

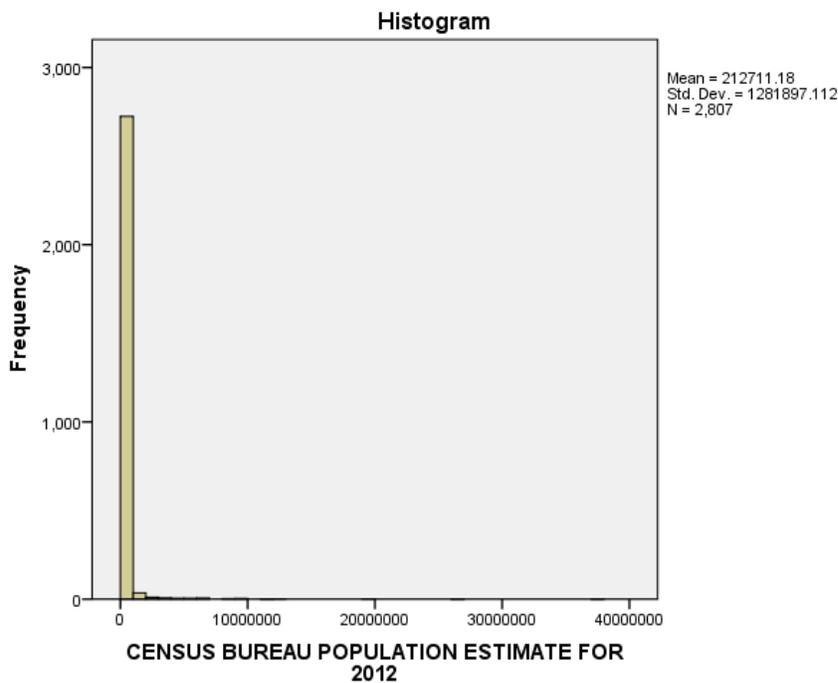


Figure 4. Histogram for HIR_BD_VAR

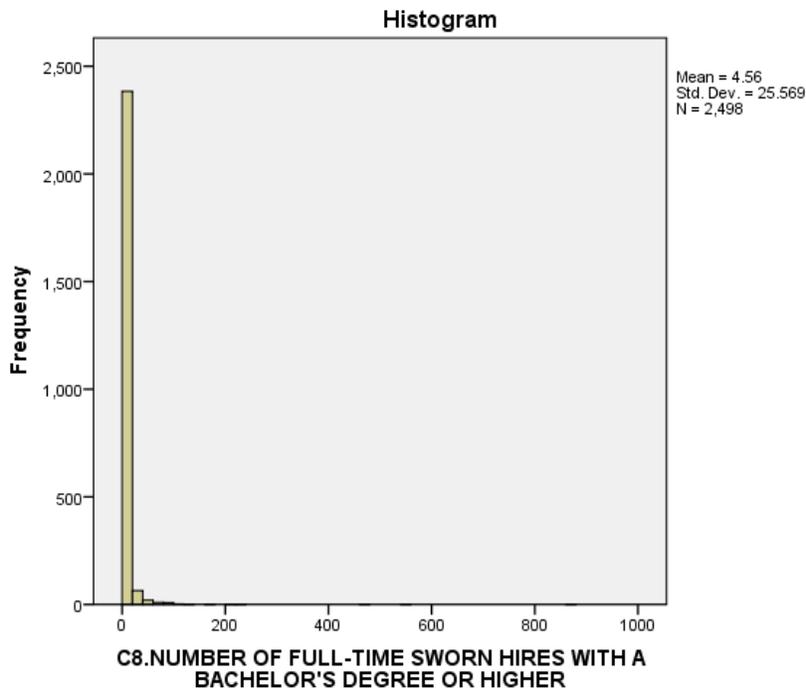


Figure 5. Histogram for WeaponsActionsAuthorized

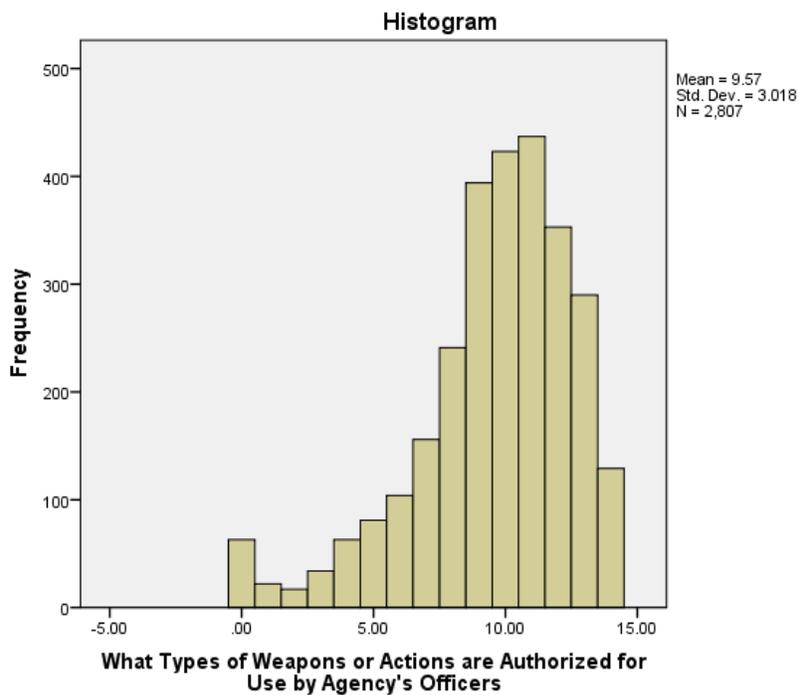


Figure 6. Histogram for DocumentationRequirements

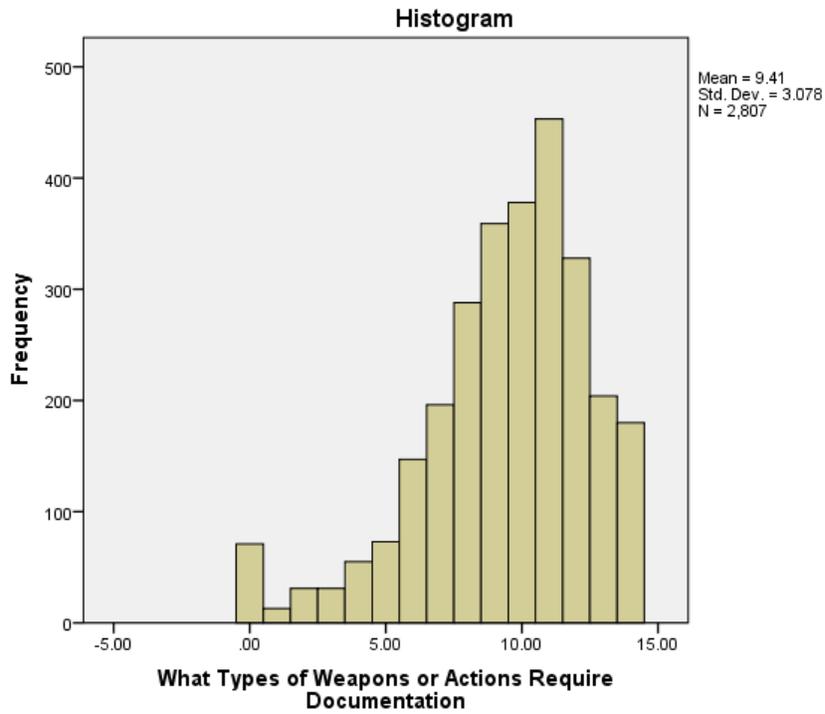


Figure 7. Histogram for PAY_SAL_OFCCR_MIN

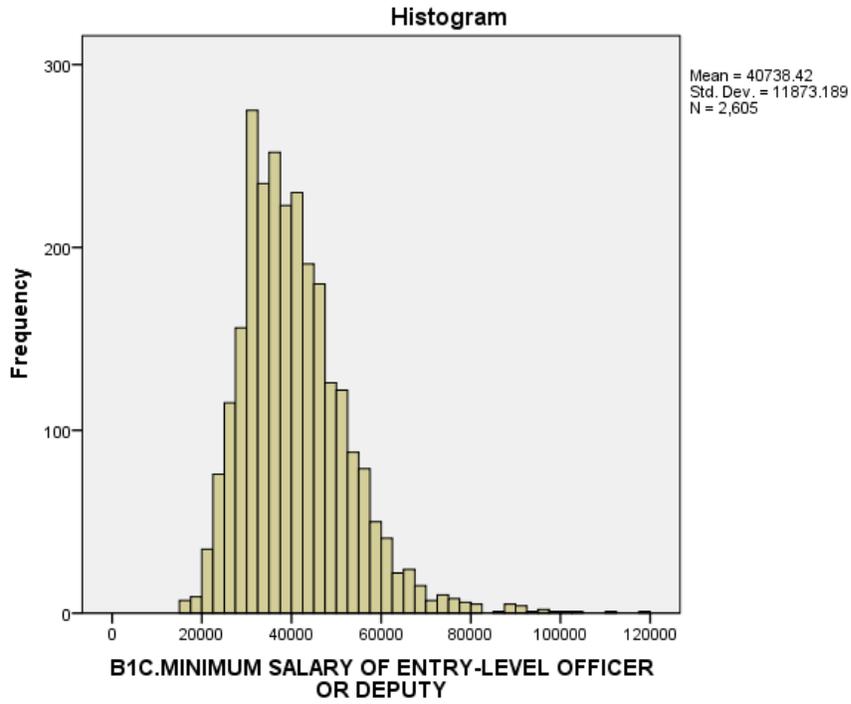
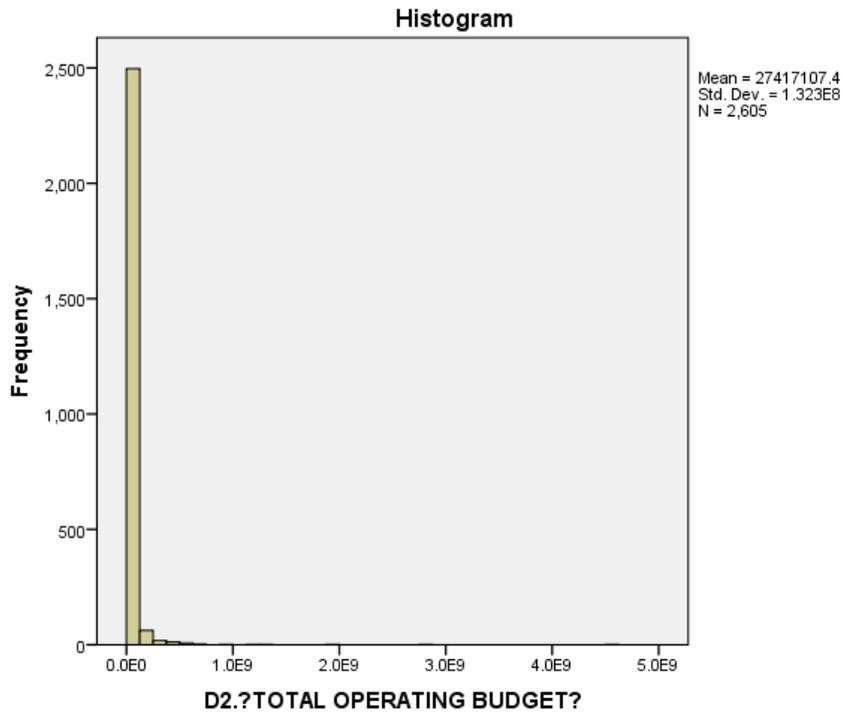


Figure 8. Histogram for BDGT_TTL



Based upon a review of the descriptive statistics and histograms for ‘POP2012’, ‘HIR_BD_VAR’, and ‘BDGT_TTL’, it will be necessary to log-transform these variables in order to control skew and more closely satisfy the assumptions of the OLS regression model.

Bivariate Relationships

Provided in this section are the results from the bivariate analysis of the dependent variables and the key independent variables utilized in this study; control variables’ bivariate results are not included in this section. Multiple bivariate methods were used to determine the strength and significance of the relationships between the dependent and key independent variables in this study, including independent sample t-tests, bivariate correlations and chi-square tests for independence.

Independent sample t-tests. An independent sample t-test is a bivariate method that tests for the difference in the means of two independent groups, in order to ultimately determine whether there is a statistically significant difference in the population means. The null hypothesis for an independent sample t-test is that the two means are statistically the same. An independent sample t-test is most appropriate when the independent variable of interest is categorical (i.e. two or more groups) and the dependent variable of interest is continuous, although it may also be utilized in the other direction (i.e. by re-specifying which variable is independent/dependent) in order to understand the nature of the bivariate relationship (Bachman & Paternoster, 2008).

Provided here are the results from three independent sample t-tests completed. The first is a t-test of dependent variable number two (‘HowAgencyRecords’) with independent variable number three (‘HIR_BD_VAR’), the second is a t-test of dependent variable number two with independent variable number four (‘WeaponsActionsAuthorized’) and the third is a t-test of dependent variable number two with independent variable number five

(‘DocumentationRequirements’). These three pairs of dependent variables and independent variables satisfy the requirements for an independent sample t-test given the nature of the variables (i.e. the dependent variable is binary and the independent variable is continuous).

Although there is an observed difference in the average number of full-time sworn hires having a BA or higher degree (2.45 in agencies not documenting use of force, compared with 4.67 in agencies that do), the difference is not statistically significant ($t(2426)=0.729, p=0.466$). It can be concluded that there is no statistically significant difference between agencies that use a use of force form or record their use of force on an arrest/offense report and agencies that have no formal records or use other methods of documentation, when it comes to number of full-time sworn hires with at least a bachelor’s degree.

There is an observed difference in the average number of weapons or actions authorized for use by an agency’s officers (8.75 in agencies not documenting use of force, compared with 9.74 in agencies that do), and the difference is statistically significant ($t(86.376)=2.549, p=0.013$). It can be concluded that there is a statistically significant difference between agencies that use a use of force form or record their use of force on an arrest/offense report and agencies that have no formal records or use other methods of documentation, when it comes to what types of weapons or actions are authorized for use by the agency’s officers or deputies.

There is an observed difference in the average number of weapons or actions that require documentation (7.18 in agencies not documenting use of force, compared with 9.67 in agencies that do), and the difference is statistically significant ($t(85.298)=5.439, p<0.001$). It can be concluded that there is a statistically significant difference between agencies that use a use of force form or record their use of force on an arrest/offense report and agencies that have no

formal records or use other methods of documentation, when it comes to what types of weapons and/or actions require documentation when used by an agency's officers or deputies.

Bivariate correlations. Bivariate correlations quantify the direction and strength of the relationship between two continuous variables (Bachman & Paternoster, 2008). The correlation coefficient, also known as Pearson's r , reveals the strength of the relationship between the two variables, with a value ranging from negative one to positive one; a negative one represents a perfect negative relationship and a positive one represents a perfect positive relationship (Bachman & Paternoster, 2008). Provided here are correlations for two dependent variables and three independent variables. The first correlation of interest is between dependent variable number one ('ForceIncidentsper100') and independent variable number three ('HIR_BD_VAR'), the second is a correlation between dependent variable number one and independent variable number four ('WeaponsActionsAuthorized'), the third is a correlation between dependent variable number one and independent variable number five ('DocumentationRequirements'), the fourth is a correlation between dependent variable number three ('SAFE_SEPR') and independent variable number three, the fifth is a correlation between dependent variable number three and independent variable number four and the sixth correlation provided here is between dependent variable number three and independent variable number five (see Table 3). These six pairs of dependent variables and independent variables satisfy the requirements of bivariate correlations given the nature of the variables (i.e. both variables are continuous in nature). Interpretations of the results for each of these bivariate correlations are provided following the output.

Table 3. Correlation Matrix

Correlations

		Number of Incidents Divided By Number of Officers * 100	C8.NUMBER OF FULL-TIME SWORN HIRES WITH A BACHELOR'S DEGREE OR HIGHER	What Types of Weapons or Actions are Authorized for Use by Agency's Officers	What Types of Weapons or Actions Require Documentation	H6.NUMBER OF SEPARATE REPORTS OF USE OF FORCE INCIDENTS FROM INDIVIDUAL OFFICERS
Number of Incidents Divided By Number of Officers * 100	Pearson Correlation Sig. (2-tailed)	1	<i>-0.027</i>	<i>.165**</i>	<i>.184**</i>	<i>.101*</i>
	N	1463	.325 1333	.000 1463	.000 1463	.021 518
C8.NUMBER OF FULL-TIME SWORN HIRES WITH A BACHELOR'S DEGREE OR HIGHER	Pearson Correlation Sig. (2-tailed)	<i>-0.027</i>	1	<i>.043*</i>	<i>.026</i>	<i>.159**</i>
	N	.325 1333	.032 2498	.197 2498	.000 2498	.000 1015
What Types of Weapons or Actions are Authorized for Use by Agency's Officers	Pearson Correlation Sig. (2-tailed)	<i>.165**</i>	<i>.043*</i>	1	<i>.502**</i>	<i>.134**</i>
	N	.000 1463	.032 2498	.000 2807	.000 2807	.000 1104
What Types of Weapons or Actions Require Documentation	Pearson Correlation Sig. (2-tailed)	<i>.184**</i>	<i>.026</i>	<i>.502**</i>	1	<i>.121**</i>
	N	.000 1463	.197 2498	.000 2807	.000 2807	.000 1104
H6.NUMBER OF SEPARATE REPORTS OF USE OF FORCE INCIDENTS FROM INDIVIDUAL OFFICERS	Pearson Correlation Sig. (2-tailed)	<i>.101*</i>	<i>.159**</i>	<i>.134**</i>	<i>.121**</i>	1
	N	.021 518	.000 1015	.000 1104	.000 1104	.000 1104

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

There is no significant correlation between the rate of use of force per 100 officers and the number of full time sworn hires with a bachelor's degree or higher ($r(1331) = -0.027$, $p = 0.325$). There is a weak but significant positive relationship between the rate of use of force per 100 officers and the scale number of what types of weapons and actions that are authorized for use by the agency's officers or deputies ($r(1461) = 0.165$, $p < 0.001$).

There is a weak but significant positive relationship between the rate of use of force per 100 officers and the scale number of what types of weapons and/or actions require documentation when used by an agency's officers or deputies ($r(1461) = 0.184$, $p < 0.001$). There is a weak but significant positive relationship between the number of separate reports of use of

force incidents from individual officers or deputies and the number of full-time sworn hires with at least a bachelor's degree ($r(1013)=0.159, p<0.001$).

There is a weak but significant positive relationship between the number of separate reports of use of force incidents from individual officers or deputies and the scale number of what types of weapons and actions that are authorized for use by the agency's officers or deputies ($r(1102)=0.134, p<0.001$). There is a weak but significant positive relationship between the number of separate reports of use of force incidents from individual officers or deputies and the scale number of what types of weapons and/or actions require documentation when used by an agency's officers or deputies ($r(1102)=0.121, p<0.001$).

Chi-square test for independence. Chi-square tests for independence examine two categorical variables from a single population, in order to ultimately determine whether there is a statistically significant association between the two variables. The null hypothesis with a chi-square test is that the two variables are independent. While the chi-square test indicates whether the variables may be related to one another, it does not provide any information about the strength of the relationship. One measure of association is the phi coefficient; the phi coefficient tests the strength of the association, and is appropriate for nominal-by-nominal testing. The phi coefficient can range from 0 to 1, with 0 being no relationship and 1 being that there is a perfect relationship between the dependent variable and the independent variable being tested (Bachman & Paternoster, 2008). Provided here are the results from four chi-square tests completed. The first is a chi-square test between dependent variable number two ('HowAgencyRecords') and independent variable number two ('EducationRequirements'), the second is a chi-square test between dependent variable number two and independent variable number seven ('CommPolicingMissionStatement'), the third is a chi-square test between dependent variable

number two and independent variable number eight ('CommPolicingRecruitTraining') and the fourth chi-square test provided here is between dependent variable number two and independent variable number nine ('CommPolicingIn-ServiceTraining') (see Tables 4- 7). These four pairs of dependent variables and independent variables satisfy the requirements of a chi-square test for independence given the nature of the variables (i.e. both variables are categorical and nominal in nature). Interpretations of the results for each of these chi-square tests are provided following the crosstab outputs.

Table 4. Crosstab- DV Number two and IV Number two

			Education Requirements for New Sworn Officers		Total
			High School Diploma or Less Required	More than High School Diploma Required	
How Agency Records Use of Force	No Formal Records or Other Methods of Documentation	Count % within Education Requirements for New Sworn Officers	71 3.1%	13 3.2%	84 3.1%
	Use of Force Form or Use of Force Documented in Arrest/Offense Report	Count % within Education Requirements for New Sworn Officers	2232 96.9%	392 96.8%	2624 96.9%
Total		Count % within Education Requirements for New Sworn Officers	2303 100.0%	405 100.0%	2708 100.0%

A chi-square test for independence was performed to examine the relationship between how a law enforcement agency records use of force and the education requirements for new sworn hires. The relationship between these two variables was not significant, $\chi^2(1, N=2708)=0.018, p=0.892$.

Table 5. Crosstab- DV Number two and IV Number seven

		Community Policing Component in Mission Statement		Total
		No Written Statement or No Community Policing Component in Statement	Community Policing Component in Written Statement	

How Agency Records Use of Force	No Formal Records or Other Methods of Documentation	Count % within Community Policing Component in Mission Statement	38 5.3%	42 2.2%	80 3.0%
	Use of Force Form or Use of Force Documented in Arrest/Offense Report	Count % within Community Policing Component in Mission Statement	684 94.7%	1899 97.8%	2583 97.0%
Total		Count % within Community Policing Component in Mission Statement	722 100.0%	1941 100.0%	2663 100.0%

A chi-square test for independence was performed to examine the relationship between how a law enforcement agency records use of force and if the agency has a community policing component in their mission statement. The relationship between these two variables is statistically significant, $\chi^2(1, N=2663)=17.348, p<0.001$. The phi coefficient value found was 0.081 and the strength of the association is fairly weak between these two variables.

Table 6. Crosstab- DV Number two and IV Number eight

			At Least 8 Hours of Community Policing Training for Recruits		Total
			Not All Recruits (Half or more, less than half or none)	All New Recruits	
How Agency Records Use of Force	No Formal Records or Other Methods of Documentation	Count % within At Least 8 Hours of Community Policing Training for Recruits	39 3.7%	24 2.2%	63 2.9%
	Use of Force Form or Use of Force Documented in Arrest/Offense Report	Count % within At Least 8 Hours of Community Policing Training for Recruits	1020 96.3%	1091 97.8%	2111 97.1%
Total		Count % within At Least 8 Hours of Community Policing Training for Recruits	1059 100.0%	1115 100.0%	2174 100.0%

A chi-square test for independence was performed to examine the relationship between how a law enforcement agency records use of force and if the agency requires at least 8 hours of community policing training for new recruits. The relationship between these two variables is

statistically significant, $\chi^2(1, N=2174)=4.520, p=0.034$. The phi coefficient value found was 0.046 and the strength of the association is fairly weak between these two variables.

Table 7. Crosstab- DV Number two and IV Number nine

			At Least 8 Hours of In-Service Community Policing Training		Total
			Not All Recruits (Half or more, less than half or none)	All New Recruits	
How Agency Records Use of Force	No Formal Records or Other Methods of Documentation	Count % within At Least 8 Hours of In-Service Community Policing Training	48 2.9%	25 3.0%	73 2.9%
	Use of Force Form or Use of Force Documented in Arrest/Offense Report	Count % within At Least 8 Hours of In-Service Community Policing Training	1613 97.1%	813 97.0%	2426 97.1%
Total		Count % within At Least 8 Hours of In-Service Community Policing Training	1661 100.0%	838 100.0%	2499 100.0%

A chi-square test for independence was performed to examine the relationship between how a law enforcement agency records use of force and if the agency requires at least 8 hours of in-service community policing training. The relationship between these two variables was not significant, $\chi^2(1, N=2499)=0.017, p=0.896$.

Multivariate Models

Due to the fact that this study has dependent variables measured in both continuous and binary form, ordinary least squares (hereinafter OLS) regression as well as logistic regression was used. However, upon initial analysis of the logistic model, it was discovered that because of case attrition, there was only a handful of cases in the 0 category, with almost all agencies in the 1 group; with such a highly skewed distribution, it is unlikely that any model could reliably discriminate cases into one or the other group. Due to this fact, regression analysis of the second dependent variable was not conducted.

OLS regressions were run for dependent variable number one and dependent variable number three, to determine the relationships between them and independent variables numbers one through eleven. Independent/control variable number twelve ('BDGT_TTL') was left out of this analysis due to the fact that the tolerance statistics between it and another one of the more primary independent variables was very low. The tolerance statistics being low means that this variable was not truly independent, which in turn violates the independence assumption of the OLS regression model. Tables 8 and 9 below present the OLS regression outputs for dependent variable number one ('ForceIncidentsper100') and dependent variable number three ('SAFE_SEPR'). Interpretations of the results for each of these regressions are provided following the outputs.

Table 8. OLS Regression Output- DV number one 'ForceIncidentsper100'

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.337 ^a	.114	.097	.92289

a. Predictors: (Constant), B1C.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY, Ln_HIR_BD_VAR, At Least 8 Hours of In-Service Community Policing Training, How Agency Documents Use of Force, What Types of Weapons or Actions Require Documentation, Education Requirements for New Sworn Officers, Community Policing Component in Mission Statement, Type of Law Enforcement Agency, At Least 8 Hours of Community Policing Training for Recruits, What Types of Weapons or Actions are Authorized for Use by Agency's Officers, Ln_POP2012

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.065	11	5.733	6.731	.000 ^b
	Residual	492.297	578	.852		
	Total	555.363	589			

a. Dependent Variable: Ln_ForceIncidentsper100

b. Predictors: (Constant), B1C.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY, Ln_HIR_BD_VAR, At Least 8 Hours of In-Service Community Policing Training, How Agency Documents Use of Force, What Types of Weapons or Actions Require Documentation, Education Requirements for New Sworn Officers, Community Policing Component in Mission Statement, Type of Law Enforcement Agency, At Least 8 Hours of Community Policing Training for Recruits, What Types of Weapons or Actions are Authorized for Use by Agency's Officers, Ln_POP2012

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.999	.424		7.067	.000		
	Ln_POP2012	-.036	.038	-.057	-.942	.347	.412	2.424

Education Requirements for New Sworn Officers	-.222	.103	-.087	-2.155	.032	.937	1.068
Ln_HIR_BD_VAR	-.014	.040	-.017	-.346	.730	.643	1.554
What Types of Weapons or Actions are Authorized for Use by Agency's Officers	.050	.022	.127	2.296	.022	.504	1.984
What Types of Weapons or Actions Require Documentation	.071	.019	.174	3.796	.000	.733	1.364
How Agency Documents Use of Force	.152	.079	.075	1.907	.057	.981	1.020
Community Policing Component in Mission Statement	.096	.114	.035	.844	.399	.912	1.096
At Least 8 Hours of Community Policing Training for Recruits	-.121	.087	-.060	-1.394	.164	.828	1.208
At Least 8 Hours of In-Service Community Policing Training	.116	.087	.056	1.333	.183	.880	1.137
Type of Law Enforcement Agency	.203	.144	.085	1.408	.160	.419	2.387
BIC.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY	-6.688E-6	.000	-.078	-1.792	.074	.816	1.225

a. Dependent Variable: Ln_ForceIncidentsper100

The results of the regression indicated that independent variables one through eleven explained 11.4% of the variance in the rate of use of force per 100 officers ($r^2 = 11.4$, $F(11, 578) = 6.73$, $p < 0.000$). The p value is statistically significant, which indicates that at least one of the coefficients in this model is statistically significant. The constant unstandardized B coefficient of 2.999 means that this would be the value of rate of use of force, when all of the independent variables utilized in this analysis are equal to zero. For this OLS regression, the independent variable with the largest standardized beta coefficient was independent variable number five, which was a variable representing a scale count of what types of weapons or actions require documentation by the law enforcement agency. The standardized beta coefficient was 0.174 and this means that this independent variable had the strongest positive effect on the rate of use of force, when compared to the other independent variables.

In the subsequent analysis, only the variables that are significant predictors of number of use of force incidents will be explored in depth. It was found that independent variable number one, 2012 Census Bureau population estimate, did not significantly predict rate of use of force ($\beta = -0.036$, $p=0.347$). Independent variable number two, education requirements for new sworn officers, was found to significantly predict rate of use of force ($\beta = -0.222$, $p=0.032$). What the unstandardized B coefficient means is that when the response goes from 0 to 1 or when the agency requires at least a high school diploma for full-time sworn new hires, there is a 0.222 unit decrease in rate of use of force, holding all other independent variables constant.

It was found that independent variable number three, number of officers with at least a bachelors degree, did not significantly predict rate of use of force ($\beta = -0.014$, $p=0.730$). Independent variable number four, what types of weapons or actions are authorized for use by agency's officers, was found to significantly predict rate of use of force ($\beta = 0.050$, $p=0.022$). What the unstandardized B coefficient means is that for each additional type of weapons or action authorized for use by agency's officers, there is a 0.050 unit increase in the rate of use of force, holding all other independent variables constant.

It was found that independent variable number five, what types of weapons or actions require documentation, significantly predicted rate of use of force ($\beta = 0.071$, $p=0.000$). What the unstandardized B coefficient means is that for each additional type of weapon or action that requires documentation, there is a 0.071 unit increase in the rate of use of force, holding all other independent variables constant. Independent variable number six, how agency document use of force, was found to not significantly predict rate of use of force ($\beta = 0.152$, $p=0.057$). Due to the fact that how agency documents use of force was very close to the threshold for significance, it could be argued that, this variable should be analyzed in depth as well. What the unstandardized

B coefficient means is that when the response goes from 0 to 1, or when the agency requires one report per officer involved in a use of force incident, there is a 0.152 unit increase in the rate of use of force, holding all other independent variables constant.

It was found that dependent variable number seven, community policing component in mission statement, was not a significant predictor of rate of use of force ($\beta = 0.096$, $p = 0.399$). Independent variable number eight, at least eight hours of community policing training for recruits, was found to not significantly predict rate of use of force ($\beta = -0.121$, $p = 0.164$). It was found that independent variable number nine, at least eight hours of in-service community policing training, was not a significant predictor of rate of use of force ($\beta = 0.116$, $p = 0.183$). Independent variable number ten, type of law enforcement agency, was found to not significantly predict rate of use of force ($\beta = 0.203$, $p = 0.160$). It was found that independent variable number eleven, minimum salary for entry-level officer or deputy, was not a significant predictor of rate of use of force ($\beta = -6.688E-6$, $p = 0.074$).

Table 9. OLS Regression Output- DV number three 'SAFE_SEPR'

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726 ^a	.527	.516	1.09877

a. Predictors: (Constant), B1C.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY, At Least 8 Hours of Community Policing Training for Recruits, What Types of Weapons or Actions Require Documentation, Ln_HIR_BD_VAR, Community Policing Component in Mission Statement, Type of Law Enforcement Agency, At Least 8 Hours of In-Service Community Policing Training, Education Requirements for New Sworn Officers, What Types of Weapons or Actions are Authorized for Use by Agency's Officers, Ln_POP2012

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	540.167	10	54.017	44.742	.000 ^b
	Residual	484.124	401	1.207		
	Total	1024.291	411			

a. Dependent Variable: Ln_SAFE_SEPR

b. Predictors: (Constant), B1C.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY, At Least 8 Hours of Community Policing Training for Recruits, What Types of Weapons or Actions Require Documentation, Ln_HIR_BD_VAR, Community Policing Component in Mission Statement, Type of Law Enforcement Agency, At Least 8 Hours of In-Service Community Policing Training, Education Requirements for New Sworn Officers, What Types of Weapons or Actions are Authorized for Use by Agency's Officers, Ln_POP2012

		Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-7.000	.596		-11.742	.000		
	Ln_POP2012	.794	.053	.753	15.061	.000	.471	2.122
	Education Requirements for New Sworn Officers	-.159	.143	-.041	-1.115	.265	.893	1.120
	Ln_HIR_BD_VAR	-.005	.057	-.004	-.094	.925	.697	1.434
	What Types of Weapons or Actions are Authorized for Use by Agency's Officers	.060	.029	.094	2.069	.039	.570	1.755
	What Types of Weapons or Actions Require Documentation	.081	.026	.121	3.075	.002	.765	1.308
	Community Policing Component in Mission Statement	.095	.173	.019	.548	.584	.931	1.074
	At Least 8 Hours of Community Policing Training for Recruits	.054	.121	.017	.449	.654	.834	1.198
	At Least 8 Hours of In-Service Community Policing Training	.018	.123	.005	.145	.885	.888	1.126
	Type of Law Enforcement Agency	1.081	.198	.275	5.456	.000	.464	2.157
	BIC.MINIMUM SALARY OF ENTRY-LEVEL OFFICER OR DEPUTY	-2.796E-6	.000	-.020	-.517	.605	.775	1.290

a. Dependent Variable: Ln_SAFE_SEPR

The results of the regression indicated that independent variables one through eleven explained 52.7% of the variance in how many separate reports from individual officers or deputies on use of force the agency recorded ($r^2 = 52.7$, $F(10, 401) = 44.742$, $p < 0.000$). The p value is statistically significant, which indicates that at least one of the coefficients in this model is statistically significant. The constant unstandardized B coefficient of -7.000 means that this would be the value of number of separate use of force reports, when all of the independent variables utilized in this analysis are equal to zero. For this OLS regression, the independent variable with the largest standardized beta coefficient was independent variable number one, which was a variable representing the Census Bureau population estimate for 2012. The standardized beta coefficient was 0.753 and this means that this independent variable had the

strongest positive effect on the number of separate use of force reports, when compared to the other independent variables.

In the subsequent analysis, only the variables that are significant predictors of the number of use of force reports will be explored in depth. It was found that independent variable number one, 2012 Census Bureau population estimate, was a significant predictor of the number of use of force incidents ($\beta = 0.794$, $p = 0.000$). What the unstandardized B coefficient means is that a 1% increase in population produces a 0.794% increase in the number of use of force reports, holding all other independent variables constant. Independent variable number two, education requirements for new sworn officers, was found to not significantly predict the number of use of force reports ($\beta = -0.159$, $p = 0.265$).

It was found that independent variable number three, number of officers with at least a bachelors degree, did not significantly predict the number of use of force reports ($\beta = -0.005$, $p = 0.925$). Independent variable number four, what types of weapons or actions are authorized for use by agency's officers, was found to significantly predict number of use of force reports ($\beta = 0.060$, $p = 0.039$). What the unstandardized B coefficient means is that for each additional type of weapons or action authorized for use by agency's officers there is a 0.060 unit increase in the log of number of use of force reports, holding all other independent variables constant.

It was found that independent variable number five, what types of weapons or actions require documentation, significantly predicted the number of use of force reports ($\beta = 0.081$, $p = 0.002$). What the unstandardized B coefficient means is that for each additional types of weapon or action that requires documentation, there is a 0.081 unit increase in the log of number of use of force reports, holding all other independent variables constant.

It was found that dependent variable number seven, community policing component in mission statement, was not a significant predictor of the number of use of force reports ($\beta = 0.095$, $p = 0.584$). Independent variable number eight, at least eight hours of community policing training for recruits, was found to not significantly predict the number of use of force reports ($\beta = 0.054$, $p = 0.654$). It was found that independent variable number nine, at least eight hours of in-service community policing training, was not a significant predictor of the number of use of force reports ($\beta = 0.018$, $p = 0.885$).

Independent variable number ten, type of law enforcement agency, was found to significantly predict the number of use of force reports ($\beta = 1.081$, $p = 0.000$). What the unstandardized B coefficient means is that when the response goes from 0 to 1 or when the law enforcement agency is a local police department, there is a 1.081 unit increase in the log of number of use of force reports, holding all other independent variables constant. It was found that independent variable number eleven, minimum salary for entry-level officer or deputy, was not a significant predictor of the number of use of force reports ($\beta = -2.796E-6$, $p = 0.605$).

Limitations

There were a number of limitations of this study including the use of secondary data and historical difficulty in collecting use of force data from law enforcement agencies. First, this study utilized secondary data analysis collected through the LEMAS survey and thus data collection, available variables, and data was limited to what was collected through the original methodology and instrument. Second, the data itself was limited in that what was collected provided a limited amount of information about use of force incidents and about the law

enforcement agencies in general. Third, issues with respect to measurement validity and reliability are important to consider in the sense that some agencies may not have been truthful when reporting their officer/deputy use of force data, some departments may not have even had accurate records, and given that there is no national standard for how law enforcement agencies record use of force incidents, there are likely significant inconsistencies across the country regarding how and when agencies document use of force.

Finally, the sample itself could potentially be biased based on which agencies and departments actually responded to the LEMAS survey. It could be speculated that responding agencies have more resources, more staffing and/or specialized staffing with access to all the information required to respond to the LEMAS survey and/or that these agencies or departments have leadership willing to make responding to surveys a priority, and therefore are supportive of the time being dedicated to this task. If agencies and departments do not have resources to aid in the reporting of use of force data, then critical data is missing in the LEMAS data that will be missed in research and discourse about national police use of force. Thus as a result of this potentially missing data resulting from agency underreporting, the results reported in this study may be incomplete and/or not representative of all law enforcement agencies across the country.

Discussion & Conclusion

As stated previously, research on police use of force has become increasingly more prevalent and more important in response to high-profile use of force incidents across the United States have. Researchers from a range of academic disciplines, including criminal justice, sociology, psychology, political science and public administration, have examined law enforcement use of force and attempted to determine the causes, predictors and frequency. The primary purpose of this study was to expand the current academic understanding of correlates of police use of force decisions and incidents, as well as develop a better understanding of use of force data such as LEMAS, as well as to offer any policy implications for training and/or management of law enforcement agencies. The primary research question this study aimed to answer was, what organizational and structural elements of a law enforcement agency influence rates of use of force and overall number of incidents of police officer use of force.

This study first began with a review of existing literature on police officer use of force, including the topics of measurement, predictive factors and other attempts to explain it, as well as a review of literature on organizational theory and organizational culture. It second provided the methods that were used to uncover the correlates of police officer use of force incidents. Next, it provided the results of the extensive statistical analysis completed in this study and lastly, this master's thesis study will conclude with overall conclusions, hypotheses revisited, opportunities/suggestions for future research and policy implications.

Hypotheses Revisited

Provided here are the hypotheses stated previously and an examination of the evidence to support the hypotheses from this analysis.

H 1: Agencies with higher education requirements for full-time sworn personnel will have lower rates of use of force/number of use of force incidents.

This independent variable was demonstrated to be a statistically significant predictor of dependent variable number one, 'ForceIncidenterper100', rate of use of force; given the -0.222 unstandardized B coefficient value, this hypothesis was supported. It was found that agencies with higher education requirements for full-time sworn personnel do in fact have lower rates of use of force.

H 2: Agencies with higher numbers of full-time sworn personnel with at least a Bachelor's degree will have lower rates of use of force/number of use of force incidents.

This hypothesis was not supported, as this independent variable was not a statistically significant predictor of either dependent variable. Agencies with higher numbers of full-time sworn personnel with at least a bachelor's degree were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 3: The more types of weapons and actions authorized for use by the agency's officers, the higher the rates of force/number of use of force incidents will be.

This independent variable was demonstrated to be a statistically significant predictor of dependent variable number one, 'ForceIncidenterper100', rate of use of force and dependent variable number three, SAFE_SEPR, number of use of force incidents; given the 0.050 unstandardized B coefficient value for dependent variable number one and 0.060 for dependent variable number three, this hypothesis was supported. It was found that the more types of

weapons and actions authorized for use by the agency's officers, the higher the rates of force and the higher the number of use of force incidents.

H 4: If the agency requires documentation for most or all weapons and actions authorized, then their use of force rates/number of use of force incidents will be lower.

This hypothesis was not supported. This independent variable was found to be a statistically significant predictor of both dependent variables, however given the 0.071 unstandardized B coefficient value for dependent variable number one and 0.081 for dependent variable number three, this hypothesis was not supported. Agencies that require documentation for most or all weapons and actions authorized were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 5: If the agency requires one report per officer involved in a use of force incident, then their use of force rates/number of use of force incidents will be lower.

This hypothesis was not supported, this independent variable was shown to be very close to the threshold of a statistically significant predictor of dependent variable number one, 'ForceIncidenterper100', rate of use of force, however given the 0.152 unstandardized B coefficient value, this hypothesis was not supported. Agencies that require one report per officer involved in a use of force incident were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 6: If the agency has a community-policing component in their mission statement, then their use of force rates/number of use of force incidents will be lower.

This hypothesis was not supported, as this independent variable was not a statistically significant predictor of either dependent variable. Agencies with a community-policing component in their mission statement were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 7: If the agency requires at least 8 hours of community-policing training for their new recruits, then their use of force rates/number of use of force incidents will be lower.

This hypothesis was not supported, as this independent variable was not a statistically significant predictor of either dependent variable. Agencies that require at least 8 hours of community-policing training for their new recruits were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 8: If the agency requires at least 8 hours of in-service community-policing training, then their use of force rates/number of use of force incidents will be lower.

This hypothesis was not supported, as this independent variable was not a statistically significant predictor of either dependent variable. Agencies that require at least 8 hours of in-service community-policing training were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 9: Local police departments will have higher rates of force/number of use of force incidents than Sheriff's offices and primary state law enforcement agencies.

This independent variable was demonstrated to be a statistically significant predictor of dependent variable number three, SAFE_SEPR, number of use of force incidents; given the 1.081 unstandardized B coefficient value for dependent variable number three, this hypothesis

was supported. It was found that local police departments have higher overall numbers of use of force incidents as compared to Sheriff's offices and primary state law enforcement agencies.

H 10: Law enforcement agencies with higher minimum salaries for entry-level police officers will have lower rates of use of force/number of use of force incidents.

This hypothesis was not supported, as this independent variable was not a statistically significant predictor of either dependent variable. Law enforcement agencies with higher minimum salaries for entry-level police officers were not found to have lower rates of use of force or lower numbers of use of force incidents.

H 12: Based on the 2012 Census Bureau population estimates, the larger the city the law enforcement agency serves, the higher the rates of use of force/number of use of force incidents.

This independent variable was demonstrated to be a statistically significant predictor of dependent variable number three, SAFE_SEPR, number of use of force incidents; given the 0.794 unstandardized B coefficient value for dependent variable number three, this hypothesis was proven. It was found that based on 2012 Census Bureau population estimates that the larger the city the law enforcement agency serves, the higher the overall numbers of use of force incidents.

Policy Implications

As discussed in the limitation section of this study, there is no national standard or requirement to record use of force or record it in a certain way, and due to this fact, all use of force data has limitations. In order to have a better understanding of what predicts use of force and to perhaps prevent or decrease these incidents, a nationally recognized and accepted standard

for use of force records would be extremely beneficial, and this is one of the most significant policy implications for this study. Another policy implication for law enforcement agencies specifically involves education requirements; as discussed, education requirements were proven to be a statistically significant variable for dependent variable number one, 'ForceIncidentsper100', rate of use of force per one hundred officers, which points to a policy implication for law enforcement agencies to require education of new officers/deputies. Through this analysis, it was found that agencies/departments with higher education requirements for new full-time sworn personnel have lower rates of use of force. This finding supports existing research conducted on Chapman (2012), where this researcher found that higher education predicted less use of force overall. The findings for the current study point to a policy implication that perhaps if more law enforcement agencies across the country required more education for their new officers/deputies, there would be less overall use of force incidents.

One interesting finding from this study is that, although it was found that departments with higher education requirements have overall lower rates of use of force, it was not found that agencies with higher numbers of full-time sworn personnel with at least a bachelor's degree had lower rates of use of force or lower numbers of use of force incidents. Perhaps a way to explain or account for this discrepancy could be in the way the education requirements variable was recorded in this study, which points to a need for future research in this area. An additional noteworthy implication that came from this study is related to hypotheses that were not supported by this analysis, specifically connected to community policing. Within this study, three community policing related variables were examined and hypothesized to be predictors of use of force; agencies having a community policing component in their mission statement, agencies requiring at least eight hours of community policing training for new recruits and

agencies requiring at least eight hours of in-service community policing training. All three variables were found to not be significant predictors, which points to the fact that this particular policing strategy is not connected with use of force as previously argued and hypothesized. A few ways to potentially account for the lack of correlation between community policing and use of force in this study could be the way these community policing variables were coded and/or the level to which these variables accurately measured the extent to which the agency valued or utilized community policing principles. Although community policing was not found in existing literature to be connected to use of force, the fact that these three independent variables were not found to be significant could serve as a policy implication for agencies/departments who are looking to reduce use of force numbers, specifically to know that this policing strategy would not be connected to use of force. These findings also point to a need for future research on this hypothesized connection between community policing and police office use of force.

Future Research Suggestions & Concluding Comments

The most significant suggestion for future research based upon this study is that much more data (and better data) is needed in order to ultimately determine what factors predict police officer use of force. Given the fact that the 2013 LEMAS data includes the new section on police use of force, and given the fact that the results from the 2013 wave of LEMAS were released in August 2015, more analysis of this data is needed. Future research should further examine this data and determine additional correlates to use of force. There is a considerable need for more research looking into predictive factors of police use of force, as the more this body of research grows, the more likely common correlates will be identified, and the more meaningful and empirically based the recommendations will be for law enforcement agencies to adjust their training, practices and policies.

In conclusion, this study found a variety of factors to be significant predictors of police officer use of force including, education requirements for new sworn officers or deputies, number of weapons or actions that were authorized for use by the agency's officers, type of law enforcement agency and size of the city, county or state the agency served. This research is important in 2017, due to the social and political climate that continues to put pressure on law enforcement in general, but specifically related to their levels of use of force. This study contributes to existing literature on this topic by examining a newly published source of American police organization's use of force statistics and by discovering a few statistically significant predictors of rates of use of force and overall numbers of use of force incidents. The study described in this report provided policy implications for law enforcement agencies, as well as future research suggestions on this growing body of work.

References

- Bureau of Justice Statistics, Data Collection: Law Enforcement Management and Administrative Statistics (2013) [Website]. Retrieved from <http://www.bjs.gov/index.cfm?ty=dcdetail&iid=248>
- Alpert, G., & Dunham, R. (1997). *The force factor: Measuring police use of force relative to suspect resistance*. Washington DC: Police Executive Research Forum.
- Alpert, G. A. & Smith, W. C. (1994). How reasonable is the reasonable man?: Police and excessive force. *The Journal of Criminal Law and Criminology*, 85(2), 481-501.
- Apuzzo, M & Cohen. S. (2015, August 11). Data on force by police across U.S. proves almost useless. *The New York Times*. Retrieved from http://www.nytimes.com/2015/08/12/us/data-on-use-of-force-by-police-across-us-proves-almost-useless.html?_r=1
- Atherley, L. A. & Hickman, M. J. (2014). Controlling use of force: Identifying police use of excessive force through analysis of administrative records. *Policing: A Journal of Policy and Practice*, 8(2), 123-134.
- Arthur, J. A. (1993). Interpersonal violence, criminal victimization and attitudes towards police use of force. *International Review of Modern Sociology*, 23(1), 91-106.
- Bachman, R. & Paternoster, R. (2008). *Statistical methods for criminology and criminal justice*. New York: NY: McGraw Hill Higher Education.
- Blau, P. M. (1970). A formal theory of differentiation in organizations. *American Sociological Review*, 35(2), 201-218.
- Bolger, P. C. (2015). Just following orders: A meta-analysis of the correlates to American police officer use of force decisions. *American Journal of Criminal Justice*, 40, 466-492.

- Castillo, E. M., Prabhaker, N. & Luu, B. (2012). Factors associated with law enforcement-related use-of-force injury. *American Journal of Emergency Medicine*, 30, 526-531.
- Chan, J. (1996). Changing police culture. *The British Journal of Criminology*, 36(1), 109-134.
- Chapman, C. (2012). Use of force in minority communities is related to police education, age, experiences, and ethnicity. *Police Practice and Research*, 13(5), 421-436.
- Friedrich, R. J. (1980). Police use of force: Individuals, situations and organizations. *Annals of the American Academy of Political and Social Science*, 452, 82-97.
- Garland, D. (2001). *The culture of control: Crime and social order in contemporary society*. University of Chicago Press.
- Garner, J. H., Maxwell, C. D. & Heraux, C. G. (2002). Characteristics associated with the prevalence and severity of force used by the police. *Justice Quarterly*, 19(4), 705- 746.
- Hassell, K. D., Zhao, J. S. & Maguire, E. R. (2003). Structural arrangements in large municipal police organizations. *Policing: An International Journal of Police Strategies and Management*, 25(2), 231-250.
- Hickman, M. J. & Piquero, A. R. (2009). Organizational, administrative and environmental correlates of complaints about police use of force. *Crime & Delinquency*, 55(1), 3-27.
- Hickman, M. J., Piquero, A. R. & Garner, J. H. (2008). Toward a national estimate of police use of nonlethal force. *Criminology & Public Policy*, 7(4), 563- 604.
- Hofstede, G., Neuijen, B., Ohayv, D. D. & Sanders, G. (1990). Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, 35(2), 286-316.
- Jacobs, D. & Britt, D. (1979). Inequality and police use of deadly force: An empirical assessment of a conflict hypothesis. *Social Problems*, 26(4), 403-412.

- Kahane, L. H. (2008). *Regression basics*. Thousand Oaks, CA: Sage Publications, Inc.
- Klahm IV, C. F., Frank, J. & Liederbach, J. (2013). Understanding police use of force: Rethinking the link between conceptualization and measurement. *Policing: An International Journal of Policing Strategies and Management*, 37(3), 558-578.
- Law Enforcement Management and Administrative Statistics (LEMAS), 2013.
- Lee, H., Jang, H., Yun, I., Lim, H. & Tushaus, D. W. (2010). An examination of police use of force utilizing police training and neighborhood contextual factors. *Policing: An International Journal of Police Strategies & Management*, 33(4), 681-702.
- Lee, H., Lim, H., Moore, D. D. & Kim, J. (2013). How police organizational structure correlates with frontline officers' attitudes towards corruptions: A multilevel model. *Police Practice and Research*, 14(5), 386-401.
- Lindgren, J. (1981). Organizational and other constraints on controlling the use of deadly force by police. *Annals of the American Academy of Political and Social Sciences*, 455, 110-119.
- MacDonald, J. M., Kaminski, R. J. & Smith, M. R. (2009). The effect of less-lethal weapons on injuries in police use-of-force events. *American Journal of Public Health*, 99(12) 2268-2274.
- Manning, P. K. (1980). Violence and the police role. *Annals of American Academy of Political and Social Science*, 452, 135-144.
- Mastrofski, S. D. & Willis, J. J. (2010). Police organization continuity and change: Into the twenty-first century. *Crime and Justice*, 39(1), 55-144.
- Moore, M. H. & Braga, A. A. (2004). Police performance measurement: A normative framework. *Criminal Justice Ethics*, 23(1), 3- 19.
- Myhill, A. & Bradford, B. (2012). Overcoming cop culture? Organizational justice and police

- officers' attitudes towards the public. *Policing: An International Journal of Policing Strategies and Management*, 36(2), 338-356.
- Myren, R. A. (1960). A crisis in police management. *The Journal of Criminal Law, Criminology and Police Science*, 50(6), 600-604.
- Payton, B. (1981). Police use of deadly force in Oakland. *The Black Scholar*, 12(1), 62-64.
- Phillips, T. & Smith, P. (2000). Police violence occasioning citizen complaint: An empirical analysis of time-space dynamics. *The British Journal of Criminology*, 40(3), 480-496.
- Rappert, B. (2002). Constructions of legitimate force: The case of CS sprays. *The British Journal of Criminology*, 42(4), 689-708.
- Reiss, A. J., Jr. (1980). Controlling police use of deadly force. *Annals of the American Academy of Political and Social Science*, 452, 122-134.
- Rushin, S. (2015). Structural reform litigation in American police departments. *Minnesota Law Review*, 1343- 1422.
- Schatmeier, E. H. (2013). Reforming police use of force practices: A case study of the Cincinnati police department. *Columbia Journal of Law and Social Problems*, 46(4), 539-586.
- Shafritz, J., Ott, S. & Jang, Y. S. (2016). *Classics of Organizational Theory*. Boston, MA: Cengage Learning.
- Shane, J. M. (2008). Developing a police performance measurement system. *FBI Law Enforcement Bulletin*, 77(9), 8-18.
- Taylor, B., Alpert, G., Kubu, B, Woods, D. & Dunham, R. G. (2010). Changes in officer use of force over time: A descriptive analysis of a national survey. *Policing: An International Journal of Policing Strategies and Management*, 34(2), 211-232.
- Terrill, W. (2005). Police use of force: A transactional approach. *Justice Quarterly*, 22(1), 107-

138.

United States Department of Justice. Office of Justice Programs. Bureau of Justice Statistics.

Law Enforcement Management and Administrative Statistics (LEMAS), 2013.

ICPSR36164-v2. Ann Arbor, MI: Inter-university Consortium for Political and Social

Research [distributor], 2015-09-22. <http://doi.org/10.3886/ICPSR36164.v2>

Waegel, W. B. (1984). How police justify the use of deadly force. *Social Problems*, 32(2), 144-155.

Willits, D. W. (2014). The organizational structure of police departments and assaults on police officers. *International Journal of Police Science and Management*, 16(2), 140-154.

Willits, D. W. & Nowacki, J. S. (2014). Police organization and deadly force: An examination of variation across large and small cities. *Policing & Society*, 24(1), 63-80.

Wilson, J. M. (2003). Measurement and association in the structure of municipal police organizations. *Policing: An International Journal of Strategies and Management*, 26(2), 276-297.

Wilson, J. Q. (1968). *Variety of Police Behavior: The Management of Law and Order in Eight Communities*. Cambridge, MA: Harvard University Press.

Wolf, R., Mesloh, C., Henych, M. & Thompson, L. F. (2009). Police use of force and cumulative force factor. *Policing: An International Journal of Policing Strategies and Management*, 32(4), 739-757.