

A National Study of Sustained Use of Force Complaints in Law Enforcement Agencies

Cori Pryor*
John H. Boman, IV
Thomas J. Mowen
Bowling Green State University

Michael McCamman
University of Arizona

* Corresponding author: Cori Pryor, Department of Sociology, 223 Williams Hall, Bowling Green State University, Bowling Green, OH 43403. Phone: (419) 372-2294. Fax: (419) 372-8306. Email: corpry@bgsu.edu.

Funding information

This research was supported in part by the Center for Family and Demographic Research, Bowling Green State University, which has core funding from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (P2CHD050959).

Declarations of interest: none

A National Study of Sustained Use of Force Complaints in Law Enforcement Agencies

Abstract

Purpose: This article examines how community and departmental characteristics relate to the number of sustained use of force complaints in a law enforcement agency.

Methods: Using national-level data from Law Enforcement Management and Administrative Statistics 2007, Uniform Crime Reports 2007, American Community Survey 2009 and bivariate and multivariate techniques, we investigate whether sustained uses of force vary across 1) community and regional characteristics in the U.S. and across departmental 2) policies, 3) training tendencies, and 4) hiring practices.

Results: Controlling for region, crime rate, and area median income, results demonstrate that sustained complaints increase when departments serve large, nonwhite populations. Regarding departmental policies, results are alarming: Departments with independent civilian complaint review boards, agencies which engage in community policing, and departments that implement personality tests when hiring sustain significantly higher numbers of use of force complaints. However, departments that screen for volunteer and community service histories in officer candidates have over one third fewer sustained complaints than departments that do not use this hiring screen.

Conclusions: In order to significantly reduce the amount of sustained complaints against a department, results suggest that agencies should assess community service and volunteer histories for potential officer candidates.

Keywords: citizen complaints; sustained complaints; use of force; police-community relations; community policing; procedural justice

A National Study of Sustained Use of Force Complaints in Law Enforcement Agencies

Introduction

The past few years have seen a great deal of strain placed on police-community relationships (U.S. Department of Justice, Community Relations Service, n.d.; President's Task Force on 21st Century Policing, 2015). Coinciding with events like those in Ferguson, Baltimore, and New York, there has been an increased focus on community policing which continues to garner much attention from members of the public, police, and researchers alike. As a result of this attention, a new spotlight – largely driven by individual citizens, activist groups, and social media campaigns (see Campaign Zero, n.d.; McGregor, 2016; OpenOversight, n.d.; Rhodes, 2016) – has been cast on the effectiveness through which police departments navigate their relationships with the community. While there are many markers of police-community relations, police use of force is consistently at the forefront of conversations regarding police-community relationships.

Research on police use of force has made considerable strides within the past few decades. It is generally understood that use of force is infrequent (Hickman, 2006) and is most commonly employed when officers attempt an arrest (United States Department of Justice, Office of Justice Programs, 1999). At the same time, important agency and community characteristics relate to patterns of use of force. Towards the former, research has shown that larger agencies (Terrill & Ingram, 2016), agencies with less experienced officers (Harris, 2009), and those located in higher crime areas report significantly greater uses of force than their counterparts (Alpert & MacDonald, 2001). Regarding community characteristics, research has noted that poorer neighborhoods and those with greater proportions of racial/ethnic minorities

experience greater use of force rates than middle-class and predominately white communities (Ajilore & Shirey, 2017; Smith & Holmes, 2014; Terrill & Reisig, 2003). Although research has highlighted how some agency and community characteristics relate to police use of force (e.g. Kramer & Remster, 2018; Lersch, Bazley, Mieczkowski & Childs, 2008; White, 2001) and complaints received from these uses of force (e.g. Hickman, Piquero & Greene, 2000; Holmes, 2000; Worrall, 2002), a much smaller body of research has focused on understanding how these factors relate to *sustained complaints* about police use of force.

Although understanding the correlates of police use of force is of the utmost concern to researchers, practitioners, and policymakers alike, we argue that the key focus of this discussion should not simply be about what factors of the police agency and/or community predict use of force. Instead, a highly complementary – but nonetheless separate, key question – is ‘how do characteristics of both a law enforcement agency and the community the agency serves relate to the number of *sustained, substantiated complaints* against the department’s officers?’ We define a ‘sustained complaint’ as a formal complaint issued by a citizen in response to a use of force where there is “sufficient evidence to justify disciplinary action” against the officer or officers involved (U.S. Department of Justice, Bureau of Justice Statistics, 2007). Despite only ten percent of use of force complaints being sustained (Hickman, 2006), sustained complaints against police use of force capture a theoretically and empirically distinct component of police-community relations that is not captured by overall trends in the broader context of use of force.

Intertwined in this issue is the realization that sustained use of force complaints are currently one of the most – if not the most – scrutinized factor of police department performance by the public and the media in the United States. Using a national-level, hybrid dataset that combines data from the 2009 American Community Survey (ACS), the Uniform Crime

Reporting (UCR) Program 2007, and the 2007 Law Enforcement Management and Administrative Statistics (LEMAS) dataset, this study investigates how community and departmental characteristics collectively relate to the number of sustained use of force complaints against a department in the past year. Using a series of bivariate and multivariate techniques, we investigate whether sustained uses of force vary across 1) regional characteristics in the U.S. and across departmental 2) training tendencies, 3) policies, and 4) hiring practices. Prior to discussing specific hypotheses, we first review research on sustained uses of force in respect to the four elements which we focus on – regional differences, departmental training practices, departmental policies, and departmental hiring practices.

Literature Review

Racial, Ethnic, Gender, and Age Differences in Complaints

In the criminological literature, there is a strong foundational knowledge on sustained uses of force. While much of this research focuses on individual-level factors, it is nonetheless beneficial when formulating hypotheses for what could be expected in the context of community-level factors. Extant research on use of force complaints generally concludes that while use of force complaints are rarely sustained (Hickman, 2006; Liederbach, Boyd, Taylor, & Kawucha, 2007), racial, ethnic, and gender differences play a key role in understanding who submits complaints and whether or not those complaints are sustained. Focusing both on gender and race, several studies demonstrate that male and nonwhite citizens are more likely to submit use of force complaints (Ajilore & Shirey, 2017; Holmes, 2000; Lersch, 1998; Terrill & Ingram, 2016). This repeated finding is also echoed in one of the earliest studies on citizen complaints. Fifty years ago, Hudson (1970) found that nonwhite citizens accounted for 70% of the

complaints against officers received by departments. Nearly four decades later and studying a similar issue, Liederbach and colleagues (2007) found that nonwhite citizens account for 77.5% of all complaints filed.

In a similar manner, research suggests that the age of complainants seems to have remained relatively constant over the years. In 1970, Hudson reported that 70% of complainants were between 16 and 45 years of age. In a similar finding many years later, Liederbach and colleagues (2007) find that 66.5% of complainants were between the ages of 20 and 39. As such, there is some continuity over time in the races of people filing complaints as well as the age of complainants.

Of the complaints that are lodged, those coming from black complainants are significantly less likely to be sustained than those of other races and ethnicities (Terrill & Ingram, 2016). Complaints against male officers (Brandl, Stroshine, & Frank, 2001; Terrill & Ingram, 2016) and complaints initiated by citizens rather than police (Griswold, 1994; Liederbach et al., 2007) are also less likely to be sustained. Looking at these findings from a different lens, research suggests that complaints against black officers, female officers, and departmental-initiated complaints (initiated by other officers or internal affairs investigators) are more likely to be sustained. However, the most nuanced of these findings pertains to gender. Although female officers are more likely to have complaints sustained against them (Brandl et al., 2001), women are less likely to receive complaints in the first place (Lersch & Mieczkowski, 2000).

Training Hours

With studies indicating that larger agencies (Terrill & Ingram, 2016) and agencies with less experienced officers (Harris, 2009) are the most likely to receive high numbers of use of force complaints, a significant amount of attention has also been placed on the role of officer training in uses of force. Most police training is a combination of pre-service training and in-service training, which varies by department and by state (e.g., see Morrison, 2006; Yan, 2016). Although in-service training happens throughout the officer's career, it is unlikely to ever reach the depth and immersion of the pre-service training that officers undergo at the start of their career (Morrison, 2006). Academy training focuses on developing basic skills and knowledge about weapons, tactics, encounters with citizens, and law (Langworthy, Hughes, & Sanders, 1995). Pre-employment field training often serves as an extension to academy training, where recruits work with veteran officers to learn how and when to apply the skills learned in their academy training to real encounters (Morrison, 2006).

Findings from the LEMAS 2007 data highlight the extensive training that officers receive at the beginning of their careers. On average, individual officers receive almost 700 academy training hours and 450 field training hours. The average number of in-service training hours, however, drops considerably (the average is 37). Despite the large amount of training, studies show that satisfaction with recruit training is mixed (Morin, Parker, Stepler, & Mercer, 2017), with some claiming that recruit training does not adequately prepare recruits (Morrison, 2006).

Under the *City of Canton, Ohio v. Harris* (1989) decision, the Supreme Court established that law enforcement agencies may be held liable for failure to train their officers. Despite this ruling having serious implications for police departments, empirical research on officer training hours as related to use of force is surprisingly sparse and intermingled with seemingly

counterintuitive results. For instance, Smith (2004) and Bailey (1996) found that higher amounts of field training hours related to more police killings of citizens. Equally problematic, Lee, Jang, Yun, Lim, and Tushaus (2010) found that there was a positive association between in-service training hours and police uses of force. At the same time, however, others have found no effect between training and uses of force (Morrison, 2006; Shjarback & White, 2015). The differing – and mostly problematic – results between officer training and uses of force could be due to variation in training quality as well as differences in the amount of training based on regional differences and disparate policies between departments (Morrison, 2006).

Departmental Policies

Policies implemented by departments have had various effects on the number of complaints received (Cao & Huang, 2000; Hickman, Piquero, & Greene, 2000; Kessler, 1999; Worrall, 2002) as well as the number of complaints sustained (Cao & Huang, 2000; Terrill & Ingram, 2016). Perhaps the most controversial and publicly debated of departmental policies is the citizen review board (for a review of this controversy, see Walker, 2006). Initially carried out in Washington, D.C. and New York in the mid-1900s, these boards serve as an independent investigatory body over police misconduct allegations. Although civilian complaint review boards (CCRBs) are implemented to inject impartiality into the complaints review process, research does not paint such a clear picture. At least two studies have found that agencies with CCRBs are less likely to find officers guilty of misconduct (Hickman, 2006; Hickman & Piquero, 2008). Recently, Terrill and Ingram (2016) found that cities where oversight of case outcomes fell to external civilian review were significantly more likely to sustain complaints. Other studies, however, find no significant differences between agencies who have a CCRB and

those who do not (Cao & Huang, 2000). Accordingly, the role that CCRBs play in sustained use of force complaints is very much an unresolved matter in the research literature.

Much like the results regarding citizen review boards, research studying the effects of community policing on citizen complaints also has mixed results. Community policing initiatives have been introduced as a way to not only involve the community in their own policing, but as a way to ease tensions and build relationships between law enforcement agencies and the communities they serve (Community Oriented Policing Services, n.d.). However, Hickman, Piquero, and Greene (2000) found that community policing generated complaints at an equivalent rate to traditional policing roles in one Philadelphia-area police department. Morrison (2006) also concludes that there is a non-significant difference in complaints received based on whether or not a department participates in community policing. Alternatively, a study of a Houston-area police department demonstrates that officers assigned to areas that implemented community policing garnered significantly fewer complaints than those who were working in other areas (Kessler, 1999). As such, many questions remain about the role of community policing practices and their relationship to the number of sustained complaints.

While research on the use of lethal force by law enforcement officers has garnered much attention from researchers, less-than-lethal force policies have not attracted the same level of interest until recently. A focus of this research is on what types of less-than-lethal policy framework agencies implement. In this vein of research, Terrill and Paoline (2017) found that officers working within the most restrictive policy framework regarding non-lethal force used force less readily than officers who operated within more permissive policy environments. Importantly, several studies conclude that using less lethal force tactics resulted in fewer instances of using lethal force (Ferdik, Kaminski, Cooney, & Sevigny, 2014; McEwen, 1997;

Thomas, Collins, & Lovrich, 2010). From the standpoint that agencies will naturally have fewer complaints if they have less use of force incidents, this research is highly relevant and carries great importance to studies that investigate complaint volume and sustained complaint volume alike.

Three other departmental policies have been demonstrated to affect the number of citizen complaints. First, Cao and Huang (2000) found that a reporting requirement for officers is positively related to the number of citizen complaints about police abuse of power. Second, the same authors also found that requiring citizens to have medical evidence before filing a complaint is negatively associated with citizen complaints. Third, agencies that have automated complaints databases receive more complaints than those without them (Worrall, 2002). While these findings speak to the volume of civilian complaints, they do not speak to the number which are specifically sustained. However, their established importance in complaint volume serves as the basis which would warrant such an investigation.

Pre-employment Screening

Recruiting and retaining the top talent in law enforcement has become paramount for agencies (see White & Escobar, 2008). As a result, there has been a substantial amount of research on what is effective in terms of pre-employment screening. One factor – education level – has garnered substantial attention. Many studies demonstrate that level of education is important for many aspects of a police officer's position (Aamodt & Flink, 2001; Rydberg & Terrill, 2010; Stickle, 2016). In addition to being important for academy performance (Aamodt & Flink, 2001), higher levels of formal education tended to be associated with fewer injuries (Cascio, 1977) and more positive supervisor evaluations (Smith & Aamodt, 1997). Like in these

other elements of policing, education requirements have equally meaningful implications for uses of force.

Perhaps most notably, higher education requirements at the departmental-level are associated with lower departmental use of force complaints (Stickle, 2016). In particular, some evidence suggests that having officers with a college education is especially effective at reducing the likelihood of uses of force occurring (Rydberg & Terrill, 2010). Similarly, Paoline and Terrill (2007) found that encounters involving officers with any college education result in significantly less verbal force compared to those with a high school education, and citizen encounters involving officers with a four-year degree result in significantly less physical force. Pertaining directly to this study, Lersch and Kunzman (2001) find that officers who have not earned either a two or four-year degree have significantly more complaints and more sustained complaints than those with a college degree (however, cf. Brandl et al. 2001; Sherman & Blumberg, 1981; Smith, 2004).

Partially due to mixed empirical results, the use of personality and psychological tests in the pre-employment screening of candidates has been surrounded by controversy. Personality tests – used as a way to predict aggression in police officers – have not been used uniformly across agencies, leading to questions about the comparability of research on their effectiveness. Partially as a result of vast subjective variance on personality assessments, there has been a concerted effort to provide some standardization to them. As a result, the Minnesota Multiphasic Personality Inventory (MMPI) has become widely used in screening of candidates. However, results on the predictive validity of the MMPI as a screening tool are mixed, with Tarescavage and colleagues (2015) finding that it effectively predicts aggressive behaviors in candidates while other studies finding no effect (Castora, Brewster, & Stoloff, 2003; Laguna, Agliotta &

Mannon, 2015). Despite the mixed findings, there is at least some evidence that links personality screening to aggression among officers (Kane & White, 2009), meaning that it may very well be relevant to both complaints against officers as well as sustained complaints, thus raising attention to the specific goals of this study.

Current Study

This study seeks to further understand and explore how community characteristics and law enforcement agency characteristics relate the number of sustained use of force complaints in law enforcement agencies. Broadly, we expect that both community and agency factors will relate to sustained complaints. Specifically, we draw from prior studies linking race to complaint filings (e.g., Lersch, 1998) and complaint outcomes (e.g., Terrill & Ingram, 2016) to hypothesize (H1) that communities with sizable nonwhite populations will have significantly fewer sustained use of force complaints. To gain the most precise estimate of the relationship between community racial characteristics and complaint outcomes, we control for the geographical area of the country where the police department is situated.

Regarding law enforcement agency characteristics, we draw from prior studies on training and use of force (e.g., Lee et al. 2010; Smith, 2004) to hypothesize (H2) that training hours will be positively related to the number of sustained use of force complaints. That is, we expect that departments with more extensive training curricula will have more complaints sustained. We also hypothesize (H3) that agencies which implement rigid departmental policies about how to process use of force complaints will have significantly higher numbers of sustained complaints than departments without such policies. Finally, we build upon past research on the effectiveness of employment screening (e.g., Rydberg & Terrill, 2010; Tarescavage et al., 2015)

and hypothesize (H4) that departments that implement pre-employment screens will have significantly fewer sustained use of force complaints than departments without such screening processes.

Methods

Data and Sample

To study sustained use of force complaints, we use a hybrid dataset that combines information from multiple sources. The first source of information comes from the Law Enforcement Management and Administration Statistics (LEMAS) 2007 dataset (U.S. Department of Justice, Bureau of Justice Statistics, 2007). LEMAS presents information on a representative sample of 3,095 general-purpose state and local law enforcement agencies in the United States, and includes state police, local police, and sheriff departments. Local police agencies were selected using a stratified random sample and sheriff offices were selected using a simple random sample. Of the 3,095 agencies selected, a total of 2,840 agencies completed the LEMAS instrumentation, indicating a high response rate (91.8%). A total of 1,743 agencies provided a non-missing, valid answer to our dependent variable, the number of sustained complaints. Collected from December 2007 to December 2008, the LEMAS dataset includes information about technologies used by officers, departmental policies, budgets, demographics, and other important information about law enforcement agencies. Based originally in a census of law enforcement agencies taken in 2004 by the Bureau of Justice Statistics, the LEMAS sample includes 950 agencies with 100 or more sworn personnel and 2,145 agencies with fewer than 100 sworn personnel.

The data sources we combine with the LEMAS data contain a rich assortment of information about the communities that departments serve. These data come from the 2009 American Community Survey (ACS; United States Census Bureau, 2009) and the Uniform Crime Reports in 2007 (United States Department of Justice, Federal Bureau of Investigation, 2007). Focused on a total of nearly two million individual households, the ACS used random sampling techniques to survey addresses via mail, internet, and computer-assisted survey techniques. For this project, we use the individual household data to construct county-level demographic information about the communities the law enforcement agencies serve. The Uniform Crime Reporting Program includes data on violent and property crimes known to the police aggregated at the county-level. These counts are monthly and include all official reports of index crimes received from victims, officers, or other sources, except for arson. For the purpose of this article, we use UCR offense count data and ACS population data to construct crime rates for communities (number of index crimes per 100,000 people in the population).

Measures: Dependent Variable

The dependent variable in this study captures the number of sustained use of force complaints each agency reported. Departments were asked to indicate the current disposition of all formal citizen complaints received during 2006 regarding use of force. The LEMAS data defines sustained complaints as those which were found to have sufficient evidence to justify disciplinary action against the officer[s] involved in the use of force. This variable is a natural count variable and has a mean of 1.338, a standard deviation of 11.524, and a range of 0 to 264. Different constructions of this variable were considered, but were hampered by practical issues. This is further discussed in the forthcoming sensitivity analysis after the results section.

Descriptive statistics of all analysis variables can be found in Table 1. Additionally, Appendix A reports correlations for all analysis variables.

** Table 1 About Here **

Measures: Independent Variables

Demographics and region.

The first group of independent variables captures characteristics of community demographics and region. These measures come from the ACS and UCR. The first measure, *percent nonwhite population*, captures the percentage of nonwhite population in the county the law enforcement agency is located in (20.1% is the mean percent nonwhite; observed range of approximately 0 to almost 100). The second measure captures *region* of the United States as defined by the Census. Specifically, dummy variables are created that distinguish whether the agency is situated in the Northeast part of the United States, the West, or the South. Midwest serves as the contrast group. The third measure captures the *crime rate* in the county which the law enforcement agency is located. After eliminating one extreme outlier, the average crime rate is 3,672.11 crimes per 100,000 people (standard deviation = 3,530.25; range = 0 – 24,935.06). It is created using the formula: $([\text{total number of crimes}/\text{total population}] * 100,000)$. Finally, the fourth measure indicates the *median income* in the county where the department is located (mean = 46,136.09; standard deviation = 22,586.25; range = 9,846 – 250,001).

Training hours.

The second group of independent variables captures training hours for both new recruits and experienced officers. These measures come from the LEMAS data. The first measure

capturing training hours is *total field training hours*. Agencies were asked to indicate how many total hours of field training are required of their agency's new (non-lateral) officer recruits, including law enforcement training, state/POST training requirements, and agency training requirements. This measure is a count variable that ranges from 0 to 1,040 with a mean of 447.868 and a standard deviation of 258.653. To restrict the impact of outliers, we truncated this variable at 1,040 hours and then took the natural log to normalize the distribution to correct for a heavy right skew.

The second measure capturing training hours is *total academy training hours*. Similarly, agencies were asked how many total hours of academy training are required of their new (non-lateral) officer recruits, including law enforcement training, state/POST training requirements, and agency training requirements. Like the prior measure, this measure is also a count variable that ranges from 0 to 1,040 with a mean of 677.537 and a standard deviation of 222.581. This measure is also truncated at 1,040 hours to minimize outlier impact on the models, and forthcoming models use a logged version of this measure.

The third measure capturing training hours is *total in-service training hours*. Agencies were asked to record how many hours of in-service training are required annually for their agency's non-probationary field/patrol officers. This variable represents active duty, law enforcement training only. This measure is a count variable that ranges from 0 to 240 with a mean of 36.657 and a standard deviation of 27.061. Again, we use a logged version of this variable to correct for significant skewness.

Departmental policies.

The third group of variables comes from the LEMAS data and captures departmental policies. The first measure representing departmental policies captures whether the agency has a *citizen complaint policy*. Agencies were asked if they have a written policy or procedural directives on citizen complaints. This is a binary variable (0 = agency does not have written policy; 1 = written policy exists). Like the prior measure, most (96.9%) agencies have a written citizen complaint policy (standard deviation = .263).

The second measure capturing departmental policies is *less-than-lethal force policy*. This is a self-reported measure by each agency that captures whether a formal, written policy or procedural directive exists on the use of less-than-lethal force. This is a binary variable (0 = no written policy; 1 = written policy exists). The vast majority (98.5%) of agencies have a written less-than-lethal force policy (standard deviation = .121).

In terms of their *outside investigation policy*, departments were asked if their agency has a written policy requiring that citizen complaints about use of force receive separate investigation outside the chain of command where the accused officer is assigned. This is a binary measure (0 = no written policy; 1 = written policy stating that use of force complaints must be investigated outside of the officer's chain of command). Over a third (36.5%) of agencies have a written policy that use of force complaints must be investigated outside of the officer's chain of command (standard deviation = .482).

Agencies were asked if there is a *civilian complaint review board* in their jurisdiction that reviews use of force complaints against officers in their agency. This is a binary measure where scores of '0' indicate that there is not a civilian complaint review board/agency and scores of '1' indicate that there is a civilian complaint review board/agency that reviews use of force

complaints against officers. Only 9.1% of agencies have a civilian complaint review board/agency (standard deviation = .287).

The final measure capturing departmental policies is *community policing*. Agencies were asked how many of the total number of full-time sworn personnel with general arrest powers are community policing officers, community relations officers, or other sworn personnel specifically designated to engage in community policing activities. Due to skewness, this variable was converted into a binary variable where scores of '0' indicate that the agency has no community policing officers and scores of '1' indicate that the agency participates in community policing activities. Almost two thirds (64.3%) of agencies have one or more officers dedicated to engaging in community policing activities (standard deviation = .479).

Pre-employment screens.

The final set of variables also comes from the LEMAS data and captures the pre-employment screening practices of agencies. Departments were asked to indicate which of the following screening techniques are used by their agency in selecting new officer recruits: A *personality inventory*, an *analytical/problem-solving ability assessment*, an *assessment of understanding of culturally diverse populations*, a *conflict management skills assessment*, and a *volunteer/community service history check*. These measures, which are all binary, are used as standalone variables in the analysis. Over half (55.8%) of agencies use a personality inventory (standard deviation = .497), 36.5% use an analytical/problem-solving ability assessment (standard deviation = .482), 21.9% use an assessment of understanding of culturally diverse populations (standard deviation = .414), 20.1% use mediation/conflict management skills

assessments (standard deviation = .401), and 23.5% use a volunteer/community service history check (standard deviation = .424).

Finally, agencies were asked to indicate their *minimum education requirement* which new (non-lateral) officer recruits must have at hiring or within two years of hiring. The options available to departments were no formal education, a high school/GED requirement, an unspecified requirement about college, a two-year college degree requirement, or a four-year college degree requirement. Based on this variable, we created a new binary variable where scores of '0' indicate a high school or lower education requirement and scores of '1' capture an above high school requirement. Overall, 21.6% of agencies require that new officer recruits have more than a high school diploma (standard deviation = .412).

Analytical Strategy

To analyze how community and agency factors are associated with the number of sustained use of force complaints, we implement a stepwise procedure using regression techniques. In the current case, the dependent variable – the number of sustained complaints – is a count measure which has significant levels of skewness ($p < .001$). Skewed count dependent variables violate the assumptions of ordinary least squares regression, meaning a technique must be used which is capable of correcting this assumption. As such, two regression models were considered: The Poisson and the negative binomial regression. Upon investigating the dependent variable, we find the mean is not approximately equivalent to the variance, resulting in a basic violation of one of the core assumptions of the Poisson model. A likelihood ratio test of the overdispersion parameter (alpha) also demonstrated that significant levels of overdispersion in the dependent variable exist. As a result of both these factors, negative binomial models are the

most appropriate model to be estimated. Since the amount of sustained complaints might vary by state, we explored whether there should be a nesting level in analyses. However, intraclass correlations demonstrated zero variation at level two (the state level; ICC = .000). Accordingly, we estimate single-level models due to a lack of natural nesting in the data (agencies are the only unit of analysis), although we do still control for the region of the country in which the department is located based on U.S. Census Bureau criterion.

The forthcoming models are estimated in a stepwise fashion. Model 1 features region and demographics, Model 2 adds training hours, Model 3 introduces departmental policies, and Model 4 adds pre-employment screening characteristics. Significant levels of heteroskedasticity are present in all models ($p < .001$). To correct for this, we use robust standard errors. To increase interpretability of results, we report incidence rate ratios (IRRs) in place of unstandardized coefficients. The IRR is designed to demonstrate the extent of change in the outcome based on a one-unit shift in the predictor. IRRs are centered around one, meaning that an IRR of one corresponds to a zero percent shift in the dependent variable based on a one unit increase in the predictor. IRR values below one indicate a negative direction effect, and values above one demonstrate a positive direction effect. In the case of this study, the IRR will demonstrate the magnitude of a one unit increase in the predictor on the expected value of the number of sustained complaints that a department has. Due to the use of IRRs, the standard error estimates reflect a variation around the IRR's point estimate instead of variation around the coefficient.

In the LEMAS 2007 data, many agencies failed to report information. As opposed to imputing these values and working under the assumption that the data have missingness at random, these agencies are removed using listwise deletion. This results in a final sample size of

$n = 763$ agencies. All models were checked for multicollinearity. These multicollinearity checks aided in the removal of several other potentially important independent variables, including the number of male officers (very highly correlated with several variables since more male officers exist in larger departments), the total number of sworn law enforcement officers (collinear with population demographics), and number of white officers (also collinear with population demographics). All models were estimated with Stata version 15.1.

Results

Prior to presenting multivariate results, we first provide a descriptive analysis to help position our study within the broader research. In line with prior studies (Hickman, 2006; Liederbach et al., 2007), we find that about around one in ten (9.755%) use of force complaints is sustained. Although there is variation around this mean (SD = 20.912%), if only ~10% of use of force claims are sustained, that means that 90% of complaints are not. This indicates that complaints about police use of force are overwhelmingly unfounded, unjustified, not sustained, or withdrawn (see U.S. Department of Justice, Bureau of Justice Statistics, 2007). Figure 1 presents a scatterplot that features the number of sustained use of force complaints on the x -axis and the total number of use of force complaints on the y -axis. As would be expected, the two variables under consideration share a strong, positive correlation ($\rho = .710, p < .001$) with one another. The best fit line in the scatterplot also indicates that there is indeed a strong trend in the positive direction. As such, this figure demonstrates something substantively important: On the whole, agencies with more complaints sustain more complaints. Thus, our hybrid dataset appears to produce findings that are similar to results from prior studies suggesting a relationship between total complaints received and the number sustained (e.g., see Dugan & Breda, 1991).

**** Figure 1 About Here ****

Moving to the multivariate framework, Table 2 shows results from a series of stepwise negative binomial regression models which regress the number of sustained complaints onto various predictors. The first step model, Model 1, is significant. Percent nonwhite population is positive and significantly related to the number of sustained use of force complaints. The IRR indicates the magnitude of the effect is relatively strong: As the nonwhite population increases one percentage point, approximately 44 times more complaints are sustained (IRR = 43.990). This indicates that agencies serving larger nonwhite populations sustain more use of force complaints. IRRs equivalent to or near one for crime rate, median income, and the regional variables based on the classification scheme developed by the U.S. Census demonstrate that these variables have very weak relationships with the number of sustained complaints. As such, these variables are not statistically significant.

**** Table 2 About Here ****

Model 2 introduces variables capturing training hours. Again, this model is significant and the model statistic has increased in magnitude. Furthermore, two commonly used fit indices – the Aikake’s Information Criteria (AIC) and the Bayesian Information Criteria (BIC) – have both moved towards zero compared to the first model. Collectively, this indicates that Model 2 has a closer fit to the data than Model 1.

In Model 2, two variables reach statistical significance. While percent nonwhite population is again significant (IRR = 33.255), total academy training hours also reaches levels of statistical significance (IRR = 2.280). While the magnitude of the effect of nonwhite population has decreased from Model 1 (the IRR was ~44), a very high IRR indicates that percent nonwhite population still carries a sizeable relationship with the number of sustained

complaints. However, the IRR indicates that the direction of academy training hours is positive. For a one unit increase in logged academy training hours, departments sustain approximately 2.3 times more complaints. Together, this illustrates that agencies serving larger nonwhite populations and those who train their officers longer in the academy sustain more use of force complaints, respectively. Northeast, West, South, crime rate, median income, total field training hours and total in-service hours are not statistically significant.

Model 3 introduces variables representing departmental policies. This model is significant and, again, the model statistic has increased and the AIC and BIC have moved towards zero, indicating overall better fit for the data compared to Models 1 and 2. Percent nonwhite population (IRR = 15.898) and total academy training hours (IRR = 2.038) remain significant. Additionally, having a citizen review board (IRR = 3.560) and having officers dedicated to community policing (IRR = 1.994) are both positive and significantly related to the number of sustained use of force complaints. Specifically, agencies that have a citizen review board sustain 3.56 times more complaints than agencies that do not have such an entity. Likewise, having officers dedicated to community policing nearly doubles the number of complaints a department sustains. This shows that agencies that serve larger nonwhite populations, train their officers longer in the academy, have a citizen complaint review board, and dedicate officers to community policing sustain more use of force complaints, respectively. IRR values at or near one for all other measures indicate that the majority of controls are not statistically significant.

Finally, Model 4 introduces variables capturing pre-employment policies. Again, this model is significant and the overall fit of the model has improved over the prior models. While the percent nonwhite population in the agency's county (IRR = 12.792), having a citizen review

board (IRR = 2.770), and a community policing focus (IRR = 1.765) all remain significant, the total number of academy training hours drops out of the model when the pre-employment variables are entered into the equation. Two of the pre-employment screening variables also reach levels of statistical significance. A significant IRR over one (IRR = 1.609) indicates that departments which administer personality tests sustain approximately 60% more complaints than departments that do not administer personality tests when assessing officer candidate applications. A significant IRR below one (IRR = 0.630) demonstrates that agencies that check volunteer history in their pre-employment screens have significantly less sustained complaints than departments without volunteer history screens. Specifically, departments that check a candidate's volunteer history have 37% less sustained complaints than departments that do not implement this screening tool.

Sensitivity Analysis

Research has emphasized the importance of replication and sensitivity analyses in criminological research (Barnes, TenEyck, Pratt, & Cullen, 2018). In light of this recognition, we estimated a series of additional models with three different constructions of the dependent variable: (1) the percentage of total use of force complaints which were sustained (percentage sustained = $[\text{sustained complaints}/\text{total complaints received}] * 100$; mean = 10.111% ; SD = 21.855%; range = 0 – 100], (2) the proportion of sustained complaints to the department's total number of officers (sustained complaints-to-officers = $\text{sustained complaints} / \text{total number of full-time sworn officers}$; mean = 0.013; SD = 0.092; range = 0 – 2), and (3) a rate of sustained complaints per 100,000 people in the population (rate of sustained complaints = $[\text{sustained complaints}/\text{total population}] * 100,000$; mean = 3.044; SD = 19.274; range = 0 – 334; one

extreme outlier was truncated). Though they are not count variables, each of these different outcomes had a highly skewed distribution. Therefore, we took the natural log of each and estimated three separate OLS regression models (negative binomial models were no longer appropriate due to not having count data). The first and second alternative dependent variables required robust standard errors to correct for significant amounts of heteroskedasticity. Based on ICC values, these alternative outcomes did not vary significantly by state. As such, these alternative models were again confirmed to be single-level models, although we still control for U.S. Census region.

Despite having the models successfully estimate, each of these models suffered from severe issues with missing data. Whereas our models used 763 departments, our analytical sample size with these different dependent variable constructions decreased to 270, 266, and 270, respectively, due to missing data on the denominators. Due to losing approximately 65% of our sample and having only 35% of the same departments in the alternative models, these results are not easily comparable to the findings previously reported. As a result of having limited utility in assessing the sensitivity of our results, these models are not reported.

Due to limited variability in some of our independent variables, we also re-estimated analyses in this paper where departmental policy characteristics were combined into an index (mean = 3.051; SD = 0.901; range = 0 – 5) and pre-employment screening measures were combined into a separate index (mean = 1.795; SD = 1.615; range = 0 – 6). After re-estimating models, the departmental ($p \leq .001$) and pre-employment ($p = .043$) indices were both positive and significant, which makes some sense considering that there was significant variation in both indices' individual components. However, including these indices in place of their individual components decreases the level of nuance that our results are able to provide. Since a major

policy recommendation comes from the individual components of one of these indices (see the forthcoming discussion section), the prior results are most informative at the individual-item-level.¹

Discussion & Conclusions

Sustained use of force complaints are an important but understudied facet of police-community relations. While previous studies focus on individual-level predictors or case studies of specific agencies, this article sought to study what is associated with the number of sustained use of force complaints in law enforcement agencies across the U.S. To do this, we used an integrated data source and implemented model building techniques which regressed the number of sustained uses of force a department experienced onto characteristics of the community (racial composition, region, crime rate, and median income) and the agency (training tendencies, departmental policies, and pre-employment screening tendencies). Overall, results demonstrate that demographic characteristics of the local community, certain departmental policies, and two pre-employment screening practices are the most salient factors which relate to sustained uses of force. In this section, we elucidate the main findings of this study, review key policy implications, discuss limitations, and offer some concluding remarks about sustained uses of force at the national level.

With a coefficient that was dramatically larger than any other independent variable in the multivariate models, the percentage of the nonwhite population in the area served by the police agency was robustly and positively related to the number of sustained use of force complaints. This finding remained throughout the model building process and remained highly significant

¹ We would like to thank our anonymous reviewers for detailed comments regarding the supplemental analyses.

even when accounting for training practices, departmental policies, and pre-employment screening tendencies. The consistency and strength of this relationship demonstrates the independent importance of demographic characteristics of the community which a law enforcement agency is serving in relation to sustained uses of force. At face value, a potential recommendation from this finding could be that there seems to be a need to build stronger relationships between law enforcement agencies and the communities with which they interact. However, this seemingly clear policy recommendation is more complicated than it seems.

Results about the relationship between community policing and sustained use of force complaints are quite nuanced and bear considerably upon the prior recommendation. In this study, agencies that dedicate officers to community policing have significantly higher numbers of sustained use of force complaints. This finding demonstrates that more contact with the community has a meaningful – but complicated – relationship with the number of sustained uses of force. There are at least two competing explanations for why this relationship exists. First, it is plausible that more contact with communities leads to more uses of force against those communities simply because there are higher levels of officer-community exposure. Stated differently, officers in community policing-focused departments will have more opportunities to use force and receive complaints about the uses of force if they spend a considerable amount of time in those communities. Alternatively, the competing explanation of this finding could perhaps be that effective community policing practices may have strengthened the police-community relationship so much that it provides for a more transparent, ‘restorative’ type of complaint process that values input from both officers and citizens. Despite both being potentially valid explanations, this study stops short of definitively being capable of saying

which one (or both) is most supported, making this a fruitful avenue for future research which carries an impactful level of social importance.

Also pertaining to departmental policies, another thing is abundantly clear: Departments with established citizen review boards have significantly more sustained complaints against officers. While previous research demonstrates mixed findings regarding the impact of citizen review boards on sustained complaints (Cao & Huang, 2000; Terrill & Ingram, 2016), our national-level results demonstrate that agencies with citizen review boards do in fact tend to sustain more complaints than those without.

Another important finding from our study pertains to a series of non-significant training variables. When pre-employment screening practices were added into the final model, total academy hours – which had previously been statistically significant throughout the model building process – dropped from significance. As a result, none of the three variables capturing training tendencies were significantly related to the number of sustained uses of force within departments. Instead, training tendencies were proven spurious by pre-employment practices. This suggests that when agencies implement personality tests and a volunteer history check in their pre-employment screenings, the amount of training hours officers receive ceases to be of importance in respect to the number of sustained complaints against uses of force.

While this again seems to paint a relatively clear picture at face value, the direction of the relationships between the two significant pre-employment screening variables (personality tests and volunteer history checks) complicates the interpretation. Notably, personality tests share a positive relationship with sustained complaints, while volunteer history shares a negative relationship. The first of these two findings indicates that agencies that implement personality tests have significantly higher sustained use of force complaints. While seemingly

counterintuitive, this finding actually makes a good deal of sense when viewed from the perspective of selection effects. It very well could be that departments who have had problems with uses of force have selected in to offering personality tests in their pre-employment hiring practices. Unfortunately, data limitations prevent us from confirming this hypothesis, though we note that future research should explore the link between sustained use of force complaints and implementation of personality tests among police departments.

The latter of these two findings demonstrated that departments that implement volunteer history screens sustain significantly less complaints than those that omit this tool during the hiring process. This significant, negative direction effect raises attention to a clear policy recommendation. Based on the results of this study, departments seeking to reduce the number of sustained complaints against them should incorporate a screening tool that evaluates a candidate's prior community service and volunteer history record. It is likely that involvement in the broader community demonstrates a service-oriented mindset that translates well for police work (see U.S. Department of Justice, Office of Community Oriented Policing Service, 2006). In order to reduce the number of use of force complaints that a department sustains, candidates who exhibit a more committed background to community service and volunteer work should be given preference in hiring decisions. Our findings suggest that this could produce impactful and noticeable results. Based on the IRR, departments could expect a 37% decrease in the number of sustained complaints if volunteer and community service screening tools were implemented and used in hiring decisions. These screening tools are relatively simple and easy to implement at little to no extra cost. As a result of this, there is very little downside to departments universally adopting community and volunteer service history screens during the hiring process.

Despite having important findings that pertain to law enforcement agencies everywhere in the U.S., our study is not without limitations. First, the LEMAS portion of our hybrid dataset has a large amount of missing data. Despite the fact that agencies routinely failed to answer questions on this dataset, our use of listwise deletion has kept results in this case as valid and conservative as possible. Second, due to issues of multicollinearity between LEMAS and ACS variables, there were several potentially important variables that were excluded (see the end of the Analytical Strategy section). This speaks to the intertwined nature of departmental characteristics, use of force complaints, and characteristics of the community. Third, while a unique strength of this study, departmental data offer a vivid, but nonetheless limited, view of factors related to use of force complaint outcomes. An alternative to agency-level data would be using officer-level data. This would establish a link between individual incidents and departmental characteristics as well as community characteristics, thus improving the understanding of the relationship between departments and individual use of force complaints.

A fourth limitation involves the timing of the measures in our hybrid dataset and the positive direction finding between personality screens and sustained uses of force. It is reasonable to assume that some departments may have implemented personality screens in their hiring practices in response to having sustained complaints against their officers. If this is true, then these same departments could be driving a portion of the covariance between personality screens and sustained complaints. As such, the interpretability of our results is somewhat restricted by using a hybrid dataset consisting of time-static variables. This is further realized by the observation that concerns over omitted variable bias are never fully resolved. While we have attempted to mitigate this concern through the use of several datasets and a thorough exploration of measures used in these datasets (see the preceding discussion of multicollinearity in the

Analytical Strategy section), there are nonetheless other measures that may explain variance in the dependent variable.

A related, fifth limitation that bears on interpretability is that our study does not capture citizen perceptions of use of force. There is ample evidence suggesting that citizen perceptions differ from that of law enforcement officers (Klockars, 1996). Our hybrid data only allow us to study the departmental viewpoint regarding the complaint and the pathway through which the case was processed. In a related manner, our data were all collected prior to the Michael Brown incident in Ferguson, Missouri. Not only has Ferguson impacted citizen perceptions of police (Culhane, Boman, & Schweitzer, 2016), it may have changed policing in general (Shjarback, Pyrooz, Wolfe, & Decker, 2017). Given the significance of this event as it relates to policing and use of force, research with more current data is warranted. This research could also bear in mind that jurisdictions often contain multiple departments that serve both similar and different populations. Since these departments are likely to have different policies, complaint processes, and characteristics, these nuances could potentially impact the amount of use of force complaints that end up being sustained. As such, the community and departmental measures in this study all could be potentially further understood as being nested within jurisdiction, community, or even neighborhood-level. This is an intriguing possibility that would introduce an extra potential level of variance that should be explored by future research.

Finally, a sixth limitation concerns the LEMAS data itself. Though the LEMAS data contain some of the only department-level data on use of force complaints available (Shjarback & White, 2015), Hickman (2006) notes that examining citizen complaint data requires caution for a variety of reasons. For example, agencies often vary greatly in how they record and process citizen complaints, and a citizen's decision to file a complaint is likely affected by a wide-range

of factors not directly associated with the agency or specific police-citizen interaction. Likewise, rather than indicate strong community-police relations, a low number of use of force complaints could indicate that the complaint process is not accessible to citizens (Hickman, 2006). Hickman and Poore (2015; 2016) note that the LEMAS data also suffer from measurement flaws, particularly in regards to how citizen complaint data were gathered. Taken together, future research should consider additional data sources in which to examine the links between police and community characteristics and use of force complaints.

Despite having some limitations, this study contributes to a growing, highly important, and socially relevant set of studies that focus on correlates of sustained use of force complaints. Heading into the future, there is little reason to suspect that the public's established – and increasing (Culhane et al., 2016) – interest in police use of force incidents will waiver. Amid mixed results from our hypotheses, our findings highlight a variety of factors that are ineffective at reducing the number of sustained complaints in response to police uses of force. However, there appears to be one simple, cost-effective thing that police administrators can do to significantly reduce the number of sustained complaints: Implement volunteer and community service history tools into the hiring process and prioritize applications from prospective officers who have demonstrated a firm commitment to the broader community. If our results serve as any indication, simply screening for a candidate's commitment to volunteering their time to community improvement can reduce the number of sustained complaints by over a third.

References

- Aamodt, M. G., & Flink, W. (2001). Relationship between educational level and cadet performance in a police academy. *Applied HRM Research*, 6(1), 75-76. Retrieved from http://maamodt.asp.radford.edu/Research%20-%20IO/MS%206_1_%20Aamodt.pdf
- Ajilore, O., & Shirey, S. (2017). Do #AllLivesMatter? An evaluation of race and excessive use of force by police. *Atlantic Economic Journal*, 45(2), 201-212. doi:10.1007/s11293-017-9538-6
- Alpert, G.P., & MacDonald, J.M. (2001). Police use of force: An analysis of organizational characteristics. *Justice Quarterly*, 18(2), 393-409. doi: 10.1080/07418820100094951
- Bailey, W. (1996). Less-than-lethal weapons and police-citizen killings in US urban areas. *Crime & Delinquency*, 42(4), 535-52. doi: 10.1177/0011128796042004003
- Barnes, J. C., TenEyck, M. F., Pratt, T. C., & Cullen, F. T. (2019). How powerful is the evidence in criminology? On whether we should fear a coming crisis of confidence. *Justice Quarterly*, 1-27. Advance online publication. doi: 10.1080/07418825.2018.1495252
- Brandl, S. G., Stroshine, M. S., & Frank, J. (2001). Who are the complaint-prone officers?: An examination of the relationship between police officers' attributes, arrest activity, assignment, and citizens' complaints about excessive force. *Journal of Criminal Justice*, 29(6), 521-529. doi: 10.1016/S0047-2352(01)00114-3
- Campaign Zero. (n.d.). Retrieved from <https://www.joincampaignzero.org/#vision>
- City of Canton, Ohio v. Harris*, 489 U.S. 378. (1989).
- Cao, L., & Huang, B. (2000). Determinants of citizen complaints against police abuse of power. *Journal of Criminal Justice*, 28(3), 203-213. doi:10.1016/s0047-2352(00)00036-2
- Cascio, W. F. (1977). Formal education and police officer performance. *Journal of Police Science & Administration*, 5(1), 89-96. Retrieved from <https://psycnet.apa.org/record/1979-34954-001>
- Castora, K., Brewster, J., & Stoloff, M. (2003). Predicting aggression in police officers using the MMPI-2. *Journal of Police and Criminal Psychology*, 18(1). doi: 10.1007/BF02802602
- Community Oriented Policing Services. (n.d.). About the COPS office. Retrieved from <https://cops.usdoj.gov/aboutcops>
- Culhane, S. E., Boman IV, J. H., & Schweitzer, K. (2016). Public perceptions of the justifiability of police shootings: The role of body cameras in a pre- and post-Ferguson experiment. *Police Quarterly*, 19(3), 251-274. doi: 10.1177/1098611116651403
- Dugan, J.R. & Breda, D.R. (1991). Complaints about police officers: A comparison among types and agencies. *Journal of Criminal Justice*, 19(2), 165-171. doi: 10.1016/0047-2352(91)90050-6

- Ferdik, F. V., Kaminski, R. J., Cooney, M. D., & Sevigny, E. L. (2014). The influence of agency policies on conducted energy device use and police use of lethal force. *Police Quarterly*, 17(4), 328-358. doi: 10.1177/1098611114548098
- Griswold, D. B. (1994). Complaints against the police: Predicting dispositions. *Journal of Criminal Justice*, 22(3), 215-221. doi: 10.1016/0047-2352(94)90018-3
- Harris, C. J. (2009). Exploring the relationship between experience and problem behaviors: A longitudinal analysis of officers from a large cohort. *Police Quarterly*, 12(2), 192-213. doi: 10.1177/1098611108327314
- Hickman, M. J. (2006). *Citizen complaints about police use of force*. Bureau of Justice Statistics.
- Hickman, M. J., & Piquero, A. R. (2008). Organizational, administrative, and environmental correlates of complaints about police use of force. *Crime & Delinquency*, 55(1), 3-27. doi: 10.1177/0011128708316977
- Hickman, M. J., Piquero, A. R., & Greene, J. R. (2000). Does community policing generate greater numbers and different types of citizen complaints than traditional policing? *Police Quarterly*, 3(1), 70-84. doi: 10.1177/1098611100003001003
- Hickman, M. J., & Poore, J. E. (2015). *Assessing the validity and reliability of national data on citizen complaints about police use of force*. Washington, D. C.: Office of Justice Programs
- Hickman, M. J., & Poore, J. E. (2016). National data on citizen complaints about use of force: Data quality concerns and the potential (mis)use of statistical evidence to address police agency conduct. *Criminal Justice Policy Review*, (27)5, 455-479. doi: 10.1177/0887403415594843
- Holmes, M. D. (2000). Minority threat and police brutality: Determinants of civil rights criminal complaints in U.S. municipalities. *Criminology*, 38(2), 343-368. doi: 10.1111/j.1745-9125.2000.tb00893.x
- Hudson, J. (1970). Police-citizen encounters that lead to citizen complaints. *Social Problems*, 18(2), 179-193. doi: 10.2307/799580
- Kane, R. J., & White, M. D. (2009). Bad cops: A study of career-ending misconduct among New York City police officers. *Criminology & Public Policy*, 8(4), 737-769. doi: 10.1111/j.1745-9133.2009.00591.x
- Kessler, D. A. (1999). The effects of community policing on complaints against officers. *Journal of Quantitative Criminology*, 15(3), 333-372. doi: 10.1023/A:1007580632179
- Klockars, C. (1996). A theory of excessive force and its control. In W. A. Geller & H. Toch (Eds.), *Police violence: Understanding and controlling police abuse of force* (pp. 1-22). New Haven, CT: Yale University Press.

- Kramer, R., & Remster, B. (2018). Stop, frisk, and assault? Racial disparities in police use of force during investigatory stops. *Law & Society Review, 52*(4), 960-993. doi: 10.1111/lasr.12366
- Laguna, L., Agliotta, J., & Mannon, S. (2015). Pre-employment screening of police officers: Limitations of the mmpi-2 K-Scale as a useful predictor of performance. *Journal of Police and Criminal Psychology, 30*(1). doi: 10.1007/s11896-013-9135-9
- Langworthy, R., Hughes, T., & Sanders, B. (1995). *Law enforcement recruitment, selection, and training: A survey of major police departments in the U.S. Highland Heights, KY*. Highland Heights, KY: Academy of Criminal Justice Sciences, Police Section.
- Lee, H., Jang, H., Yun, I., Lim, H., & Tushaus, D. W. (2010). An examination of contextual and organizational factors influencing police use of force: A multilevel model. *Policing: An International Journal of Police Strategies & Management, 33*(4), 681-702. doi: 10.1108/13639511011085088
- Lersch, K. M. (1998). Predicting citizen race in allegations of misconduct against the police. *Journal of Criminal Justice, 26*(2), 87-97. doi: 10.1016/s0047-2352(97)00072-x
- Lersch, K. M., Bazley, T., Mieczkowski, T., & Childs, K. (2008). Police use of force and neighborhood characteristics: An examination of structural disadvantage, crime, and resistance. *Policing & Society, 18*(3), 282-300. Doi: 10.1080/10439460802091690
- Lersch, K. M., & Kunzman, L. L. (2001). Misconduct allegations and higher education in a southern sheriff's department. *American Journal of Criminal Justice, 25*(2), 161-172. doi: 10.1007/bf02886843
- Lersch, K. M., & Mieczkowski, T. (2000). An examination of the convergence and divergence of internal and external allegations of misconduct filed against police officers. *Policing: An International Journal of Police Strategies & Management, 23*(1), 54-68. doi: 10.1108/13639510010314616
- Liederbach, J., Boyd, L. M., Taylor, R. W., & Kawucha, S. K. (2007). Is it an inside job?: An examination of internal affairs complaint investigation files and the production of nonsustained findings. *Criminal Justice Policy Review, 18*(4), 353-377. doi: 10.1177/0887403407303799
- McEwen, T. (1997). Policies on less-than-lethal force in law enforcement agencies. *Policing: An International Journal of Police Strategies & Management, 20*(1), 39-59. doi: 10.1108/13639519710162006
- McGregor, A. (2016). Politics, police accountability, and public health: Civilian review in Newark, New Jersey. *Journal of Urban Health, 93*(1), 141-153. doi: 10.1007/s11524-015-9998-4
- Morin, R., Parker, K., Stepler, R., & Mercer, A. (2017). Behind the badge. Retrieved from <https://www.pewsocialtrends.org/2017/01/11/behind-the-badge/>

- Morrison, G. B. (2006). Deadly force programs among larger U.S. police departments. *Police Quarterly*, 9(3), 331-360. doi: 10.1177/1098611105276542
- OpenOversight. (n.d.). Retrieved from <https://openoversight.lucyparsonslabs.com/about>
- Paoline III, E. A., & Terrill, W. (2007). Police education, experience, and the use of force. *Criminal Justice and Behavior*, 34(2), 179-196. doi: 10.1177/0093854806290239
- President's Task Force on 21st Century Policing. (2015). *Final Report of the President's Task Force on 21st Century Policing*. Washington, DC: Office of Community Oriented Policing Services. Retrieved from https://cops.usdoj.gov/pdf/taskforce/taskforce_finalreport.pdf
- Rhodes, D. (2016). Activists continue small but vocal protest against police violence. Retrieved from <https://www.chicagotribune.com/news/local/breaking/ct-chicago-police-protest-0711-20160710-story.html>
- Rydberg, J., & Terrill, W. (2010). The effect of higher education on police behavior. *Police Quarterly*, 13(1), 92-120. doi: 10.1177/1098611109357325
- Sherman, L. W., & Blumberg, M. (1981). Higher education and police use of deadly force. *Journal of Criminal Justice*, 9(4), 317-331. doi: 10.1016/0047-2352(81)90004-0
- Shjarback, J. A., Pyrooz, D. C., Wolfe, S. E., & Decker, S. H. (2017). De-policing and crime in the wake of Ferguson: Racialized changes in the quantity and quality of policing among Missouri police departments. *Journal of Criminal Justice*, 50(1), 42-52. doi: 10.1016/j.jcrimjus.2017.04.003
- Shjarback, J. A., & White, M. D. (2015). Departmental professionalism and its impact on indicators of violence in police-citizen encounters. *Police Quarterly*, 19(1), 32-62. doi: 10.1177/1098611115604449
- Smith, B. W. (2004). Structural and organizational predictors of homicide by police. *Policing: An International Journal of Police Strategies & Management*, 27(4), 539-557. doi: 10.1108/13639510410566262
- Smith, B. W., & Holmes, M. D. (2014). Police Use of Excessive Force in Minority Communities: A Test of the Minority Threat, Place, and Community Accountability Hypotheses. *Social Problems*, 61(1), 83-104. doi: 10.1525/sp.2013.12056
- Smith, S. M., & Aamodt, M. G. (1997). The relationship between education, experience and police performance. *Journal of Police and Criminal Psychology*, 12(2), 7-14. doi: 10.1007/BF02806696
- Stickle, B. (2016). A national examination of the effect of education, training and pre-employment screening on law enforcement use of force. *Justice Policy Journal*, 13(1), 1-15. Retrieved from http://www.cjcj.org/uploads/cjcj/documents/jpj_education_use_of_force.pdf

- Tarescavage, A. M., Fischler, G. L., Cappo, B. M., Hill, D. O., Corey, D. M., & Ben-Porath, Y. S. (2015). Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) predictors of police officer problem behavior and collateral self-report test scores. *Psychological Assessment, 27*(1), 125-137. doi: 10.1037/pas0000041
- Terrill, W., & Ingram, J. R. (2016). Citizen complaints against the police: An eight city examination. *Police Quarterly, 19*(2), 150-179. doi: 10.1177/1098611115613320
- Terrill, W., & Paoline III, E. A. (2017). Police use of less lethal force: Does administrative policy matter? *Justice Quarterly, 34*(2), 193-216. doi:10.1080/07418825.2016.1147593
- Terrill, W., & Reisig, M. D. (2003). Neighborhood context and police use of force. *Journal of Research in Crime and Delinquency, 40*(3), 291-321. doi:10.1177/0022427803253800
- Thomas, K. J., Collins, P. A., & Lovrich, N. P. (2010). Conducted energy device use in municipal policing: Results of a national survey on policy and effectiveness assessments. *Police Quarterly, 13*(3), 290-315. doi: 10.1177/1098611110373995
- United States Census Bureau. (2009). *2005 – 2009 American community survey*.
- United States Department of Justice, Bureau of Justice Statistics. (2007). *Law enforcement management and administrative statistics*.
- United States Department of Justice, Community Relations Service. (n.d.) Importance of police-community relationships and resources for further reading. *Community relations services toolkit for policing*. Retrieved from <https://www.justice.gov/crs/file/836486/download>
- United States Department of Justice, Federal Bureau of Investigation. (2007). *Uniform crime reports data: Offenses known and clearances by arrest, 2007*.
- United States Department of Justice, Office of Community Oriented Policing Service. (2006). *Innovations in police recruitment and hiring: Hiring in the spirit of service*. Retrieved from <https://ric-zai-inc.com/Publications/cops-p090-pub.pdf>
- United States Department of Justice, Office of Justice Programs. (1999). *Use of force by police: Overview of national and local data*. Washington, D.C.: National Institute of Justice and Bureau of Justice Statistics
- Walker, S. (2006). The history of citizen oversight. Retrieved from http://apps.americanbar.org/abastore/products/books/abstracts/5330089samplech_abs.pdf
- White, M. D. (2001). Controlling police decisions to use deadly force: Reexamining the importance of administrative policy. *Crime & Delinquency, 47*(1), 131-151. doi: 10.1177/00111287010470010

- White, M. D., & Escobar, G. (2008). Making good cops in the twenty-first century: Emerging issues for the effective recruitment, selection and training of police in the United States and abroad. *International Review of Law Computers & Technology*, 22(1-2), 119-134. doi: 10.1080/13600860801925045
- Worrall, J. L. (2002). If you build it, they will come: Consequences of improved citizen complaint review procedures. *Crime & Delinquency*, 48(3), 355-379. doi: 10.1177/0011128702048003001
- Yan, H. (2016). States require more training time to become a barber than a police officer. Retrieved from <https://www.cnn.com/2016/09/28/us/jobs-training-police-trnd/index.html>

Tables

Table 1. Descriptives

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Dependent variable				
Sustained use of force complaints	1.338	11.524	0	264
Demographics				
% Nonwhite population	.201	.229	0	1.011
Northeast	.159	.365	0	1
West	.116	.320	0	1
South	.345	.475	0	1
Crime rate	3,672	3,530	0	24,935
Median income	46,136	22,586	9,846	250,001
Training hours				
Total field training hours	447.868	258.653	0	1040
Total academy training hours	677.537	222.581	0	1040
Total in-service training hours	36.657	27.061	0	240
Departmental policies				
Citizen complaint policy	.969	.263	0	1
Less-than-lethal force policy	.985	.121	0	1
Outside investigation policy	.365	.482	0	1
Civilian complaint review board	.091	.287	0	1
Community policing	.643	.479	0	1
Pre-employment screens				
Personality test	.558	.497	0	1
Analytical problem-solving	.365	.482	0	1
Culturally diverse populations	.219	.414	0	1
Conflict management skills	.201	.401	0	1
Volunteer history	.235	.424	0	1
Above high school education	.216	.412	0	1

Table 2. A series of binomial regressions regressing the number of sustained use of force complaints on predictors; $n = 763$.

	Model 1		Model 2		Model 3		Model 4	
	IRR	RSE _{IRR}	IRR	RSE _{IRR}	IRR	RSE _{IRR}	IRR	RSE _{IRR}
Demographics and region								
% Nonwhite population	44.485	35.959***	33.884	27.552***	16.165	10.810***	12.968	7.764***
Northeast	1.513	.847	.882	.540	1.120	.618	1.461	.746
West	.859	.341	.803	.303	.723	.253	.902	.309
South	.798	.289	.797	.272	.943	.297	1.111	.311
Crime rate	1.000	.000	1.000	.000	1.000	.000	1.000	.000
Pop. median income	1.000	.000	1.000	.000	1.000	.000	1.000	.000
Training hours								
Total field training hours	--	--	.691	.153	.830	.149	.775	.133
Total academy training hours	--	--	2.275	.897*	2.033	.711*	1.557	.513
Total in-service training hours	--	--	1.239	.231	1.241	.212	1.327	.221
Departmental policies								
Citizen complaint policy	--	--	--	--	3.317	3.492	3.925	4.044
Less-than-lethal force policy	--	--	--	--	2.044	2.712	3.692	3.131
Outside investigation policy	--	--	--	--	.994	.267	1.027	.247
Civilian complaint rvw. board	--	--	--	--	3.573	1.475**	2.752	1.018**
Community policing	--	--	--	--	1.993	.529**	1.765	.441*
Pre-employment screens								
Personality test	--	--	--	--	--	--	1.607	.383*
Analytical problem-solving	--	--	--	--	--	--	.932	.246
Culturally diverse populations	--	--	--	--	--	--	1.730	.520
Conflict management skills	--	--	--	--	--	--	1.020	.336
Volunteer history	--	--	--	--	--	--	.636	.145*
Above high school education	--	--	--	--	--	--	1.526	.387
Intercept	.798	.593	.018	.051	.000	.003*	.002	.006*
<i>Model Statistics</i>								
Wald χ^2	28.35***		40.29***		71.94***		88.20***	
AIC	2.901		2.892		2.863		2.862	
BIC	-2813.470		-2806.508		-2805.336		-2778.829	

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

IRR = incidence rate ratio

RSE_{IRR} = robust standard error around the IRR's point estimate

Figures

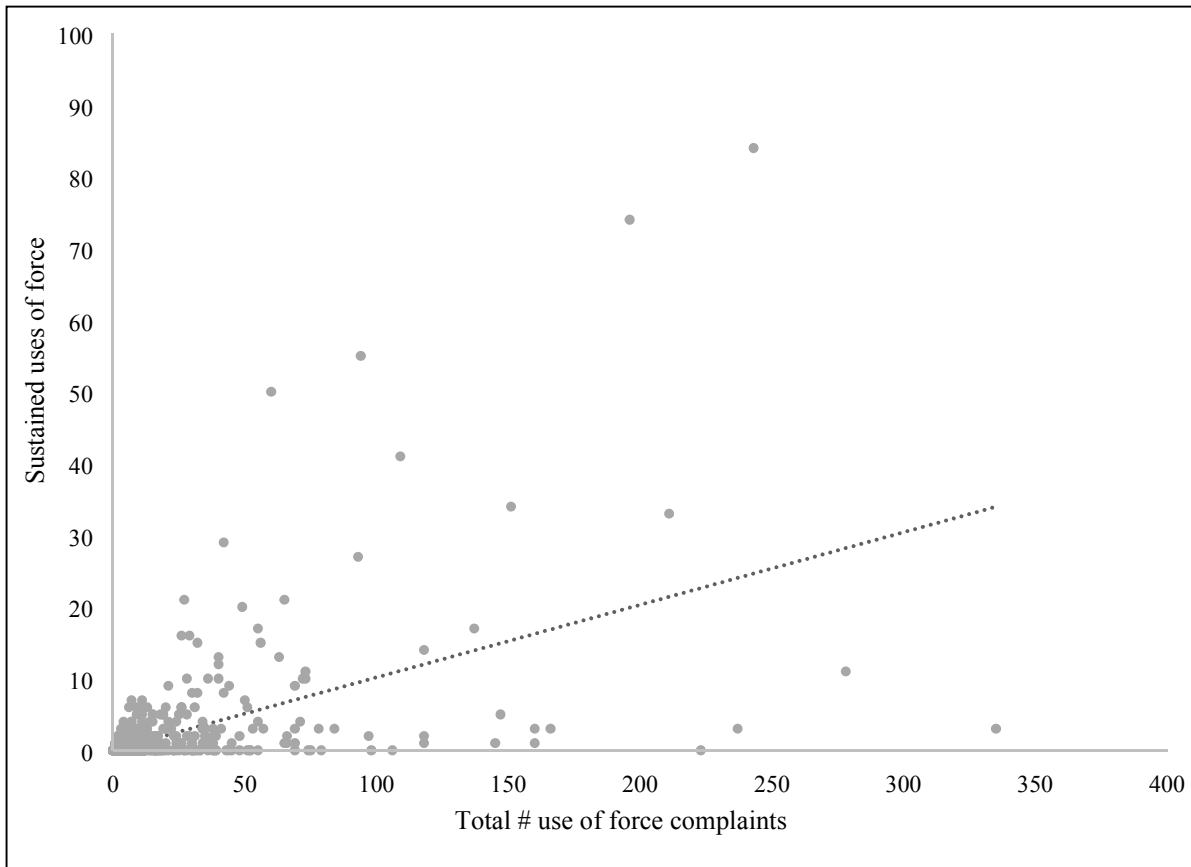


Figure 1. A scatterplot with the number of sustained use of force complaints on the x-axis and the total number of use of force complaints on the y-axis

Appendix A. Correlation matrix; $n = 763$.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Nonwhite population (1)	1.000																				
Northeast (2)	-.020	1.000																			
West (3)	.048	-.158***	1.000																		
South (4)	.212***	-.312***	-.442***	1.000																	
Crime rate (5)	.168***	-.060	.027	.075*	1.000																
Median income (6)	-.283***	.127**	.201***	-.186***	-.094**	1.000															
Total field training hours (7)	.076*	-.215***	.243***	-.091*	.073*	.090*	1.000														
Total academy training hours (8)	.197***	.216***	.218***	-.078*	.047	.205***	.142***	1.000													
Total in-service hours (9)	-.047	-.008	.083*	-.043	-.035	.069	.028	-.043	1.000												
Citizen complaint policy (10)	.088*	-.008	.050	.009	.028	-.003	.157***	.068	-.028	1.000											
Less-than-lethal force policy (11)	-.037	-.078*	.041	-.017	.011	.012	.065	-.012	.032	-.007	1.000										
Outside investigation (12)	.084*	.152***	-.126***	.132***	.065	-.001	-.077*	.070	-.042	-.016	-.013	1.000									
Civilian rev. board (13)	.068	.002	.106**	-.094**	.043	-.092*	.063	.150***	-.035	.034	.027	.168***	1.000								
Community policing (14)	.138***	-.035	-.007	.078*	.055	.027	.173***	.149***	.035	.130***	.048	.108**	.137***	1.000							
Personality test (15)	.034	-.082*	.097**	-.040	.016	.059	.082*	.122***	-.019	-.008	.019	.103**	.133***	1.000							
Analytical problem solving (16)	.010	-.091*	.135***	-.040	.054	.064	.135***	.097**	-.011	.047	.062	.028	.102**	.095**	.233***	1.000					
Cultural diversity (17)	.054	-.066	.087*	-.020	.055	.036	.052	.060	-.026	.051	-.001	.021	.098**	.097**	.173***	.506***	1.000				
Conflict management (18)	-.013	-.063	.079*	-.051	.064	.070	.098**	.100**	-.012	.049	.040	.031	.075*	.103**	.220***	.533***	.623***	1.000			
Volunteer history (19)	-.023	-.009	.092*	-.131***	.030	.082*	.010	.058	.031	-.017	.042	.051	.055	.040	.145***	.257***	.276***	.266***	1.000		
Above high school req. (20)	-.156***	-.069	-.048	-.089*	-.061	.176***	.114**	-.011	-.019	-.022	.040	-.088*	.032	.106**	.014	.083*	.030	.049	.093**	1.000	
Total use of force complaints (21)	.078*	.084*	-.013	-.019	-.007	-.008	-.045	.083**	-.044	.008	.006	.061	.150***	.042	.049	.047	.087*	.080*	.064	.071*	1.000

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$