From copper to steel: Police militarization at the end of the 20th century.

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Abstract

By 2016, ongoing police shootings of unarmed black men had increased public awareness of policing processes; chief among those was militarization. Prior researchers explored this relatively new process, but very few had systematically analyzed it. In this paper, I conceptualize, operationalize, and describe police militarization across the United States. I transformed publicly available data, the Law Enforcement and Administrative Statistics (LEMAS) dataset, into a panel of over 4,000 police departments over an eighteen-year period. I then constructed an index based on each of three dimensions of militarization: (1) increased stock of military equipment; (2) increased usage of paramilitary tactics; and (3) increased focus on military-style policing. I explain the indicators within each sub dimension, and describe their unique trend across time. Using both this Absolute LEMAS Militarization Index (ALMI) and a summary analysis of each indicator, I describe militarization between 1990 and 2007 using hierarchical linear modeling. Among key findings are three trends. First, I provide nationally representative evidence of an increasing trend in police militarization across most departments, despite statistical controls. I also found that larger departments were both more militarized and militarized faster over time than smaller departments. Finally, I found that diverse departments (either proportionately more women or more black officers) militarized at a slower rate over the period. This paper provides the theoretical and methodological basis for follow-up analyses of processes affecting militarization, including variations in crime control, organizational characteristics and racial dynamics.

Introduction

Protests beginning in 2012 have called attention to the militarization of American police departments. The police response to both the Occupy Movement and, later, the protests following the shooting of Michael Brown looked different than such responses had in the past. Officers were clad in heavy armor, pointed nonlethal weapons on protestors, and in some cases drove armored personnel carriers and brandished automatic rifles.

In the past, militarization represented a process of legitimization, marked by uniform standards of behavior and organizational structure. Now, as defined by Peter Kraska (2007), militarization is weaponized; it is a process characterized by an escalation of equipment, a use of paramilitary policing units, a focus on military-style strategy and an adherence to militaristic culture. Criminologists and criminal justice actors agree that this is a troubling trend, harkening to a return to reactive rather than preventative policing. For instance, Kraska and Kappeler (1997) showed that since 1960, the existence and use of paramilitary policing units, most commonly in the form of Special Weapons and Tactics (SWAT) teams, has increased dramatically leading into 1995. Misuses of force associated with paramilitary units have become more common as well, resulting in serious mental and/or physical injury (ACLU, 2014). Into the 2010s, such misuses have become a national issue; some claim agents of law enforcement have lost their way, becoming politicized agents of racialized intent rather than neutral protectors of the peace.

Unfortunately, empirically informed explanations of this trend are few both within and outside the sociological discipline. Since Kraska & Kappeler's original analysis in 1997, militarization has not been sociologically analyzed beyond case studies or anecdotal accounts. The need for a more exhaustive empirical analysis is obvious; this paper begins that project. I develop a measure for militarization drawn from a nationally representative, cross-sectional – turned – longitudinal dataset of police departments. I draw this measure from the Law Enforcement Management and Administrative Statistics (LEMAS, 1987-), a robust dataset collected semi-annually by the Bureau of Justice Statistics. After a review of the process of American militarization, I outline the construction of the dataset, then the conceptualization and operationalization of the Absolute LEMAS Militarization Index (LMI). Finally, I present a descriptive model of the trend of militarization and its associated controls over the period between 1990 and 2007.

Literature Review

Defining Militarization

The analysis of militarization is closely associated with the work of Peter Kraska (2007). According to Kraska and Kappeler (1997), the process of “new” militarization¹ (hereafter just “militarization”) is the combination of four associated trends, as outlined by Figure 1:

¹ The form of militarization they tracked can be considered a form of “new” militarization, contrasted from a kind of professionalization trend in the early 20th century. In the past, militarization was intended as (1) a technique of modernization, whereby the police officer became a true profession informed by organizational rigor, and (2) a system of criminal justice organization, akin to the defensive role of a general working alongside a politically motivated executive (Klockars 1988).

1. *Increased procurement and use of high-powered lethal and non-lethal weaponry.* Nonviolent weaponry includes flash-bang grenades, tear gas, pepper spray, and other equipment most commonly used for crowd control. Other equipment includes mine-resistant armored personnel carriers, full-body armor, bomb-disposal equipment, night vision goggles, and vehicular engine disruption. Most of this equipment has been funded by federal grants, especially from Drug War-centered Byrne grants beginning in the late 1980s, the expanded 1033 Program in 1997, and Community Oriented Policing Services (COPS) grants in the 1990s; a smaller portion comes from donations or aftermarket military surplus (Balko 2013).
2. *Increased use of militarized equipment, especially through paramilitary policing units modeled after military special forces.* Such units are primarily used to execute “no-knock” search warrants, of which most are for non-violent drug offenses. Teams are often composed entirely of men, most of whom are veterans of the military. They are held to high esteem by other police officers.
3. *A shift in strategic and rhetorical focus toward increased crime control through surveillance, intelligence gathering and aggressive patrols.* This is a shift away from the collaborative and trust-building model endemic to community policing, though chiefs of police have been cited as believing it and militarization go hand in hand (Kraska and Cubellis 1997). This shift requires substantial upgrades in information technology, which allows for quick and efficient analysis of crime data. Surveillance ranges from patrol car cameras to aerial drones, allowing for order maintenance without direct officer involvement. Taken together, the intent is to target harden² and efficiently neutralize offenders, rather than facilitate relationship building with local communities.
4. *Increased use of the language and style of the military.* A cultural shift within the agency supports the internal workings of the militarized department, informing its norms and values. SWAT teams are found to exude a hyper-masculine influence on officers (Dodge, Valcore, and Klinger 2010), and increased use of militarized weapons and supporting equipment harkens to idealized notions of being a soldier. Viral videos of local police agencies showing off their newly acquired armored vehicles are accompanied by death metal and cavalier maneuvers. Formal policies on conduct inform police behavior within and without the agency. Perhaps most importantly, police begin to view their role as embattled and adversarial in regards to those they are meant to serve and protect.

The study of American police militarization was kick-started by the work of Peter Kraska. Kraska (1996) uncovered broad organizational changes in police methods after a two-year long ethnography in a SWAT unit. He found that the military-focus endemic to such units was spilling over into the rest of the department. He followed up his initial analysis with a survey sent out to 548 of the largest police departments in the United States. He found that 89.4% (an increase from 59% in 1982) had similar “paramilitary police units” (PPUs) (Kraska & Kappeler, 1997). Combined with further qualitative interviewing with a sub-sample of 81 departments, the authors went on to outline how militarization is not simply a change in equipment; it is a shift in the

² Increase the security around a particular area, usually through surveillance, barriers and other similar defensive security.

Figure 1: Characteristics of the Militarization Process, and a Militarized Department

strategic and cultural structure of the entire agency. This is to say that militarization is not a peripheral process layered on top of the broader mission of policing, nor is it isolated to a SWAT team. It is a process that informs decision-making and internal policy making, affecting the entire agency and field. One can see an obvious link between police militarization and the “Tough on Crime” policy shift beginning in the late-20th century (Beckett and Sasson, 2000); militarization informs much of a department’s structure, and faces little substantive resistance.

Historical Context

Beginning as far back as the 1930s, militarization began with the professionalization of police (Shin et al. 2003). Police reformers like August Vollmer, O.W. Wilson and William Parker wanted law enforcement to be viewed as a profession rather than as a kind of quasi-bodyguard organization marred by cronyism (Wadman and Allison 2004). Professionalization meant creating an organizational structure that supported well-trained, permanent police officers adhering to professional and ethical guidelines. By the 1940s, many departments had professional mission statements, standardized uniforms, basic educational standards, and the logistical support necessary for organizational formalization. For many departments, this change was modeled after military structure, itself guided by a formalized mission, using standardized uniforms, etc. Relatedly, police executives reframed their role in crime control policy; instead of responding to local politicians’ direction on how to police, chiefs asserted direct control in managing crime. While politics surely influenced and continue to influence crime issues, law enforcement executives more directly insisted on managing *how* to carry out policing those issues.

Following this wave of professionalization was the profound civil unrest in the 1950s and 60s, forcing law enforcement to change again. Escalated force policing was failing as a method of crowd control, with its emphasis on increasingly coercive force designed to quash the crowd as quickly as possible. This method was designed for violent riots, however, proving weak (among other reasons) for responding to an organized, non-violent mass. Images of dogs attacking peaceful protestors contributed to a symbolic shift, leading political leaders and other interested parties to seriously question the role of law enforcement (see especially Morris, 1986). Escalated force would give way to negotiated management, a strategy that emphasizes direct partnerships with protestors in order to support a peaceful political action guided by mutual agreement between police and protestor. These shifts in policing were not isolated to crowd management; the content of law enforcement in general was also changing. Proponents of what would become community policing began making headway, with its focus on officers as community workers that take a more active role in preventing crime rather than just responding to it. Community policing is marked by direct involvement of citizens in their own security, often through ongoing, direct partnerships. To that end, community policing is a crime-centered preventative strategy which may have informed negotiated management as a riot-centered preventative strategy (Marx, 1970).

While “softer” changes were permeating in response to public and political pressure, tougher changes were broiling in response to major race riots of the period (Abu-Lughod, 2007). Following the 1966 riots in Los Angeles CA, soon-to-be Chief of Police Daryl Gates developed the first paramilitary policing unit (Balko, 2013).³ In unison with other chiefs and advocates of what would become tough-on-crime crime policies, he argued that Los Angeles’ civil unrest was

³ While another SWAT team formed in Philadelphia to respond to bank robberies, it was Gates’ SWAT that would be most influential to other paramilitary policing units across the country.

characteristic of a growing national crime problem. In consultation with marines stationed in nearby Chavez Ravine, he modeled his SWAT team after a war-time platoon. While controversial at first, other departments came around, and began forming their own SWAT teams while simultaneously stockpiling weapons and equipment. “New” militarization had officially begun.

Following these local changes, federal support arrived on the heels of the formalized “Tough on Crime” policy shift. While president Lyndon Johnson's "War on Crime" (1965) provided initial political support for militarization, it was Nixon's "War on Drugs" that brought militarization roaring into the mainstream (Hall and Coyne 2013; see also Beckett and Sasson, 2000). In practice, the rhetoric of "war" extended both to police strategy and military advisement. New federal grants supported by passed legislation enabled local law enforcement to update their armories and recruit substantially more officers; significantly, it also enabled the military to participate *directly* in domestic law enforcement (Campbell and Campbell 2010; Dunlap 2001). In the early 1980s, this would eventually be supported by weakening the Posse Comitatus Act of 1878 (18 USC § 1385), which limited military involvement in domestic law enforcement efforts (Kopel & Blackman, 1997; Balko, 2013; Kraska, 2007). Using Byrne Grants and 1033 Program dollars established in the 1980s and heavily expanded in the 1990s, law enforcement began receiving direct military aid through formal advising and military equipment transfers (ACLU 2014). With the official intent of combating drug trafficking, this relationship would later expand into anti-terrorism and lead to cross-recruitment, especially from the military into the police. Under federal Community Oriented Policing Services (COPS) grants dispersed between 1995 and 1999, police agencies were incentivized to hire military veterans as police officers, which they did in force (Balko 2006).

In the tough-on-crime policy shift, researchers have tracked countless associated outcomes. These ranged from aggressive policing policies such as "no-knock" raids and "stop-and-frisk" searches (Scheindlin 2013) to stricter sentencing guidelines (Frase 2005) to the panic over a crack cocaine epidemic (Humphries 1999) to the massive increase in incarceration nationwide (Alexander 2012; Beckett and Sasson 2000; Pettit and Western 2004). SWAT teams became less focused on crowd management, and increasingly focused on executing search warrants for (often non-violent) drug offenses (ACLU, 2014; Balko, 2013). It should not be surprising that, as the first roots of militarization originated from a response to race-related social crises, every "tough-on-crime" policy affected and continues to affect blacks more than any other racial or ethnic group in the US. By any metric, for instance by incarceration rates, arrest rates, or likelihood to be a victim of police misconduct, this racial disparity holds (Sampson and Lauritsen 1997; Tonry 1994; Western and Pettit 2005).

Remember that these tough-on-crime changes were occurring during the midst of the rise of community policing, a seeming counter-trend. However, Kraska (2007) found that according to police executives, zero-tolerance policing practices are not counter to, but instead complement, community policing (see also DeMichele and Kraska 2001; Kraska 1996). Relatedly, federal support for community policing had ostensibly *increased* over time, in conjunction with the broader push toward tough-on-crime criminal justice policies. Beginning in 1994, the COPS office dispersed over \$1 billion in grants year to year through 1999 to support community policing recruitment and associated projects (Ahlin and Gibbs 2012; Mastrofski, Worden, and Snipes 1995). According to one police executives:

The only people that are going to be able to deal with these problems (drugs, guns, gangs, and community disorder) are highly trained tactical teams with the proper equipment to go into a

neighborhood and clear the neighborhood and hold it; allowing community policing and problem oriented policing officers to come in and start turning the neighborhood around. (Kraska 2007)

Thus community police serve as a preventative measure only after the neighborhood was "purged" of the especially nasty criminals. In conjunction with the wide literature on tougher policing practices in the late twentieth century, critics of American law enforcement have asserted that this dichotomy is largely a public relations campaign (Klockars 1988; McCulloch 2001). They assert that community policing is but a façade for the more widespread, aggressive, and now militarized approach.

Perhaps validating that argument, support for community policing waned in the post-911 world of domestic security (Kim and de Guzman, 2012). George W. Bush ushered in a new rhetorical war: the "War on Terror." Now, with an increased focus on a terrorist threat, the community outreach and trust building endemic to community policing lacked the support it had garnered in the past. In its place, a new form of policing more conducive to tough-on-crime policies grew in popularity: intelligence-led policing (Dabney 2010; Darroch and Mazerolle 2013; Magers 2004; McGarrell, Freilich, and Chermak 2007). Perhaps best understood as "doing more with less", intelligence-led policing emphasizes systematic crime analysis with the goal of efficiently guiding policing activities (Peak 2013).⁴ This strategy depends on advanced surveillance (especially cameras, but also other sensory technologies like gun-shot detection), systematic analysis of crime and policing outcomes (usually through shared databases like COMPSTAT⁵ (Dabney 2010)), and more efficient, often computerized targeting of manpower and resources. Greater delegation of non-patrol tasks away from sworn officers toward civilian personnel is common (Forst 2000), as is focused patrol of high crime areas (itself an enhancement of "hot spots" policing (Braga, Papachristos, and Hureau 2014)). Based on the growth in popularity of militarization following the Drug War, intelligence-led policing is likely a consequence of militarization rather than a coincidental trend.⁶

Producing Systematic Quantitative Evidence on Militarization

A review of the work on police militarization produces a descriptive picture; we have a fairly strong sense of its history and its basic make-up. However, the phenomenon is relatively new by sociological standards, and the available primary data on the topic is fairly specific or outdated; thus, the lack of scholarship is not necessarily a matter of neglect, but rather of a dearth of data. Quantitative and qualitative accounts have documented police militarization quite exhaustively (see also ACLU, 2014; Balko, 2006; Balko, 2013; Dunlap, 2001; Haggerty & Ericson, 1999), but only a select few have unpacked the empirical national trend. The most exhaustive historical account came from Journalist Radley Balko (2013); he compiled a historical account of militarization using archival records and legal documents, paying special attention to key law enforcement events, Supreme Court cases and legislative changes. His study embodied one small group of militarization research using historical analysis. Using similar techniques, for instance, Haggerty and Ericson (1999) found increased use of surveillance and

⁴ The term "intelligence" should harken to military intelligence-gathering, not "intelligent" as in well-learned or informed (not that intelligence-led policing is not well-learned or informed).

⁵ Short for COMPuTer STATistics.

⁶ It is no theoretical leap to note the association between militarization and intelligence-led policing. Since Sun Tzu, effective military strategy has always been coupled with intelligence gathering.

other support technology in police departments.⁷ The other small body of research on militarization used quantitative analysis drawn from surveys to describe militarization. As mentioned before, Kraska found evidence of a trend toward militarization between 1980 and 1995 (Kraska 1996, 2007; Kraska and Cubellis 1997; Kraska and Kappeler 1997), using a one-time survey of a set of departments (mentioned above) and an ethnography with a single department. Also, a recent survey from the ACLU (2014) catalogued SWAT activities and found a large increase in equipment purchases and SWAT usage overall across 260 American departments.⁸

What is lacking is a systematic analysis of the national trend of militarization. We do not have a clear understanding of its regional extent, or what affects its growth. We do not know how it is associated with basic agency-level information, such as the number and racial make-up of its officers. This paper begins that effort.

I track department-level organizational characteristics, characteristics that embody police militarization, over an eighteen-year period, from 1990 to 2007. I track militarization using two techniques. First, I combine a series of theoretically informed indicators to construct an index of police militarization. Using hierarchical linear regression modeling, I describe the process of militarization over the period, and offer a nationally representative model of police militarization. Second, I decompose the index into its indicators, and compare the final model across indicators. This second analysis unpacks the complexity of police militarization in greater detail, and better informs the general trend that the index initially provides. Jointly, this analysis establishes an empirical foundation for a deeper analysis of American police militarization.

Research Questions and Hypotheses

1. *What is the extent of militarization in the United States?* Here, I am posing two basic hypotheses: one for growth, and another for absolute militarization.
 - a. In real terms, the growth within a department is represented by the average increase in the amount of equipment per officer, in how often that equipment is used (both in PPUS and beyond), and in the degree of the department's focus on military-style policing.
 - i. *Departments will have militarized over the eighteen-year period, in that their scores in 2007 will be, on average, higher than their scores in 1990.*
 - b. The second hypothesis characterizes absolute militarization: are departments

⁷ If we broaden our empirical lens beyond the US we see a few more studies tracking similar trends: McCulloch (2001) found a similar trend in Australia, and others have noted increased reliance on surveillance and militarized tactics in the United Kingdom (see for instance, McGarrell et al. 2007; Sindall and Sturgis 2013)

⁸ Outside of the realm of militarization specifically, others have noted changes in policing strategies akin to militarization. For instance, researchers have noted changes in the way police officers approach social protest (King 2013; Marx 1970; Vitale 2005). Citing the Battle in Seattle (1999) and the Occupy Wall Street protests (2013), Gillham and Noakes (2007) noted a recent shift away from negotiated management. Characterized by technological restriction and bureaucratic control, their "strategic incapacitation" seems to be a direct extension of intelligence-led policing (see also della Porta and Tarrow 2011). (Dunn 2001) suggested similar trends in border patrol activities, where local police have become empowered to routinely check for residential status over fears of drug trafficking. Other events in 2014 and 2015 have highlighted the connection between militarization and policing of impoverished, black neighborhoods. Both the policing response to the protests following the shooting of Michael Brown in Ferguson, MO (Oliver 2014) and the protests and riots following the death of Freddie Gray in Baltimore, MD (Stolberg 2015) were marked by the tenets of militarism.

- militarized in general, in terms of having high militarization scores? This hypothesis is a bit arbitrary, as explained later; the index I constructed is best as a comparative measure rather than an absolute one. Even so, I expect most departments to be considered as “above average”, based on the scale and indicators.
- i. *Militarization scores in 2007 will, overall, be high, on the relative scale of the index (and indicators).*
2. How is militarization patterned across the United States? As the history of policing is ruled by regional variation (Wadman and Allison 2004), it seems reasonable that the scale or character of militarization would also vary. I assume two basic patterns:
- a. Tenets of militarization variously apply to the history of regional variation across the US. Southern departments pioneered patrols (infamously with slave patrols), Western departments were the birthplace of modern SWAT teams, and early Northwestern departments were influenced by cronyism. Given the wide variation, it is not clear how absolute militarization will vary; but differences are surely likely.
 - i. *Militarization will vary in content across regions, but that variation is not readily clear.*
 - b. The majority of the US population lives in cities, and the majority of policing occurs in municipalities. Tough-on-crime policies tend to disproportionately affect minority populations (Alexander 2012; Pettit and Western 2004; Sampson and Lauritsen 1997; Tonry 1994; Western and Pettit 2005), whom are disproportionately located in cities. Violent crime and arrest rates tend to be higher in cities as well (National Center for Victims of Crime 2013). All prior evidence suggests that militarization will be higher in municipal departments.
 - i. *Militarization will be higher in municipal departments than in sheriff's.*
 - c. While differentiating between municipal and sheriff's departments captures part of the difference inherent in cities, factors associated with size will more directly capture it. Therefore, I include another set of variables to track size, and reasonably believe that size will be positively associated with militarization.
 - i. *Militarization will be higher in large departments, as measured by size of serving population, number of sworn officers or budget.*
3. Aside from control variables, what initial associations influence militarization? I consider three sets of questions, which may have an impact on militarization, but are not simply controls for common differences across departments.
- a. Prior researchers have tracked various effects of gender of officers. For instance, Miller (1999) draws direct connections between a department recruiting women early and modern community policing techniques, and Dodge et al. (2010) showed SWAT teams were veritable havens of masculinity. Perhaps there is a similar association with militarization as well.
 - i. *As the ratio of men-to-women officers increases, militarization increases.*
 - b. Similar to the impact of gender, departments characterized as more diverse, especially in regards to historically impacted racial groups, may have an impact on degree of militarization. Sklansky (2006) provides a convenient review, suggesting some differences in policing outcomes across racially diverse departments.
 - i. *As the ratio of white-to-black officers increases, militarization increases.*

- c. Requiring a certain degree of education or a certain amount of training may signal different kinds of strategic positions in departments; thus, it likely influences militarization. However, the direction of the relationship is not theoretically clear, and prior evidence does not provide clues. The wave of professionalization prior to the wave of militarization studied here demanded a formalized streamlining of police conduct, itself requiring a greater degree of training, at minimum. This would suggest a positive association between education and militarization, as it followed professionalization. However, the procurement of equipment and strategies supporting militarization has not been found to be directly linked to greater education or training across. It is a separate process supported simplistically by grant application or military surplus availability; training and prior education is encouraged, but not necessarily required. Thus, perhaps there is no relationship, or even a negative association.
 - i. *Educational requirements and on-the-job training will have an effect on militarization, though the direction is not clear.*

Methods: Data

Law Enforcement Management and Administrative Statistics

I derived most policing data, including militarization measures, from the periodic Law Enforcement Management and Administrative Statistics dataset (Bureau of Justice Statistics 1987). The Bureau of Justice Statistics collects a representative sample of American police departments every three to four years, beginning in 1987. The ninth wave was collected in 2013 but was publicly released too late to be included in this project. When surveyed, departments are asked a range of questions about their operations, expenditures, organizational structure, and equipment. The sampling frame of departments comes from the Directory of Law Enforcement Agencies, which is itself a fairly exhaustive list of major police departments across the country (Office of Justice Programs. Bureau of Justice Statistics. 1986). Each wave of LEMAS includes every state agency, every department with 100 or more officers⁹, and a random sample (different in each wave) of 1,000-2,000 smaller agencies. Each wave had over 2,500 departments reporting, with 496 state or other departments of 100 or more officers reporting in all eight waves.

Within most waves, the surveyors assigned a unique ID to each department; I coupled that information with other data (name, location, department type and Originating Agency Identifier (ORI)) to transform the disparate cross-sections into one longitudinal dataset. Thus, the unit of observation for militarization in this dataset is the department (sometimes referred to as an agency); I cannot differentiate between stations within departments (for example, a New York police station in Manhattan would be considered in the same department as a station in the Bronx), but I can differentiate between departments in the same county or metropolitan area (for instance, I can differentiate the Chicago Police Department from the Cook County Sheriff's Department). The ORI allows agencies to be merged with other Bureau of Justice Statistics (BJS) data on crime and arrests. Geographic information (county, zip code, congressional district) allows for further matching of other datasets, most notably the US Census.

Different questions were asked in each survey wave, so as the data is, comparisons between places within waves are more accurately assessed than changes over time. Of course,

⁹ In 1987, they only included departments with 135 or more officers.

analysis over time is a major goal of this paper; thus, special attention had to be paid to the problem of creating measures that can accurately assess change across time. Some changes are minor, others are major; for instance, a full section on drug enforcement was introduced in 1990, an expanded section on community policing in 1993, and a section on anti-terrorism policing in 2003. I carefully tracked these changes when transforming these cross-sectional surveys into a longitudinal dataset. A question was considered to be the same across waves only if (1) the questions were identical and (2) the requested responses for those questions were nearly identical.¹⁰ Questions that did not match these criteria were treated as new items, beginning in the oldest wave of that question. Nonresponse was treated as missing. In some cases, longitudinal measures could be created by collapsing categories. For instance, in 1997, departments were asked only whether or not they had an armored vehicle, while in 1990 and 1993, they were asked only *how many* armored vehicles they had; thus the longitudinal variable captures only the presence or absence of armored vehicles.¹¹ I describe each indicator used in the militarization index (now, referred to as just “indicators”) and all variables of interest below; I provide a lengthier description of indicators in Appendix A, including necessary recoding and operationalization procedures.¹²

CrossWalk

CrossWalk (Bureau of Justice Statistics 2012) is a supplementary dataset meant to facilitate merging of various datasets with LEMAS and other policing data. Its observations are police agencies, just like LEMAS. It includes data on police agencies, as well as an expanded set of geographic identifiers, including Census associations, an expanded set of police identification information, and political regions. Crosswalk is updated roughly every ten years, with the latest update run in 2012 – updated, in the sense that departments change somewhat year to year; some departments are closed, departments move, congressional districts change, etc. Here, I use the 2012 CrossWalk dataset. It is not used for any analyses; rather, I only use it to facilitate merging of other data.

Uniform Crime Reports

The Federal Bureau of Investigation (FBI) collects offenses against officers, crime estimates and arrest records from police departments annually (Federal Bureau of Investigation 1980, 1989). Importantly here, it gives geographic information for which I use as theoretical controls. Information in the dataset is collected by agencies, and using CrossWalk, data was easily matched with LEMAS.

¹⁰ Near, because I considered questions that gave binary choices (yes or no) to be identical to questions with binary plus a “no answer” style checkbox. In the former, agencies did not answer “yes” or “no” to signal “no answer”, while they checked a box for it if it was included.

¹¹ In other cases, this generation of new variables was more complex; but again, this was based on generating more general variables for the purpose of longitudinal analysis. For instance, surveyors slightly varied the manner in which they inquired about body armor. Depending on the wave, agencies were asked: If they (1) had body armor; whether or not it was (2) authorized, (3) supplied, (4) either, or (5) both; whether or not they required their (6) patrol officers, (7) special operations officers, (8) both or (9) either to wear it; and finally, whether or not they required them to wear it (10) all the time, (11) sometimes, or (12) never. Only waves 1990 and 1993 asked all of these questions with perfect specificity, while wave 2007 only asked (6) and (10-12).

¹² Request for more specific description of data transformation across the entire dataset will be honored upon request.

Methods: Sample

After merging, there are 10,308 departments with 24,222 total observations. Across the eighteen-year period, departments responded from one to eight times. Table 1 shows the total number of departments reporting across all waves. Response rates were fairly high across all waves, ranging from 90.6% to 97.4%; thus, I assume that nonresponse is not a significant source of bias in the sample.

The analytic sample drops all departments tagged as constables, special, tribal, school or university police; these types of agencies either did not participate in regular patrol duties (constables and special), or were rarely sampled enough to allow for variation within these types (tribal, school and university) ($n = 1,297$ observations, 5.35% of the data). I dropped waves 1987 and 1999 because they lacked adequate information for the militarization index ($n = 5,804$, 25.29% of the remaining data). I dropped any agency that was sampled only once ($n = 4,236$, 24.70% of the remaining data) or that could not be matched by ORI or other information ($n = 236$, 1.83% of the remaining data). After drops, the final dataset included 4,104 departments, with 12,677 observations across waves.

Methods: Measuring militarization

The concept of militarization

As outlined by Kraska and Kappeler (1997), militarization is a process of change across four dimensions. To simplistically review, these are changes in equipment, paramilitary tactics, policing strategy, and culture. In developing the index, hereafter the LEMAS Militarization Index (LMI), I made two assumptions. First, there is a difference between a department that is militarized and a department that is militarizing. A *militarized* department would have a stockpile of military equipment, an active paramilitary policing unit, a policing strategy that emphasizes intelligence gathering and directed patrol, and a normative culture akin to a battalion. A *militarizing* department is one that is taking steps to become a *militarized* department: for instance, it is actively seeking high-powered weapons and perhaps an armored car. An analogy can be drawn between militarization and development; there is an intrinsic difference between a militarizing and a militarized department, just as there is a difference between a developing and a developed country. As such, militarization can only be understood over time, and that change over time must be analytically separated from comparative militarization across departments. As a second assumption, there is no compelling reason to believe that any single dimension is more important for militarization than any other, and frankly, that any of these dimensions are mutually exclusive from each other. Therefore, I construct the LMI as a combination of direct measures of militarization without distinguishing between the four dimensions. Unfortunately, LEMAS has no information that can measure the cultural dimension, so I only measured the first three dimensions.

Table 2 outlines descriptive statistics for each indicator included within the LMI. I only included indicators that were meaningfully complete across at least two waves and were asked of all departments, regardless of type or size. As stated before, the index is empirically and theoretically informed from prior analyses of militarization. In that sense, its design is only as strong as the findings of prior work; at the same time, there is little contention in this literature

Table 1: LEMAS Sample Breakdown

Year	Response Rate	Σ Before Drops	Σ Drops	Σ large and state agencies	Σ other agencies	Σ after drops
1987	95.2%	2,907	2,907	0	0	0
1990	94.5%	2,945	1,356	633	956	1,589
1993	93%	3,028	1,370	713	945	1,658
1997	--*	3,412	581	781	2,050	2,831
1999	--*	3,246	3,246	0	0	0
2000	97.4%	2,985	102	860	2,023	2,883
2003	90.6%	2,859	986	879	994	1,873
2007	91.8%	2,840	997	820	1,023	1,843
Total Depts		10,308	6,204	928	3,176	4,104
Total Obs		24,222	11,545	4,686	7,991	12,677

*Response rate not given

Table 2: Description of Militarization Measures across ALL years

Dimension	Sub-Dimension	Variable	Type	Mean or Proportion	StDev
Stock	Stock	Unmarked/Marked Cars	Continuous	0.5398	0.3809
Stock	Stock	Dogs/100 officers*	Continuous	0.0256	0.0664
Stock	Lethal	Semi power-index	Categorical	1.910	0.7772
Stock	Nonlethal	Chemical	Binomial	86.18%	
Stock	Nonlethal	Electrical	Binomial	26.06%	
Stock	Nonlethal	Impact (Projectile)	Binomial	24.14%	
Use	SWAT	Has a SWAT team	Binomial	50.54%	
Use	PPU Use	Does drug enforcement	Binomial	90.78%	
Use	PPU Use	DTF/Non-DTF †	Continuous	0.0378	0.1452
Use	Equip Use	Use of non-lethal force	Binomial	93.06%	
Strategy	Surveillance	Has cameras	Binomial	63.52%	
Strategy	Surveillance	Cameras/100 officers*	Continuous	0.2106	0.2974
Strategy	Reactive	Non-comm off/all officers	Continuous	0.8655	0.2718
Strategy	Danger	Body armor req. for patrol	Binomial	44.86%	

* Per 100 officer only for tables, to facilitate interpretation

† Drug Task Force Officers/ (All Officers – Drug Task Force Officers)

on the content of militarization itself.¹³ As such, I pulled indicators that corresponded to each of the three major dimensions of militarization as outlined above: militarized equipment, its use through paramilitary policing units or otherwise, and a strategy that supports it. As stated before, these indicators were not mathematically constructed as being dimension-specific; each indicator independently adds to the final militarization index. To be clear, many indicators were not asked in every wave; I outline how I accounted for variation in periodic inclusion of indicators in the next section.

The index is composed of fourteen indicators.¹⁴ First, the LEMAS survey includes a fairly extensive section on equipment. I used four indicators to track escalation of equipment: a scale based on the maximum allowed caliber of side-arm and the range of those allowed side-arms, and three dummies to separately track whether departments allowed chemical, electrical or projectile-based non-lethal weapons. More important than type of equipment is quantity; however, surveyors asked about the quantity of only a small fraction of equipment. More commonly, they asked whether or not they had a particular piece of equipment at all. Thus, I used other variables as proxies of equipment stockpile: the ratio between unmarked and marked cars (capturing vehicular stock) and number of dogs per officer (capturing offensive equipment stock).

The second dimension captures a department's use of militarized equipment. This is commonly in the form of a paramilitary policing unit (PPU), which in the index, was tracked with a dummy variable. Use, of course, is the most important component of this dimension. For non-violent weapons use, I included a dummy tracking the presence of a policy on non-lethal weapons use. Unfortunately, there were no direct measures of PPU usage. Therefore, I used prior empirical findings to suggest a reasonable proxy for paramilitary policing use: extent of drug enforcement. In every prior empirical account (ACLU 2014; Balko 2013; Kraska and Kappeler 1997), a strong link has been described between SWAT team usage and drug enforcement. Therefore, I used two variables to track a department's focus on drug enforcement: a dummy tracking whether or not the department participates in drug enforcement, and the ratio of officers serving on a drug task force to all other officers.

Finally, the LMI captures the strategic focus of militarization, mostly as a function of military-style and intelligence-led policing. Most important to this strategy is technology supporting surveillance; to capture this, I used both a simple dummy tracking whether or not departments used cameras, and the ratio of cameras per officer.¹⁵ To capture the focus on

¹³ The only real sources of contention with militarization come from when it began exactly, and the extent to which it is complimentary or counter to community policing. The former is irrelevant for the index, but the latter is. Prevailing evidence suggests that the presence of community police may or may not be relevant to militarization, but its absence is surely related to higher militarization levels, at least from a strategic position (Dabney 2010; Darroch and Mazerolle 2013; Magers 2004; McGarrell et al. 2007). Therefore, I include an indicator that tracks the number of community officers, to capture the focus on community policing (to be explained below).

¹⁴ In Appendix A, I provide a deeper rationalization of each indicator used in the index, and give longitudinal summary statistics for every variable in Appendix D.

¹⁵ Of course, this strategy is supported by an increased reliance on computing technology to facilitate rapid information analysis. However, consistent with technological history, changes in the survey structure around computer technology and its use were fairly dramatic from wave to wave; thus, measures of computer technology were too volatile to be used within the LMI. For instance, the survey in 1987 differentiated between mainframe and minicomputers, each of which were much larger than and very out-of-date compared to what we see today. Just three years later, the next wave in 1990 was expanded, and included categories for laptop computers and digital terminals were added. The third wave in 1993 had sections on how files were used and for what policing activities, and unsurprisingly, dropped the mainframe and minicomputer distinctions. Changes were ongoing and frequent.

aggressive patrol, I use the proportion of officers *not* trained in community policing relative to all officers. To capture the normative strategic focus on neutralizing dangerous offenders, I use a dummy to track if patrol officers are required to wear body armor. Recent waves introduced a host of new indicators to more directly capture the intelligence-gathering aspect of this dimension. Unfortunately, these were asked too late, so are poor indicators from which to analyze militarization over time.

Creating the Index

From these variables, I constructed two measures of militarization: an absolute measure (ALMI) and a standardized measure (SLMI). The former is better for longitudinal analysis, while it is more sensitive to measurement changes from wave to wave. The latter is the reverse; it is poor for longitudinal analysis, but is more resistant to measurement changes wave to wave. The analyses in this paper are based on ALMI (sometimes referred to simply as “the index”); SLMI is only used to test weaknesses in ALMI. To facilitate explanation of each, I use construction of the index for the New York Police Department (NYPD) in 2000 as an example.

Absolute LEMAS Militarization Index (ALMI)

In this iteration, I first added absolute values of each measure, all of which ranged from 0 to 1.5.¹⁶ Then, I divide each summation by the total number of possible measures within each year; these were specific to year. Finally, I multiply that value by 100, to get an index that ranges from 0 to 100. As outlined in Table 3, the 2000 NYPD had an ALMI of 61.69.

ALMI allows for tracking of militarization over time, since it is based on the absolute values of the various indicators. However, because the utilized indicators changed slightly year-to-year (outlined in Appendix A), this index is subject to three problems. First, changes from year to year may be an artifact of whether or not indicators were included in particular waves. To minimize this problem, I used three strategies. First, I limited the scale of all indicators to be between 0 and 1.5; thus every indicator influences the overall index relatively equally, in terms of their added value. As a second related strategy, I did not independently weight indicators relative to their *independent* theoretical importance. Finally, I created five alternate versions of the index that excluded indicators that were added to or dropped out of the dataset for each wave after 1990. For instance, one of the five alternate versions tests the impact of three new indicators being introduced in 1993; that calculated ALMI excludes the indicators for operating drug enforcement, ratio of dogs and allowing projectile impact weapons.

As a second major problem, without individual weighting, I cannot attribute theoretical importance to unique indicators. Thus, an indicator like the presence of SWAT is just as important as a department having a non-lethal weapons policy. I minimized the impact of this bias by using only 1-2 indicators to capture each sub-part of the index; thus any one theoretical dimension does not overwhelm the effect of other dimensions (or indicators).

Finally, this index allows binomial indicators to more drastically affect the final ALMI than do continuous indicators, in general. To account for this artifact-based weighting, I included binomial indicators for just one construct that often had continuous values that were quite small: cameras. Another strategy would have been to transform the values based on means of the overall distribution; for instance, I may have created a binomial indicator for continuous

¹⁶ Ratios exceeded one very rarely. In these cases, rather than lose the explanatory power of departments which had large stockpiles of equipment, for instance, I capped these ratios at 1.5. Thus, in these cases, they may contribute more for that indicator than for others. But it does not cause the indicator to massively sway the index, in these rare cases.

Table 3: Absolute LEMAS Militarization Index Example: NYPD Cameras per officer in 2000

Step	Action	Operation	Example
1	Identify variable	X	.0298009
2	Add all values within year	By year: $x+y+z+\dots=M$	8.0195*
3	Calculate number of indicators present in that year	Q	13
4	Divide summation by questions in that year	$M/Q = P$	0.6169
7	Multiply by 100	$P*100$	61.69

*This step adds ALL values within that dimension, not just marked cars per officer

variables as 1 if the department was in the top 50% of all departments for that wave. However, this would transform that indicator into a rank-based variable, which would cause misleading longitudinal conclusions.¹⁷

As a final note, interpretation of specific ALMI values is essentially arbitrary; it is most useful as a comparative indicator, either across waves within departments or between departments within waves. For convenience, I use the same shorthand interpretation used when considering the strength of Pearson correlation coefficients: 0-20: not militarized; 20 - 40: minimally militarized; 40 - 60: fairly militarized; 60 - 80: very militarized; 80 – 100: extremely militarized.

Standardized LEMAS Militarization Index (SLMI)

In this iteration, I focused on the weaknesses of ALMI: the unevenness of the included measures over the entire period, the lack of individual indicator theoretical weighting, and the influence of binomial indicators relative to continuous. This index is based on the relative rank of militarization for each department within each year based on a z-score distribution. As with ALMI, Table 4 outlines the steps taken to create this measure, beginning with cameras per officer.

First, I standardized each indicator within each year. Next, I added all standardized values together within each year. Finally, to account for differences in the number of measured variables year by year, I standardized those total values again within each year. The end result is an index based on the same distribution for every year that, within each year, describes the relative ranking of militarization for each responding agency. The 2000 NYPD had an SLMI of -0.64; using a standard normal distribution, they were in the bottom 45% of departments in that year, in terms of their degree of militarization.

This measure suffers from a different set of problems than does ALMI. Most importantly, I cannot track absolute changes in militarization over time, both within departments and in general. SLMI tracks changes in the relative ranking of militarized departments over time; thus the most militarized department in any given year receives the highest value, and the least militarized receives the lowest. Thus over time, I can only track if the most and least militarized departments *change their rank* year-to-year. The relationships with other explanatory variables over the period, as a result, become conceptually muddled and difficult to intuitively interpret.

Another problem is that the process of creating SLMI fixes the mean and standard deviation of every indicator to be the same. This means that variation between departments is fixed for every indicator, thus each loses its unique contribution to the overall construct of militarization. Thus I cannot make claims of the size of the difference between departments beyond standardized z-score distances. Taken together, I do not use this index in the longitudinal analysis. Instead, I use it only to test the weaknesses of ALMI's volatility year-to-year. In other words, I assume that if both indices are highly correlated over time, then the volatility weakness

¹⁷ The indicator for sidearm power is a version of this, but it is a step more complex as to capture two parts of power that are relevant to militarization. As explained in Appendix A, sidearm power was calculated as a combination of two factors: having a high or low range of allowed sidearm gauges, and a high or low maximum allowed sidearm. "High" and "Low" was based on being at or above the average for that wave, or lower, respectively. Those with a low maximum sidearm and high range were given values of 0, low maximum and low range a value of 1, high maximum and high range a value of 2, and high maximum and low range a value of 3. This indicator was designed to capture a unique scenario which is heavily based on technological change. Also, the metric is intrinsically comparative: norms of side arms across departments are assumed to affect each other, which an ordinal metric is meant to measure.

Table 4: Standardized LEMAS Militarization Index Example: NYPD Cameras per officer in 2000

Step	Action	Operation	Example
1	Identify variable	X	0.0298009
1.5	If rate, take log	$\log(x)$	-3.513216
2	Standardize variable within year	By year: $(x - \bar{x}) / \text{sd}(x)$	-0.9219196
3	Add all standardized values within year	By year: $x + y + z + \dots = M$	-0.4811203*
4	Standardize final value by year	By year: $(M - \bar{M}) / \text{sd}(M)$	-0.1228065

*This step adds ALL standardized values, not just cameras per officer

of ALMI is minimal relative to what it is intended to measure.¹⁸

Assessing the complexity of police militarization

Confirmatory Factor Analysis and Cronbach's Alpha

Analysis of ALMI established an unavoidable truth: factors empirically associated with militarization do not simplistically co-vary. An analysis using Cronbach's Alpha and a Confirmatory Factor Analysis (CFA) provide the most straightforward illustration of this reality. These analyses assess the effect of each indicator on the overall ALMI, as well as on each other. For Cronbach's Alpha, an analysis uncovers the degree to which all indicators co-vary, reporting values ranging from 0 (no covariation) to 1 (complete covariation). The analysis also provides an overview of how the Alpha value changes if indicators are removed from the calculation. The CFA captures a bit more; if subsets of indicators vary with each other, then there is evidence that they relate to some unspecified dimension; or in CFA terms, they relate to an associated latent variable. To isolate the effect of time, I isolated each analysis within each year. Appendix B summarizes these results in more detail, including a correlation matrix of indicators.

Year-to-year, Cronbach's Alpha values ranged from as low as 0.19 in 1993 to as high as 0.42 in 2003. The CFA produced similarly poor variation results, and found that the presence of SWAT and the nonviolent weapons indicators were major contributors, and so to the index itself. Thus the CFA demonstrates that the index is imperfect in its design, at best; but while weak mathematically, it provides a simple means of analyzing militarization that should not be discarded. But to recognize and incorporate the mathematical realities of the index, I carry out the analysis in two steps: first, I use ALMI for model comparison tests, to capture the general trend of militarization; then, using the best model, I describe the unique impact of control and explanatory variables on each individual indicator. Thus, I start broadly, and come back to provide a nuanced explanation.

Why not discard the index altogether? ALMI provides a convenient means of assessing a complex construct, which in turn allows for more nuanced statistical modeling. Put another way, ALMI captures what is true of organizational change under the framework of militarization: departments militarized in different ways. A department that has a large fleet of unmarked cars, for example, may not also have a SWAT team, and vice versa. But, as an integral assumption for the index, a department that shows high values in ALL indicators is more militarized than a department that only shows high values in a few. Since indicators had similar scales and each indicator contributed in size equally to the overall measure, uneven contributions to the index from indicators are related to empirical differences rather than metric-based differences. Thus, when all indicators increase together in a given department, the index asserts (and by association I assert) that that department is highly militarized.

Content and criterion validity: A brief content analysis

If ALMI provides similar results as another empirical test of militarization, there is greater evidence that ALMI is a valid measure for militarization. Unfortunately, the data used for the other two empirical tests of militarization of this kind (performed by Kraska and Kappeler (1997) and the ACLU (2014)) were unavailable for comparison. In its place, I perform a content analysis of a subset of departments.

Based on the mean between the average ALMI score over the eighteen-year period plus

¹⁸ This iteration also serves as a de-trended variation of militarization. This allows analysis of a pooled sample across all observations that removes the potential change over time. However, I do not do that analysis here.

their score in 2007, I ranked every department. I created a sample of twenty random departments; five came from the top twenty, five came from the bottom twenty, and ten were randomly drawn from the thousands in between. This analysis included two elements: first, a news search of policing activities of the department between 1990 and 2007; second, a brief overview of the department itself, based on available public information (especially its website and its related use of social media). The conceptualization of militarization was very similar to the conceptualization used in this paper; the operationalization, however, was more direct, based on observable characteristics of the department itself. Appendix C describes the content analysis in more detail, including the its formalized protocol. To minimize bias I would have introduced into the content analysis, I had a research assistant perform it using a scrambled list of the twenty ranked departments; this assured that results were double-blind.

In consultation with myself, the research assistant created a ranking system based on a Likert-type scale of one to five. Departments were given scores of five if they were observably “very militarized,” one if “very little evidence of militarization.” When finished, I compared the ranking of departments gathered from the content analysis to the ranking established by ALMI; if departments with high ALMI scores were also highly militarized according to the content analysis (and vice versa), then the mathematical weaknesses of the index uncovered by the CFA and Cronbach’s Alpha may be meaningfully minimal. However, as Table 5 and 6 show, the content analysis provided only moderate support for the index. Departments roughly matched across ranking procedures, with nine matching or nearly matching the relative level of militarization, and five weakly or poorly matching. Six departments lacked adequate information for a content analysis to be completed; these ranged across the initial list of ALMI rankings. To preserve random sampling, additional departments to replace these missing departments were not sampled.

The largest deviation between the index and the content analysis was on the higher end of militarization: of the top four most militarized departments by ALMI, three received fairly different scores through the content analysis. This suggests that ALMI is a better measure for the “average” and “less militarized” departments than it is for the extremely militarized departments. Of course, since this analysis is based on a random sample of departments, most departments will fall into the statistically “average.” More importantly, the content analysis provided further evidence that militarization looks different across departments. Some departments emphasized a strategy based on surveillance and aggressive control, but did not have an active SWAT team; others had an active SWAT team but the strategy was more varied. Thus a two-tiered analysis of militarization is further necessitated.

Correlation with other versions of the index

Finally, I assess the volatility problems of the ALMI as mentioned above by assessing the correlation between ALMI and the other versions of the index. First, I compared ALMI with the standardized LMI or SLMI. They both measure militarization using the same indicators, but suffer from opposing problems; thus if they are highly correlated, the extent of those problems are likely minimal. I find that these measures are highly correlated, with a pooled Pearson correlation coefficient of 0.73.

Next, I correlated each of the five alternate ALMI’s that capture changes in indicators for every wave after 1990. These more directly assess wave-to-wave changes that may be influencing the trend of militarization. Not only were these alternate versions of ALMI correlated highly with ALMI itself (all with $r > 0.90$), but they were also correlated highly with

Table 5: Comparison Ranking of ALMI and Content Analysis

Department	State	Sworn*	ALMI Score†	CA Score‡	Match
Woods County Sheriff's	OK	5	28.3	1	Good
Limestone County Sheriff's	AL	38	30.3	3	Weak
Morton County Sheriff's	KS	6	30.8	--	--
Longmeadow Police	MA	26	31.4	1	Good
Huntington Bay Police	NY	6	35.0	--	--
Shrewsbury Police	MA	46	35.2	1	Okay
Old Bridge Township Police	NJ	105	39.7	1	Okay
Myrtle Creek Police	OR	7	44.4	--	---
Kokomo Police	IN	103	51.2	2	Okay
Macon Police	GA	282	51.8	--	--
Oak Lawn Police	IL	104	52.6	2	Okay
Cedar Rapids Police	IA	188	54.7	5	Weak
Belleville Police	IL	83	56.2	4	Okay
Valencia County Sheriff's	NM	35	56.5	--	--
Rochester Police	NY	706	64.3	5	Okay
Washington County Sheriff's	UT	39	68.1	--	--
Manchester Police	IA	9	69.4	2	Poor
Santa Monica Police	CA	214	72.0	4	Okay
Morrisville Police	NC	25	72.6	2	Poor
Bellingham Police	WA	108	76.6	3	Weak

* Reported number of sworn officers in 2007.

† Average militarization score across all reported waves.

‡ Those without scores had too little information to assign an adequate value.

Table 6: Match Ranking of ALMI and Content Analysis

Department (ALMI Rank)	ALMI Score†	CA Score‡	Department (CA Ranking)
Woods County Sheriff's	28.3	1	Woods County Sheriff's
Limestone County Sheriff's	30.3	1	Longmeadow Police
Longmeadow Police	31.4	1	Shrewsbury Police
Shrewsbury Police	35.2	1	Old Bridge Township Police
Old Bridge Township Police	39.7	2	Kokomo Police
Kokomo Police	51.2	2	Oak Lawn Police
Oak Lawn Police	52.6	2	Manchester Police
Cedar Rapids Police	54.7	2	Morrisville Police
Belleville Police	56.2	3	Limestone County Sheriff's
Rochester Police	64.3	3	Bellingham Police
Manchester Police	69.4	4	Belleville Police
Santa Monica Police	72.0	4	Santa Monica Police
Morrisville Police	72.6	5	Cedar Rapids Police
Bellingham Police	76.6	5	Rochester Police

each other (the lowest correlation being between the 1997 variation and 2000 variation, at 0.79). All versions of ALMI showed a similar upward trend of militarization, to be explained below.

Importantly, these alternates test wave-to-wave “bumps;” they are best at testing the extent to which excluding particular indicators influences the specific change between waves. Three of the five wave-to-wave changes showed trajectories that were descriptively different from the main ALMI: comparing the main and alternate ALMI’s, the change from 1990 to 1993 and 2003 to 2007 went from slightly lower scores to slightly high scores, respectively; additionally, the change from 1993 to 1997 went from a large increase in average militarization scores to just a slight increase. Changes from 1997 to 2000 and 2000 to 2003 were nearly identical across indices. Taken together, these alternate indices signal an important caution: ALMI is best analyzed as a complete time trend, and should be analyzed with these alternate ALMIs if wave-specific trends are included.

Methods: Variables

Explanatory: Simultaneous correlates

A rich literature has tracked differences in policing across varied contexts of diversity, so it is reasonable to believe that these same factors can influence militarization.

Gender of officers

I measured gender of officers by taking the log ratio of women to men sworn officers. To account for the possibility that departments may have no women, I added 0.5 to each the totals for women and men. Values above zero mean a department employs more officers that are women than they do men; this never occurred.

Race of officers

I measure race of officers by taking the log ratio of black to white officers. Like gender, I accounted for the possibility that departments may have had no black officers by adding 0.5 to each the totals for black and white. I do not take the log ratio of white to all other officers, because I am primarily interested in the white-black dynamic of police/community relations. As mentioned before, prior research on race and policing has found that the starkest differences in criminal justice-related outcomes (of nearly all kinds) are found in the experiences of blacks. Like gender of officers, values above zero mean a department has more black than white officers; this never occurred. I also use a calculated interaction term between race and gender to capture potential intersectionality effects.

Required education and training of officers

Education and training capture the department's level of formal knowledge required before becoming a full officer. I use three variables to track education and training. First, LEMAS gathers data on educational requirements of its entry-level officers. This is a ranked categorical indicator, ranging from zero (no requirement) to four (college degree). I do not use years of education, because high school was the overwhelmingly common requirement for most departments. Thus the ordinal range allows for more comparable differences between requirements (2 for high school is half as much as 4 for a college degree, while 12 years of education is only a fourth less than 16 years). For the other two variables, LEMAS gathers data on the hours of training required for new officers. I took both the required hours training in the field and the hours required in a police academy. These are often gathered in chunks rather than as a true continuous range (for instance, 160 hours captured four weeks of training, 320 captured roughly two months, etc.); however, to transform into a categorical ranked variable would

misleadingly shrink the distances between requirements.

Control Variables

Control variables account for theoretically relevant associations that could influence the character of the militarization trend. Regional controls came from the UCR (Federal Bureau of Investigation 1989), while agency controls came from LEMAS (1987 -).

Region Controls

Geographical Region:

Variation in policing styles across national regions has been noted in historical and modern research (Wadman and Allison 2004). In other words, police in New York and Los Angeles, both in large MSA cities, may differ in how they police. Therefore, I use simple Census distinctions to approximate national regional differences: South, Northeast, West and Midwest.

City

A dummy variable indicates whether or not the agency is located within a micro- or metropolitan service area (MSA) city, as indicated by the Census. This is mainly used to distinguish between rural and urban departments.

Agency Controls

Type of department

After dropping departments for lack of direct law enforcement or for lack of number of departments within particular categories, I distinguish between state, sheriff and municipal law enforcement. Each of these types are subject to varying circumstances, including their jurisdictions, whom they report to and the kinds of crimes they are typically responsible for enforcing. Simple dummy variables track type of agency.

Budget

A department's ability to purchase new equipment is logically related to its ability to purchase militarized equipment. Budget also captures the size of department. I divide the budget by 1,000 to make effect sizes more meaningful, and use 2007 constant dollars to account for inflation over the eighteen-year period.

Number of officers

Agencies reported their total number of sworn officers in each wave. I do not use total number of staff (sworn and non-sworn personnel), because I am interested in associating the law enforcement component of the agency to militarization; adding the administrative component would inflate these values past their theoretical meaning.

Serving population

While linked to geography, serving population is more tightly related to size of an agency; it acts as the external analogue to the internal measure of agency size captured by number of officers. Also, it expands on the city control, by differentiating between small and large cities. Thus small cities like Fond du Lac, WI are not made statistically equivalent to large cities like Chicago, IL.

General Model Construction

To identify the longitudinal panel trend of militarization over the eighteen-year period, I constructed a mixed effects growth model for militarization. Singer and Willett (2003) and others (for instance Snijders and Bosker, 2011) have shown the strength of mixed effects models for

measuring change in panel data. These models allow for time unstructured datasets¹⁹ such as this, and clearly distinguish between correlates of the de-trended militarization effect from the correlates of militarization growth. Also, this model shows the extent of variation in growth and militarization leftover both between agencies, and within agencies, and shows if departments with high initial militarization indices grew at different rates than those with lower initial levels. Taken together, this kind of model was the most appropriate to analyze longitudinal change over the period.

This mixed-effects model has two levels: (1) waves and (2) department. The initial proposed model is given in Figure 2; it includes only basic controls. While this is the most complete form of the model based on the variability of the data, allowing five random effects drives the degrees of freedom up significantly (especially when level 2 controls are included). Practically speaking, I would need to increase the size of my sample significantly to accurately estimate independent effects for every random effect. Therefore, I only allow growth to randomly vary. This results in the model given in Figure 3. This model allows every department to have its own estimated initial militarization rate, and its own militarization growth rate. More importantly, it separates the growth of militarization from the independent effects of its controls.

After model selection, I use the model with the greatest fit based on Bayesian Information Criterion scores²⁰ to describe each indicator within ALMI. I use BIC, because I want to more strictly scrutinize the number of explanatory and control variables being used, especially because of the flawed nature of ALMI. I run the best model of ALMI sequentially using each indicator as the outcome variable; thus, I describe the effects of each indicator in turn. I use logit regression for categorical outcomes. When explaining results, I give major trends of these indicators below, and provide more nuanced explanations in Appendix D.

Results

Sample Description

Table 7 describes basic univariate statistics for each explanatory variable, as well as ALMI. Categorical variables are reported as proportion “yes.”

Department-time observations were fairly evenly distributed across all four national regions: from South : Northeast : West : Midwest, departments were proportioned as 37:19:16:28. In other words, there were over twice as many Southern departments across the pooled sample as there were Western. Approximately 60% of agencies were located in Census-designated cities. The distribution of serving populations was skewed right such that most agencies had around 40k residents (median = 36,000), and a smaller number of departments served very large areas (mean = 195,407). Serving populations in general increased over time, though there was variation across departments. Departments themselves were generally small, with many departments employing fewer than 100 officers (median = 52); like serving population, departments were skewed right towards larger departments (mean = 198.9).

¹⁹ Datasets that have observations (here agencies) that have different number of waves, or observations with different periods of measurement, both of which describe this dataset. In other words, I can include a department that was measured three times, in 1990, 1997 and 2003, and another department that was measured four times, in 1993, 2000, 2003 and 2007, without biasing my model. For clarity, I analyzed the same final model for just agencies that responded in every wave; the results of that model are presented in Appendix E.

²⁰ I also consider Deviation and Akaike Information Criterion scores. But when scores give conflicting results, I fall back on BIC.

Figure 2: Proposed Model Describing Militarization, Full Random Effects¹

LEVEL 1

$$Y_{ij} = \beta_{0i} + \beta_{1i}(TIME) + \beta_{2i}(SERVING) + \beta_{3i}(SWORN) + \beta_{4i}(BUDGET) + \varepsilon_{ij}$$

LEVEL 2

$$\begin{aligned} \beta_{ki} = & \gamma_{k0} + \gamma_{k1}(SHERIFF) + \gamma_{k2}(CITY) + \gamma_{k3}(WEST) + \gamma_{k4}(SOUTH) \\ & + \gamma_{k5}(NORTHEAST) + \varphi_{ki} \end{aligned}$$

¹ At Level 2, multi-categorical reference variables “agency type” and “geographical region” are municipal and Midwest, respectively.

Figure 3: Proposed Model, Only Allowing Growth to Randomly Vary

LEVEL 1

$$Y_{ij} = \beta_{0i} + \beta_{1i}(TIME) + \varepsilon_{ij}$$

LEVEL 2

$$\begin{aligned}\beta_{ki} = & \gamma_{k0} + \gamma_{k1}(SHERIFF) + \gamma_{k2}(URBAN) + \gamma_{k3}(WEST) + \gamma_{k4}(SOUTH) \\ & + \gamma_{k5}(NORTHEAST) + \gamma_{k6}(SERVING) + \gamma_{k7}(SWORN) + \gamma_{k8}(BUDGET) \\ & + \varphi_{ki}\end{aligned}$$

DRAFT

Table 7: Descriptive Statistics of Explanatory and Control Variables

	1990 <i>n</i> = 1,433	1993 <i>n</i> = 1,498	1997 <i>n</i> = 2,674	2000 <i>n</i> = 2,732	2003 <i>n</i> = 1,798	2007 <i>n</i> = 1,747	Total <i>n</i> = 11,882
Region							
- Midwest	28%	27%	29%	28%	27%	26%	28%
- Northeast	19%	20%	20%	20%	19%	18%	20%
- West	17%	16%	16%	15%	17%	17%	16%
- South	37%	38%	36%	37%	38%	39%	37%
In a city	61%	60%	67%	67%	66%	64%	65%
Department Type							
- Municipal	60%	58%	67%	67%	65%	64%	64%
- Sheriff	40%	42%	33%	33%	35%	36%	36%
Sworn Officers	196.97	204.58	143.14	154.29	211.97	208.62	179.98
- Median	48	63	33	37.5	85	74	49
- (Standard deviation)	(886.56)	(913.31)	(879.46)	(907.44)	(611.79)	(1013.54)	(878.37)
Serving Population in thousands	144.5	145.35	99.3	105.38	145.01	150.22	126.36
- Median	41.56	48.57	22.89	25.13	47.94	48.38	34.73
- (Standard deviation)	(430.23)	(404.66)	(345.83)	(361.95)	(396.77)	(444.93)	(391.6)
Log Serving Population	3.53	3.62	3.11	3.19	3.75	3.76	3.43
- Median	3.73	3.88	3.13	3.22	3.87	3.88	3.55
- (Standard deviation)	(1.8)	(1.77)	(1.74)	(1.73)	(1.63)	(1.62)	(1.74)
Budget in thousands*	20,315.10	21,060.94	14,257.86	16,382.87	23,635.13	30,009.07	20,069.53
- Median	3,975.00	5,280.19	2,705.51	3,062.58	8,101.97	8,969.61	4,561.74
- (Standard deviation)	(95,994.93)	(92,732.51)	(77,290.2)	(92,386.14)	(74,243.76)	(12,8069.5)	(93,656.17)
Log Budget	8.13	8.27	7.88	8.04	8.73	8.86	8.27
- Median	8.29	8.57	7.9	8.03	9	9.1	8.43
- (Standard deviation)	(1.99)	(1.98)	(1.84)	(1.82)	(1.74)	(1.76)	(1.88)
Log Women:Men	-2.36	-2.33	-2.33	-2.35	-2.3	-2.26	-2.32
- Median	-2.36	-2.28	-2.32	-2.33	-2.23	-2.2	-2.28
- (Standard deviation)	(0.93)	(0.88)	(0.84)	(0.8)	(0.7)	(0.67)	(0.81)
Log Black:White	-2.68	-2.64	-2.7	-2.74	-2.76	-2.79	-2.72
- Median	-2.71	-2.68	-2.71	-2.83	-2.83	-2.85	-2.79
- (Standard deviation)	(1.24)	(1.26)	(1.25)	(1.25)	(1.22)	(1.23)	(1.24)
Log Women:Men * Log Black:White	6.76	6.57	6.73	6.84	6.68	6.6	6.71
- Median	5.75	5.75	6.18	6.55	6.33	6.31	6.22
- (Standard deviation)	(4.86)	(4.59)	(4.41)	(4.27)	(3.89)	(3.79)	(4.3)
Minimum Education Requirements	1.08	1.19	1.26	1.26	1.3	1.33	1.25
- Median	1	1	1	1	1	1	1
- (Standard deviation)	(0.47)	(0.61)	(0.68)	(0.67)	(0.68)	(0.74)	(0.66)
Training - Academy/Classroom Hours	453.07	460.1	424.14	572.9	675.43	684.93	542.73
- Median	440	475.5	456	560	640	675	520
- (Standard deviation)	(219.87)	(244.81)	(276.32)	(242.17)	(404.36)	(261.68)	(299.46)
Training - Field Hours	266.76	273.33	273.2	296.33	427.48	467.01	329.6
- Median	120	160	185.5	240	478	480	288
- (Standard deviation)	(366.84)	(311.1)	(289.67)	(279.59)	(369.21)	(345.61)	(330.92)

* In real 2007 dollars

Relatedly, median department budget in real 2007 dollars was around \$4.8 million, and again, was right skewed (mean = \$22.6 million). The majority of departments were municipal agencies (63%), and there were roughly half as many sheriff's departments (35%). Because there were so few state agencies (restricted to fifty, 2% of the total sample), these departments were dropped before model building. Thus, the final model only includes municipal and sheriff's departments.

The demographics and educational requirements of officers followed similar trends within their categories. Departments were mostly men and mostly white, with little change over the eighteen-year period. The log distributions were fairly normal in each wave. Overall, the ratio of women to men was a bit less than 1 in 10 (mean of women in departments = 8.9%, median = 6.7%). The ratio declined then returned to 1990 levels, thus changing little overall: the proportion of women officers went from 9.62% in 1990 to a low of 8.15% in 2000, then back to nearly identical 1990 proportions in 2007. The ratio of black to white officers was a bit higher than women, though its median was much smaller (mean proportion of black officers = 10.4%, median = 1.8%).²¹ This suggests a right skew, such that a small proportion of departments have a relatively higher proportion of black officers, but most departments are composed of nearly all white officers (excluding other racial groups). Unlike gender, the mean ratio increased over time, meaning departments employed relatively more black officers over the period. In 1990, the average proportion of black officers was 9.6%; this increased by about a third, to 12.3% in 2007.

Educational requirements and required training of new officers generally increased over the period. Categorically, departments most commonly required only a high school degree (81.8% of departments). However, the number of departments requiring a two-year degree or higher steadily increased, from 3.63% in 1990 to 11.66% in 2007. The number of academy hours and hours in the field also steadily increased. Departments on average required 440 hours in the academy in 1990 and 675 in 2007; required hours in the field increased from 120 to 480 in the same period.

Shifting to bivariate relationships between variables, Table 8 gives a pooled correlation matrix of explanatory variables and the militarization index; I include ALMI to give a basic descriptive sense of how the variables will relate to militarization in the proceeding analysis. More importantly, these descriptive relationships help identify multicollinearity between associated variables (with high correlations, $r > 0.8$). In such cases, I only used one of the multicollinear variables for each pairing in model construction. First, there was high multicollinearity with budget, number of sworn officers and size of serving population. Thus, I only used one of the three variables in the model to act as a marker for overall size. I used serving population, because it acts as a more direct measure of area size as well, and its log distribution, which smoothed the skewed distribution into a normal shape, was comparatively more normal than the other two variables. Next, there was a strong correlation between a department being in a city, and it also being a municipal agency; this is reasonable, considering municipal agencies *must* be in a geographic region which the census often classifies as city. Therefore, I drop "city" from model construction. Finally, there is a strong correlation between the intersection of gender and race of officers, and the independent demographic variables (gender and race). This is by design, so I do not drop any of these variables.

²¹ Because of differences in questions over the eighteen-year period, it is not possible to give an accurate representation of the intersection of race and gender. In this analysis, I use a statistical version of this interaction rather empirical. In other words, I simply multiply the totals of each variable together to create an interaction; I do not have adequate data to tell me exactly how many black men and women and white men and women are actually in each.

Table 8: Correlation Matrix of Explanatory Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
(1) ALMI	1																		
(2) Midwest	-0.02	1																	
(3) Northeast	-0.126	-0.3	1																
(4) West	0.2	-0.27	-0.22	1															
(5) South	-0.05	-0.48	-0.34	-0.34	1														
(6) City	0.04	-0.07	0.23	-0.01	-0.12	1													
(7) Serving Population	0.13	-0.05	-0.02	0.12	-0.02	-0.14	1												
(8) Log Serving Population	0.33	-0.11	-0.03	0.15	0	-0.2	0.5	1											
(9) Municipal	0.04	-0.05	0.22	0	-0.14	0.93	-0.17	-0.27	1										
(10) Sheriff	-0.04	0.05	-0.22	0	0.12	-0.93	0.17	0.27	-1	1									
(11) Sworn Officers	0.1	-0.04	0.01	0.04	-0.01	-0.02	0.72	0.31	0.01	-0.01	1								
(12) Budget	0.12	-0.05	-0.01	0.09	-0.02	0	0.81	0.34	-0.01	0.01	0.95	1							
(13) Log Budget	0.41	-0.15	-0.01	0.21	-0.03	0.05	0.45	0.9	0	0	0.33	0.37	1						
(14) Log Women:Men	-0.03	0	-0.22	0	0.19	-0.18	0.13	0	-0.19	0.19	0.09	0.09	-0.06	1					
(15) Log Black:White	-0.12	-0.12	-0.14	-0.17	0.36	-0.01	0.1	-0.12	-0.02	0.02	0.11	0.1	-0.13	0.39	1				
(16) Log Women:Men * Log Black:White	0.08	0.08	0.23	0.09	-0.34	0.12	-0.12	0.07	0.13	-0.13	-0.1	-0.1	0.11	-0.76	-0.84	1			
(17) Minimum Education Requirements	0.12	0.22	-0.04	-0.03	-0.15	0.11	0	0.08	0.11	-0.11	0.02	0.02	0.12	-0.02	-0.16	0.11	1		
(18) Training - Academy/Classroom Hours	0.22	-0.2	0.21	0.12	-0.1	0.18	0.13	0.26	0.18	-0.18	0.13	0.15	0.35	-0.1	-0.07	0.1	0	1	
(19) Training - Field Hours	0.33	-0.04	-0.11	0.19	-0.03	0.18	0.13	0.36	0.19	-0.19	0.1	0.14	0.46	-0.05	-0.13	0.1	0.14	0.26	1

Brief description of militarization

Figure 4 shows the trend of militarization over the eighteen-year period. To illustrate variation over the period, Figure 5 gives the same trend graph using box plots. In aggregate, the picture is clear: there was an observable increase in militarization over the eighteen-year period. The standard deviation wave-to-wave was relatively steady, between 11.3 and 12.5 across most waves; in 1990, the standard deviation was a bit wider, at 17.8 points. The mean and median increased over the period: the mean index of departments rose from 39.3 in 1990 to 56.7 in 2007, an increase of roughly 17.4 points, just about 1 point per year, on average. As Figure 4 shows, the increases were staggered: the largest increases were between 1993 and 1997, and again between 2000 and 2003. However, as mentioned in the alternate index analysis, wave-to-wave changes are especially vulnerable to differences in indicator inclusion.

There is not significant reason to believe that differential indicator inclusion is driving the overall change. If this was the major driving factor for growth, then we would see associated fluctuations in the index when especially influential indicators (according to the CFA) are included or excluded. Having a SWAT team, for instance, was found to be fairly influential relative to other measures. The indicator for SWAT was included in waves 1997, 2000 and 2003. However, we see only a small dip in militarization when SWAT is excluded in 2007, and we see a substantial rise between 2000 and 2003, for which it was included in both waves. In other words, indicator fluctuations seem to not be driving the overall change; instead, militarization scores increased as most indicators increased together.

Model building of militarization

To model militarization, I only included data with complete information for observations across all variables. Also, as mentioned in the description of univariate statistics, I dropped all state agencies. This required dropping 495 more agency-time observations, resulting in a final sample of 12,182 observations, and 4,052 agencies. Table 9 gives the models compared here; Table 10 gives variation and model comparison statistics for each model.

The basic empty and basic growth models (models 0 and 1, respectively) produced a baseline from which to compare additional iterations of the militarization trend. Most importantly, they provided the simplest description of what became a persistent trend across all models: *there was a significant and persistent upward militarization trend nationwide between 1990 and 2007* (in support of prior assertions). Between 1990 and 2007, the average yearly growth rate was 1.16 points.

Model 2 introduced regional controls; the reference category is Midwestern departments.²² According to Model 2, there was no significant difference in initial militarization between Southern, Northeastern and Midwestern departments; however, departments in the West were more militarized than any of the other department (9.15 points higher). In terms of militarization growth, a slightly different trend arose. Southern and Midwestern departments militarized at statistically equivalent rates, while Western and Northeastern departments grew at statistically slower rates (about 20% and 35% slower, respectively). Though the degree of militarization in departments other than those in the West were statistically equivalent in 1990, departments in the South and Midwest became more militarized over time than did Northeastern departments. At the end of the period, Southern and Midwestern departments went from an

²² I modeled variables with and without their impact on growth. I only report models that include growth effects here for the sake of clarity and brevity.

Figure 4: Trend of Absolute LEMAS Militarization Index

Figure 5: Boxplot Trend of Absolute LEMAS Militarization Index

Table 9: Modeling Militarization Over Time, using the Absolute LEMAS Militarization Index

MODEL	0	1	2	3	4	5	6	7	8	9
Constant Militarization										
Constant	48.09*** (0.170)	37.91*** (0.275)	36.61*** (0.491)	31.01*** (0.553)	30.83*** (0.647)	33.13*** (1.424)	30.28*** (0.680)	32.09*** (1.483)	26.17*** (0.875)	28.04*** (1.571)
National Region										
Region, Northeast			1.270 (0.775)		-0.756 (0.757)			-0.497 (0.764)	-0.331 (0.777)	-0.0915 (0.783)
Region, West			9.150*** (0.848)		7.184*** (0.821)			7.162*** (0.825)	6.698*** (0.829)	6.737*** (0.833)
Region, South			-0.801 (0.650)		-1.075* (0.623)			-1.144* (0.648)	-0.682 (0.630)	-0.862 (0.651)
Agency characteristics										
Agency type, sheriff				-4.504*** (0.564)	-4.373*** (0.571)			-4.493*** (0.587)	-2.346*** (0.604)	-2.441*** (0.619)
Log of Serving population from LEMAS, in thousands				3.032*** (0.156)	2.894*** (0.155)			2.819*** (0.159)	2.215*** (0.170)	2.165*** (0.174)
Agency Demographics										
Log of women to men officers†						-0.780 (0.637)		0.594 (0.618)		0.669 (0.615)
Log of black to white officers†						-1.724*** (0.508)		-0.263 (0.501)		0.0710 (0.500)
Interaction: gender and race						-0.245 (0.201)		-0.0480 (0.197)		0.0217 (0.196)
Education and Training										
Minimum educational requirements for new officer							2.293*** (0.397)		2.044*** (0.392)	1.996*** (0.394)
Required hours in the Academy							0.00794*** (0.000943)		0.00480*** (0.000975)	0.00474*** (0.000974)
Required hours in Field							0.00728*** (0.000700)		0.00489*** (0.000735)	0.00492*** (0.000734)
Militarization Growth §										
Number of years since 1990		1.162*** (0.0235)	1.298*** (0.0434)	1.048*** (0.0527)	1.205*** (0.0610)	0.977*** (0.142)	1.510*** (0.0653)	0.645*** (0.148)	1.583*** (0.0835)	0.991*** (0.156)
National Region										
Region, Northeast			-0.441*** (0.0680)		-0.441*** (0.0687)			-0.487*** (0.0694)	-0.408*** (0.0713)	-0.456*** (0.0718)
Region, West			-0.273*** (0.0723)		-0.342*** (0.0732)			-0.358*** (0.0735)	-0.290*** (0.0746)	-0.313*** (0.0749)
Region, South			-0.0125 (0.0569)		-0.0245 (0.0565)			0.0517 (0.0588)	-0.0346 (0.0575)	0.0409 (0.0594)
Agency characteristics										
Agency type, sheriff				0.0380 (0.0495)	-0.0379 (0.0504)			-0.0293 (0.0514)	-0.161*** (0.0536)	-0.162*** (0.0546)
Log of Serving population from LEMAS, in thousands				0.00556 (0.0139)	0.0116 (0.0140)			0.0108 (0.0142)	0.0532*** (0.0155)	0.0537*** (0.0156)
Agency Demographics										
Log of women to men officers†						-0.0423 (0.0657)		-0.166*** (0.0634)		-0.180*** (0.0631)
Log of black to white officers†						-0.0516 (0.0501)		-0.0996** (0.0491)		-0.128*** (0.0491)
Interaction: gender and race						-0.00850 (0.0209)		-0.0172 (0.0202)		-0.0265 (0.0202)
Education and Training										
Minimum educational requirements for new officer							-0.109*** (0.0355)		-0.144*** (0.0353)	-0.149*** (0.0354)
Required hours in the Academy							-0.000670*** (8.32e-05)		-0.000542*** (8.60e-05)	-0.000536*** (8.58e-05)
Required hours in Field							4.18e-05 (6.31e-05)		-0.000159** (6.67e-05)	-0.000185*** (6.66e-05)
Observations	12,182	12,182	12,182	12,182	12,182	12,182	12,182	12,182	12,182	12,182
Number of groups	4,052	4,052	4,052	4,052	4,052	4,052	4,052	4,052	4,052	4,052

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

† To account for departments with zero women or zero black officers, I add .5 to totals before calculating associated ratios

§ Variables taken as interaction between it and time

Table 10: Variation Statistics and Model Comparison Values for Models in Table 9

MODEL	0	1	2	3	4	5	6	7	8	9
Random-Effects Parameters										
-- Within (of militarization between departments)	63.00788	139.1845	129.391	116.3036	105.7984	134.0759	122.982	109.3818	107.8072	108.1985
-- Between (of growth between departments)		0.5921691	0.5720197	0.6275181	0.606546	0.5924373	0.6007747	0.6109419	0.6110887	0.6106452
-- Constant * growth		-6.903921	-6.762839	-7.212083	-7.121898	-6.87984	-6.938758	-7.251723	-7.153116	-7.23145
Post Estimation										
-- Deviance	98.643.66	95.222.07	94.811.08	93.970.09	93.499.91	95.028.16	94.660.38	93.389.96	93.335.00	93.236.44
-- AIC	98.649.66	95.234.07	94.835.08	93.990.09	93.531.91	95.052.16	94.684.38	93.433.96	93.379.00	93.292.44
-- BIC	98.671.88	95.278.52	94.923.97	94.064.17	93.650.43	95.141.05	94.773.27	93.596.93	93.541.97	93.499.86
-- Log Likelihood	-49,321.83	-47,611.03	-47,405.54	-46,985.05	-46,749.95	-47,514.08	-47,330.19	-46,694.98	-46,667.50	-46,618.22
Degrees of Freedom	3	6	12	10	16	12	12	22	22	28

average score of 36.6 to 58.7, Northeastern from 36.6 to 51.2, and finally Western departments increased from 45.8 to 63.2. Introducing regional controls highlights a second major pattern of successive models: *departments that were highly militarized in 1990 usually militarized more slowly over the period than did otherwise comparable departments that were less militarized in 1990.*

Model 3 considered agency-level controls independent of regional controls. Sheriff's departments were less militarized than municipal agencies, by roughly 4.5 points; however, there was no statistical difference in militarization growth across department types. As mentioned in the hypotheses, this may be associated with the fact that many sheriff's departments operate in rural areas. Also in this model is the effect of size on militarization. That association was so strong, in fact, that it can be considered as a third important pattern in national militarization: *size is significantly positively associated with constant militarization.* For every unit increase in log serving population, militarization increased by 3.03 points. Like agency type, militarization growth rates were no different across departments of differing size. This suggests that department size is related to differences in constant militarization, but not to changes in *rates* of militarization over time. For example, a municipal department serving 50,000 residents increased from 42.9 to 60.7 points, while a municipal department serving 200,000 residents increased from 47.1 to 64.9. Size is important; however, meaningful differences only arise when comparing departments of fairly different sizes, such as very small and very large agencies.

Model 4 combined agency and regional effects, with only a few changes to the pattern of militarization in relation to models 2 and 3. The difference between Western and Midwestern departments was still significant, though the magnitude of the difference declined slightly from 9.15 to 7.18. There was some statistical evidence to suggest that Southern departments were less militarized than their Midwestern departments, but the significance level was weak ($.05 < p < .1$). Across other indicators, significance of growth across comparative contexts did not change when both sets of control factors were considered together. The size of the absolute effect of population decreased somewhat, as did the difference between municipal and sheriff's agencies; but the relative statistical significance of each still remained high ($p > .001$). The constant militarization growth estimate remained significant, and its magnitude changed very little.

Model 5 estimates only the effects of race, gender and its interaction on militarization. Only the ratio of black to white officers was significant. Simplistically, this suggests that departments with more black officers relative to white are less militarized. For instance, given two departments of 100 officers each, a department with 10 black officers and 90 white would have an initial militarization score of 36.9, while a department with 40 black and 60 white officers would have a score of 33.8. Growth was the same across contexts in this model, at roughly 1 point per year.

Model 6 estimates only the effects of education and training on militarization. Here, a fourth statistical pattern emerges: *all education variables were positively related to constant militarization.* For every level increase of required initial education, militarization increased by 2.3 points. Thus, a department that required a bachelor's degree averaged 39.5 in 1990, while those that required a high school degree averaged 32.6 in 1990. Hours in the field were more related to militarization ($z = 10.40$) than were hours in the academy ($z = 8.42$), though the statistical significance threshold ($p < 0.001$) and magnitude of those associations (roughly 0.007 points per hour of required training) were substantively equivalent. Militarization growth significantly differed across requirements: departments with higher initial educational requirements or higher required academy hours grew at slower rates than did otherwise

comparable departments. However, there was no difference in growth across departments based on hours in the field. Between departments in 1990, for instance, that required 300 and 600 hours in the academy (common values), militarization scores were 32.7 and 35.0, ignoring other factors. For field hours, the militarization scores for departments requiring 100 and 500 hours in the field were 31.0 and 33.9, respectively.

Final Model of Militarization

Model 7 introduced regional and agency controls to the demographic indicators, while model 8 did the same for educational indicators. Model 9 gave the full model, including all variables. Based on model comparison indicators applicable to hierarchical linear modeling (Deviation, AIC and BIC, given in Table 10), the full model, model 9, is the preferred model. For simplicity, I will only elaborate on differences in effects between the full model and constrained models (2, 3, 5 and 6).

In terms of regional effects, again, only the West had significantly different initial rates of militarization than Midwestern, Southern and Northeastern regions. When considering other factors, growth rates for the Midwest and South were roughly the same, while Northeastern and Western agencies militarized at slower rates, with Northeastern departments militarizing at the slowest rate from 1990 and 2007. Thus, when introducing the full set of controls and variables of interest, the regional dynamic of militarization was roughly similar to the simpler model 2.

Department-level effects were still significant, but the magnitude of those effects decreased. Municipal departments were still more militarized than sheriff's, and those that served larger populations were more militarized than smaller. However, the growth rates changed somewhat when all variables were considered together. Sheriff's departments militarized at slower average rates than did municipal departments; also, departments serving larger populations militarized at *faster* rates than did smaller, making size the only variable(s) that was associated with both high constant rates of militarization *and* high rates of militarization growth over the period. All else constant, and with the inclusion of controls, an average municipal department serving 50,000 residents increased from 36.5 to 56.9 points, while an average municipal department serving 200,000 residents increased from 39.5 to 61.2. Relatedly, an average sheriff's department serving 50,000 residents increased from 34.1 to 51.7 points, while an average sheriff's department serving 200,000 residents increased from 37.1 to 56.0.

As other variables were introduced, the differences in constant demographics of agencies became insignificant for both gender *and* race, as well as its interaction. However, with other variables controlled, a fifth and final statistical pattern emerges in militarization: *the impact on militarization growth was significantly different across agencies of differing racial and gender make-up*. Specifically, departments with higher ratios of black to white officers or of female to male officers militarized at a significantly *slower* rate over the period. For instance, all else equal, a department of 10:90 female and male officers would have grown by 6.7 points over the eighteen-year period, while an otherwise identical department with 40:60 female and male officers would have grown by only 1.2 points. Similarly, a department with 10:90 black and white officers would have grown by 4.8 points, while an otherwise identical department with 40:60 black and white officers would have grown by 0.9 points.

Finally, in regards to education, the same degree of significance held relative to model 6 both for the constant level of militarization, and its growth, though the magnitude of the effects decreased as other factors were controlled. The rate of militarization growth for hours in the field also became significant and negative, suggesting lower growth for departments requiring more

time in the field over the period. Considering hours in the field was generally related to higher initial levels of militarization, this model now falls in line with the general statistical pattern that emerged from analyzing model 2: departments with high initial militarization grew more slowly than otherwise comparable agencies.

Final model analysis of indicators

I used the best model to describe ALMI to describe each indicator within it. Tables 11 and 12 present fourteen models, each with a different indicator for the outcome variable. The first model in each table is the best model of ALMI, model 9 of Table 9, reproduced here to ease comparative analysis. I discuss each indicator or indicator cluster in more detail in Appendix D; here, I highlight major patterns that clarify the prior analysis, as well as those in the future.

The first pattern is similar to the ALMI analysis: *size matters*. Many factors were tightly associated with size, including all but a few indicators measuring equipment, and the likelihood to have a SWAT team. This supports the hypothesis posited above. Police militarization seems to mostly be a process that affects large regions, especially cities. Relatedly, militarization is likely a function of municipal departments, in aggregate. Prior accounts of both police strength (see for instance, Kent and Jacobs 2005) and militarization limited their analysis to cities; this analysis provides direct support for that methodological choice. As a different mechanism, perhaps the decision to militarize is made across agencies, and centers around major law enforcement departments in particular regions. In other words, though cooperation across law enforcement agencies is somewhat rare, perhaps departments are focusing militarized resources on fewer larger departments rather than spreading such resources across as many departments as possible.

As a second pattern, *regional variation becomes more complex*. Perhaps overly simplistic, but these models suggest that militarization looks different across national regions. Northeastern departments were generally lowest in most indicators; they had the lowest sidearm power index (SPI), were least likely to allow electrical or projectile weapons, least likely to have a SWAT team or operate a drug enforcement unit, and had the smallest number of cameras per officer. However, they had the highest ratio of unmarked to marked cars, and were the most likely to have a non-lethal weapons policy. Thus Northeastern departments may have more stock of equipment and use it somewhat more often, but they are less likely to have militarized equipment, operate a PPU or have a strategy that supports militarization. Western departments were the reverse, showing some of the highest numbers across indicators. They had the highest SPI, were the most likely to allow electrical and projectile impact weapons, the highest number of dogs per officer, and they were the most likely to require body armor for its patrol officers. Midwestern and Southern departments were more complex, somewhere in the middle between the other regions. Southern departments were the least likely to allow chemical weapons, and had the smallest ratio of unmarked to marked cars and the smallest ratio of dogs to officers. Perhaps these differences are partly related to effects of size; the South and Midwest are composed of more rural areas than the Northeast, for instance. But size is insufficient; the three largest cities in the country are located in the Northeast, West and Midwest, in that order. What is more likely is that regional histories are driving these differences; more nuanced data collection could unpack these differences in future analyses.

As a third pattern, *the indicators had an extremely mixed relationship with education and training*. No variable had an identical pattern with ALMI, and in only a few cases was there even one similarity. For instance, allowing electrical weapons was negatively related to all three education and training variables, while allowing chemical weapons was completely unrelated;

Table 11: Indicator Comparison Over Time, Using Model 9

Explanatory Variable	Militarization Index	SemiAuto Power Index	Has at least one chemical weapon	Has at least one electrical weapon	Has at least one projectile impact...	Log of unmarked to marked cars	Log of dogs to officers	Operates a SWAT team
Constant Effects								
Constant	28.07*** (1.376)	1.182*** (0.0903)	0.527 (0.345)	-1.584*** (0.457)	-7.674*** (0.885)	-0.611*** (0.0761)	-1.236*** (0.144)	-5.944*** (1.679)
National Region								
Region, Northeast	-0.974 (0.645)	-0.205*** (0.0429)	-0.240 (0.165)	-1.580*** (0.269)	-0.817** (0.363)	0.115*** (0.0327)	-0.0141 (0.0631)	-1.308** (0.662)
Region, West	6.934*** (0.674)	0.269*** (0.0449)	0.265 (0.177)	1.332*** (0.205)	1.553*** (0.301)	-0.0310 (0.0343)	0.206*** (0.0575)	1.081 (0.719)
Region, South	-0.859 (0.534)	0.0320 (0.0356)	-0.799*** (0.134)	-0.232 (0.176)	-0.0651 (0.285)	-0.0990*** (0.0279)	-0.197*** (0.0490)	-0.248 (0.573)
Agency characteristics								
Agency type, sheriff	-2.039*** (0.513)	-0.00892 (0.0343)	-0.108 (0.129)	0.513*** (0.166)	-0.567** (0.254)	-0.303*** (0.0258)	0.647*** (0.0431)	-2.880*** (0.577)
Log of Serving population from LEMAS, in thousands	2.204*** (0.142)	0.0340*** (0.00948)	0.180*** (0.0360)	0.277*** (0.0465)	0.683*** (0.0782)	0.124*** (0.00780)	-0.625*** (0.0147)	1.508*** (0.188)
Agency Demographics								
Log of women to men officers†	0.630 (0.537)	-0.0247 (0.0347)	0.156 (0.132)	0.169 (0.185)	0.170 (0.334)	0.0958*** (0.0262)	-0.0122 (0.0494)	0.00414 (0.615)
Log of black to white officers†	0.462 (0.437)	-0.0646** (0.0287)	0.373*** (0.111)	0.280* (0.146)	0.238 (0.241)	0.0654*** (0.0211)	0.0550 (0.0380)	-0.172 (0.457)
Interaction: gender and race	0.140 (0.170)	-0.00933 (0.0111)	0.0789* (0.0425)	-0.00446 (0.0619)	0.0616 (0.101)	0.0191** (0.00798)	0.00437 (0.0155)	0.0488 (0.187)
Education and Training								
Minimum educational requirements for new officer	1.723*** (0.360)	-0.0207 (0.0249)	0.0653 (0.104)	-0.721*** (0.130)	0.0794 (0.154)	0.0206 (0.0164)	0.00409 (0.0265)	0.0867 (0.337)
Required hours in the Academy	0.00523*** (0.000909)	-0.000113* (6.05e-05)	0.000286 (0.000244)	-0.00131*** (0.000294)	0.000971** (0.000406)	-3.70e-05 (4.06e-05)	-4.13e-05 (6.53e-05)	0.000246 (0.000823)
Required hours in Field	0.00425*** (0.000684)	6.05e-05 (4.40e-05)	0.000235 (0.000180)	-0.000469** (0.000234)	0.00119*** (0.000331)	6.19e-05** (2.94e-05)	-2.01e-05 (5.57e-05)	0.000989 (0.000913)
Growth Effects §								
Number of years since 1990	1.056*** (0.142)	0.0713*** (0.0107)	0.196*** (0.0508)	-0.0808* (0.0431)	0.293*** (0.0717)	-0.0139* (0.00716)	-0.0504*** (0.0125)	-0.214 (0.170)
National Region								
Region, Northeast	-0.374*** (0.0603)	0.0256*** (0.00463)	0.0803*** (0.0266)	0.00385 (0.0215)	-0.0145 (0.0282)	-0.00473* (0.00263)	0.00120 (0.00470)	-0.0419 (0.0646)
Region, West	-0.334*** (0.0613)	-0.0277*** (0.00477)	0.0443 (0.0286)	-0.0294* (0.0177)	0.0110 (0.0252)	-0.00420 (0.00265)	-0.00808* (0.00414)	0.0241 (0.0708)
Region, South	0.0354 (0.0496)	-0.00174 (0.00387)	0.104*** (0.0198)	0.0172 (0.0148)	0.00781 (0.0222)	-0.00266 (0.00221)	0.0107*** (0.00362)	0.0860 (0.0562)
Agency characteristics								
Agency type, sheriff	-0.199*** (0.0457)	0.00932** (0.00368)	-0.0524*** (0.0193)	-0.0442*** (0.0137)	-0.0362* (0.0198)	-0.000657 (0.00200)	-0.00473 (0.00318)	0.0513 (0.0548)
Log of Serving population from LEMAS, in thousands	0.0485*** (0.0130)	-0.00739*** (0.00102)	-0.00243 (0.00538)	0.00336 (0.00393)	-0.0103* (0.00604)	0.000629 (0.000629)	0.00846*** (0.00114)	0.0374** (0.0178)
Agency Demographics								
Log of women to men officers†	-0.146** (0.0579)	-0.00722* (0.00423)	-0.00754 (0.0203)	-0.0123 (0.0179)	-0.0265 (0.0283)	0.00238 (0.00269)	-0.00832* (0.00463)	-0.0531 (0.0629)
Log of black to white officers†	-0.148*** (0.0446)	-0.00182 (0.00338)	-0.0489*** (0.0170)	-0.0340*** (0.0136)	-0.0511** (0.0202)	0.000114 (0.00201)	-0.00924*** (0.00338)	-0.0488 (0.0465)
Interaction: gender and race	-0.0294 (0.0185)	-0.00196 (0.00136)	-0.00578 (0.00694)	-0.00350 (0.00594)	-0.00941 (0.00871)	0.000530 (0.000829)	-0.00298** (0.00146)	-0.0194 (0.0194)
Education and Training								
Minimum educational requirements for new officer	-0.123*** (0.0324)	0.00399 (0.00271)	-0.00513 (0.0147)	0.0609*** (0.0107)	-0.0120 (0.0122)	-0.000383 (0.00140)	-0.00166 (0.00207)	0.0228 (0.0342)
Required hours in the Academy	-0.000574*** (8.09e-05)	1.38e-05** (6.02e-06)	-3.92e-05 (2.76e-05)	0.000131*** (2.48e-05)	-8.60e-05*** (3.31e-05)	3.93e-06 (3.53e-06)	4.12e-06 (5.68e-06)	-3.77e-05 (7.83e-05)
Required hours in Field	-0.000152** (6.33e-05)	-2.69e-06 (5.29e-06)	1.04e-05 (3.08e-05)	0.000100*** (2.09e-05)	-4.99e-05* (2.68e-05)	-1.03e-06 (2.70e-06)	1.72e-07 (4.61e-06)	1.60e-05 (9.00e-05)
Observations‡	12,182	10,164	12,180	12,178	10,721	10,671	5,999	7,437
Number of groups	4,052	3,993	4,052	4,052	4,036	3,589	2,374	3,534

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

† To account for departments with zero women or zero black officers, I add .5 to totals before calculating associated ratios

§ Variables taken as interaction between it and time

‡ Sample size differed for most, since indicators varied in completeness over time

Table 12: Indicator Comparison Over Time, Using Model 9

Explanatory Variable	Militarization Index	Has policy on Non-lethal force	Operates drug enforcement	Log of DTF officers to all others	Uses cameras	Log of cameras to sworn officers	Log of non-comm officers to all	Body Armor Required
Constant Effects								
Constant	28.07*** (1.376)	-0.848 (1.086)	2.100*** (0.785)	-0.713*** (0.164)	-4.182*** (1.203)	-0.801 (0.631)	0.0571 (0.0915)	-2.781*** (0.383)
National Region								
Region, Northeast	-0.974 (0.645)	1.122** (0.565)	-0.715* (0.386)	-0.00993 (0.0686)	-0.346 (0.496)	-0.601** (0.255)	0.0350 (0.0369)	-0.103 (0.179)
Region, West	6.934*** (0.674)	0.716 (0.778)	0.709 (0.488)	0.0288 (0.0631)	0.282 (0.509)	-0.317 (0.233)	0.0413 (0.0381)	0.850*** (0.186)
Region, South	-0.859 (0.534)	0.162 (0.433)	0.341 (0.332)	-0.0500 (0.0551)	0.304 (0.425)	-0.638*** (0.178)	0.00864 (0.0307)	0.314** (0.148)
Agency characteristics								
Agency type, sheriff	-2.039*** (0.513)	-1.593*** (0.457)	-1.588*** (0.334)	0.982*** (0.0491)	-0.0711 (0.389)	0.0207 (0.175)	-0.00177 (0.0294)	0.00729 (0.142)
Log of Serving population from LEMAS, in thousands	2.204*** (0.142)	0.413*** (0.138)	-0.0382 (0.0871)	-0.708*** (0.0162)	0.471*** (0.114)	-0.641*** (0.0529)	0.0252*** (0.00860)	0.0409 (0.0397)
Agency Demographics								
Log of women to men officers†	0.630 (0.537)	-0.316 (0.472)	0.122 (0.325)	-0.0324 (0.0568)	-0.540 (0.492)	-0.0503 (0.258)	0.00623 (0.0373)	-0.211 (0.146)
Log of black to white officers†	0.462 (0.437)	-0.484 (0.391)	-0.0996 (0.255)	0.134*** (0.0428)	-0.760** (0.377)	-0.249 (0.191)	0.0202 (0.0281)	-0.258** (0.120)
Interaction: gender and race	0.140 (0.170)	-0.128 (0.167)	0.0569 (0.109)	0.0247 (0.0168)	-0.140 (0.160)	-0.0682 (0.0819)	0.00870 (0.0118)	-0.0808* (0.0472)
Education and Training								
Minimum educational requirements for new officer	1.723*** (0.360)	0.468 (0.329)	-0.0441 (0.223)	0.0226 (0.0328)	-0.403* (0.241)	-0.336*** (0.106)	-0.0196 (0.0178)	0.280*** (0.0966)
Required hours in the Academy	0.00523*** (0.000909)	0.00125* (0.000683)	0.00164*** (0.000538)	-0.000353*** (8.49e-05)	-0.00197*** (0.000739)	6.37e-05 (0.000326)	-0.000309*** (4.75e-05)	0.000482* (0.000248)
Required hours in Field	0.00425*** (0.000684)	-0.000907 (0.000889)	0.000530 (0.000532)	-0.000117** (5.78e-05)	0.00224*** (0.000639)	-0.000141 (0.000285)	-7.58e-05* (4.50e-05)	0.000243 (0.000178)
Growth Effects §								
Number of years since 1990	1.056*** (0.142)	0.114 (0.110)	-0.0603 (0.0899)	-0.0122 (0.0158)	0.264*** (0.0969)	0.0391 (0.0477)	-0.0105 (0.00834)	0.257*** (0.0394)
National Region								
Region, Northeast	-0.374*** (0.0603)	-0.129** (0.0539)	-0.0321 (0.0447)	-0.00374 (0.00578)	-0.106*** (0.0391)	0.00572 (0.0190)	-0.00278 (0.00324)	-0.0112 (0.0160)
Region, West	-0.334*** (0.0613)	0.0342 (0.0808)	-0.0523 (0.0589)	-0.00194 (0.00516)	-0.109*** (0.0397)	-0.00384 (0.0172)	-0.00607* (0.00330)	-0.00108 (0.0164)
Region, South	0.0354 (0.0496)	-0.00278 (0.0423)	-0.0742* (0.0392)	-0.0120*** (0.00454)	-0.0197 (0.0338)	0.0473*** (0.0132)	-0.00359 (0.00267)	-0.0484*** (0.0132)
Agency characteristics								
Agency type, sheriff	-0.199*** (0.0457)	0.0224 (0.0435)	0.0754* (0.0389)	-0.0179*** (0.00402)	-0.0199 (0.0298)	0.0231* (0.0127)	0.00235 (0.00247)	-0.0186 (0.0120)
Log of Serving population from LEMAS, in thousands	0.0485*** (0.0130)	0.0168 (0.0133)	0.0146 (0.0101)	0.00439*** (0.00142)	-0.0227*** (0.00879)	0.0114*** (0.00388)	-0.000960 (0.000747)	-0.00421 (0.00347)
Agency Demographics								
Log of women to men officers†	-0.146** (0.0579)	-0.00345 (0.0479)	-0.108*** (0.0388)	0.00777 (0.00583)	0.00340 (0.0402)	-0.00122 (0.0199)	0.00260 (0.00344)	0.00715 (0.0160)
Log of black to white officers†	-0.148*** (0.0446)	-0.00475 (0.0393)	-0.0570* (0.0300)	-0.00171 (0.00421)	0.0241 (0.0298)	0.0176 (0.0144)	0.000277 (0.00250)	0.0309** (0.0121)
Interaction: gender and race	-0.0294 (0.0185)	-0.000683 (0.0171)	-0.0236* (0.0134)	-0.000392 (0.00177)	-7.75e-05 (0.0129)	0.00526 (0.00630)	0.000315 (0.00109)	0.00720 (0.00513)
Education and Training								
Minimum educational requirements for new officer	-0.123*** (0.0324)	-0.0124 (0.0323)	-0.0257 (0.0258)	-0.000830 (0.00278)	0.0261 (0.0185)	0.0234*** (0.00772)	0.000560 (0.00151)	-0.0154* (0.00843)
Required hours in the Academy	-0.000574*** (8.09e-05)	-8.88e-05 (6.33e-05)	-0.000117** (5.17e-05)	2.74e-05*** (7.47e-06)	0.000147*** (5.69e-05)	-9.00e-06 (2.38e-05)	2.23e-05*** (4.05e-06)	-6.09e-05*** (2.18e-05)
Required hours in Field	-0.000152** (6.33e-05)	0.000149* (8.66e-05)	1.68e-05 (6.61e-05)	8.83e-06* (5.34e-06)	-0.000116** (4.68e-05)	1.60e-05 (2.08e-05)	7.23e-06** (3.64e-06)	-5.05e-06 (1.67e-05)
Observations‡	12,182	9,159	8,955	6,347	6,423	4,031	8,621	9,349
Number of groups	4,052	3,868	3,868	2,438	3,849	2,634	3,746	4,049

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

† To account for departments with zero women or zero black officers, I add .5 to totals before calculating associated ratios

§ Variables taken as interaction between it and time

‡ Sample size differed for most, since indicators varied in completeness over time

these are opposed to ALMI having a positive relationship with all three. More than any other set of variables, both education and training were substantively different in their association with ALMI relative to their association with independent indicators. This suggests that in future analyses, even if the full model was the best model according to BIC *and* AIC, the nuanced analyses of each indicator suggests education and training should be excluded.

A fourth pattern emerges when unpacking the variable trends in finer detail: it seems *drug enforcement was primarily a task for municipal agencies, while drug task forces themselves were primarily an endeavor for sheriff's departments*. Contextually, this suggests that drug enforcement is primarily a task for cities and towns, perhaps because municipal agencies have greater contact with larger portions of people, especially those who were most likely to be arrested for drug offenses. Empirically, drug enforcement has been most active against disadvantaged minorities, especially blacks (Bjerk 2007; Mosher 2011; Rojek, Rosenfeld, and Decker 2012; Sampson and Lauritsen 1997); In 1990, 83.8% of all black US citizens lived in cities, compared to 75.6% of all white US citizens (Census 2002). Relatedly, there was little change in either of these variables over the seventeen-year period. This is likely an artifact of the timeframe of the analysis: in terms of dollars spent, the drug war escalated rapidly in the 1980s, reached its peak in the mid-1990s, then plateaued until passed 2007 (Alexander 2012; Balko 2013; Beckett and Sasson 2000). Since this sample *begins* in 1990, statistics associated with drug enforcement *should* be flat over the period, though quite high within waves; this is, unsurprisingly, the general pattern. Similarly, there was little change over the period in the proportion of community officers, which again, grew in popularity in the beginning of this sample, but plateaued in a similar fashion to drug enforcement operations.

As a fourth pattern, *equipment variables of various kinds (signaling having the item, but not stock of that equipment) was generally associated with gender and race of officers*. For racial demographics of officers, if departments had a high ratio of black to white officers, then they were more likely to allow a chemical weapon, and they tended to have a higher ratio of unmarked to marked cars. Over time, however, these more diverse departments had lower growth in three cases: they were less likely to eventually allow chemical, electrical or projectile impact weapons, were less likely to eventually engage in drug enforcement, and had a slower increase in the number of dogs per officer. Relatedly, departments with a high ratio of women to men had slower growth in their SPI, the number of dogs per officer, and were less likely to eventually have drug enforcement operations. Consistent with differences across departments in ALMI, something about the demographic make-up of officers seems to be associated not just with overall militarization growth, but also with growth of many of the individual indicators.

As a final pattern, *growth was highest in two of the three theoretical dimensions of militarization*. First, departments tended to be increasingly open to allowing a greater variety of equipment, including higher SPI values, and increasingly allowing chemical and projectile impact weapons. However, in terms of the *stock* of that equipment, there was evidence that stockpiles decreased, if anything. Both the ratio of unmarked to marked cars and dogs to officers decreased over the period. Hence departments over the period were increasingly open to using more types of equipment, but they not necessarily stockpiling equipment *in lieu of other factors*. Second, departments were increasingly more likely to use cameras and to require body armor for its patrol officers, which was consistent with an increased focus on military-style policing. But the third dimension, assessing the use of militarized equipment, changed very little over time. Only in large serving populations was change evident, in that they were more likely to eventually have a SWAT team or have more drug task force officers. Taken together, there is evidence that

departments in general are using a greater variety of militarized equipment and that they are increasingly focusing on military-style policing, but only the largest departments are also expanding their use of militarized equipment and PPU usage.

Discussion

This analysis described several prevailing themes. First, perhaps most importantly, this analysis supports the contention that American police have militarized. Despite the introduction of controls, the pattern held: departments exhibited a steady systematic increase in militarization over the period. This growth was estimated from a nationally representative sample of over 4,000 police departments, and includes relevant controls. In meaningful terms, this suggests that departments have a larger variety of offensive equipment, are supporting military-style policing more often, and are more likely to participate in drug enforcement activities. The individual indicator analysis found that trends associated with variety of equipment, military-style policing attributes and drug enforcement followed similar patterns. Some indicators changed little over the period (such as number of community officers and dogs per officer), while others only changed when other factors were considered (only larger departments were likely to take on a SWAT team, for instance). Taken together, there is meaningful evidence to suggest that the traits of the militarized department are becoming more common across departments, such that the militarized department simply become “the police” in the next few decades. Although the data ends in 2007, the increase in public attention to police militarization really began in 2014, after the shooting of Michael Brown. This rise in public attention could signal that police have indeed become even more militarized since the end of this analysis.

Second, there is a seeming convergence across departments: departments were either fairly militarized in 1990 with a slow increase over time, or departments were less militarized in 1990, but militarized relatively faster than their more militarized peers. This may be a statistical artifact, akin to regression-to-the-mean, but it could also represent other organizational trends. For instance, this trajectory is consistent with diffusion processes, where early adoption of militarization for some “leader” departments encourages other “follower” departments to catch-up. The decline in militarization variation over the period lends some additional evidence towards this kind of pattern. However, for a decisive explanation of the mechanism driving this pattern, further analysis is required.

Third, militarization is most strongly related to department size: larger departments, as measured by serving population, were categorically more militarized than smaller departments, and when other factors were controlled, were militarizing faster than their peers. This was the only pattern that was counter to that of the prior paragraph. Size was more influential than all other variables in terms of its statistical significance and its relative magnitude when predicting constant militarization differences and differences in growth. The closer analysis of individual indicators followed the same pattern: larger departments were more likely to have a SWAT team, more likely to allow a variety of nonlethal weapons and more likely to participate in drug enforcement. Size marks budget, geographic location, and perhaps organizational capacity. It also marks the kinds of problems that large departments may be more likely to handle. In other words, size is associated with metropolitan areas that face criminal justice problems that smaller agencies may experience less often, such as violent crime (National Center for Victims of Crime 2013), which may drive departments toward militarization. Further analysis should analyze the impact of crime or crime control methods

Fourth, the relationship with education and training was complex. The analysis of ALMI suggests a persistently positive association with militarization, both in constant differences and in relation to growth. Both greater education and training go hand in hand with higher rates of overall militarization. Perhaps militarization is still associated with professionalization processes that define what makes a department “good” or “legitimate;” perhaps the organizational structure and strategic direction that supports militarized policing is also related to higher levels of required training and education. However, the closer analysis of individual indicators suggests a more complex relationship. No indicator followed the same positive relationship with education or training variables, independent of other indicators. Most indicators had mixed associations, either with negative associations with education and training or no association. Whereas the association between individual indicators and specific variables loosely matched the overall index, here the index is suggesting a completely different relationship than nearly every other indicator. As such, education and training should at minimum be dropped from future analyses, at best be further explored with more nuanced measures.

Finally, diversity is related to militarization over time. Specifically, departments that employed more women or more black officers relative to men or white officers militarized at a slower rate. The individual indicator analysis found a similar relationship, though there were a few minor differences. Perhaps black officers or women were more likely to directly resist militarization, both as line officers and as executives. Or perhaps when departments are taking steps to actively recruit black officers or women, they also tend to engage in non-military-style policing, such as community policing. Or still another possibility is that those departments that employ statistically more black officers or women operate in populations that are in some way different from otherwise comparable populations. Perhaps those populations are more likely to trust or cooperate with police officers, for instance. Further analyses can at minimum assess the association between racial composition of the area and its impact on police militarization.

These broader patterns were in addition to other control-based factors that should not be discounted. Regionally, Western departments were initially more militarized than any other region, though Southern and Midwestern departments militarized at higher rates than others. Individual indicators demonstrated some variety in how departments militarized, suggesting that militarization itself *looked* different across regions, as well. Though against the initial hypothesis, the overall trend is in line with the development of militarization; after all, the first SWAT teams began in the West.

Coupling regional, demographic and agency trends together, it seems likely that neighborhood effects could be associated with militarization. People are not evenly distributed across the US, nor are they evenly distributed across counties. Municipal departments tended to be more militarized than sheriff’s, and militarized faster over the period. Perhaps the differences in militarization uncovered by the model are associated with these population differences. Economic realities like poverty and unemployment, or housing segregation may be influencing differences in militarization, for instance. Differences across other demographic indicators, such as racial disparities in arrests or even differences between the racial make-up of officers and their serving populations could also be driving these differences.

Limitations are obviously present. This is a United States-centered analysis, which in the context of policing, means that the process of militarization may look quite different in other countries. This is especially relevant for context-specific effects; for instance, if race is driving regional or size-based differences, race could reasonably affect policing differently in other countries. As a second limitation, the militarization index was developed from a dataset that was

not intended to measure militarization. Therefore, the questions in the original survey were not as theoretically specific to militarization as in Kraska & Kaeppler's 1997 survey or the ACLU's survey in 2014. I focused a majority of this paper on the metric of ALMI for this reason, and pursued the project because I saw the great potential of LEMAS: it provides a rich source of generalizable, longitudinal information that, in regards to inter-organizational police information, is the best source of its kind. As a third and related limitation, this index is tied to the LEMAS dataset; thus, it must be used in conjunction with LEMAS for all comparison purposes. Also, problems associated with LEMAS itself (changes in questioning, reliance on self-report, etc.) then go on to fundamentally affect ALMI. Luckily, LEMAS has formally existed for over two decades, and has been connected to a variety of useful correlates for police functioning, including educational standards, a variety of crime data sources and US Census data. In other words, even though this index is tied to LEMAS data, LEMAS is established, and allows for a wide variety of questions related to both police militarization and to social control more generally.

The applications beyond this article are wide. This is the first empirical analysis of militarization of this geographic and temporal scale. Further analysis is required with ideally more comprehensive data. To improve the analysis, an index that draws from a survey that is specific to militarization would allow more precise analysis going forward. Specifically, introduction of measures that more comprehensively track militarization *use* and military *culture* would improve the index substantially. This should not undercut the potential power of this index; additional analyses using this theoretically informed index and its associated indicators is now possible. Further studies can address factors that lead to militarization, for instance, criminal and organizational influences. Relatedly, the effectiveness of militarization can also be analyzed, in terms of the impact on arrests or of differences across regions of differing racial or economic make-up.

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