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Research, Theory, and Practice

Reducing Fatal Police Shootings as “Systems Crashess”: Research, Theory, and Practice

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■ Abstract

Can fatal shootings by American police be reduced? If so, what theoretical framework would be most useful in saving more lives? What research agenda would that framework suggest? The purpose of this review essay is to answer those three questions. It applies the “systems accidents” framework ([Perrow 1984](#x_bib40)) as a pathway to help policing agencies reduce fatal police shootings, re-naming it here as “systems crash prevention” to promote a more blame-neutral view of the causation of such events.  In contrast to the dominant policy perspective reducing fatal shootings, *deterrence*, a *systems crash prevention* approach applies lateral thinking from lessons learned about airplane crashes, surgical error, nuclear power plant meltdowns and other rare events in complex systems. This framework spotlights the rare *combinations* of risk factors and errors that produce tragic events, which may vary widely between large and small communities. Half of all 986 fatal police shootings nationally in 2015 (Washington POST 2017) occurring in cities under 50,000 residents, even while 31% occurred in cities over 250,000 ([Sherman 2015](#x_bib57)). The systems designs for fewer police killings in very large versus very small police agencies requires a general framework for policy-relevant criminology. The framework suggested by [Sampson, Winship & Knight (2013)](#x_bib48) requires research to identify 1) *causal mechanisms* that may generally help to reduce fatal police shootings, but that may also have 2) *heterogeneous effects* on different subpopulations that may work differently when their application is 3) *contextualized* in different social settings. Future research must therefore include communities of all sizes to encompass the majority of all fatal shootings.

Keywords police shootings, deadly force, organizational behavior, production pressures, system accidents, system crashes, gunshot wounds, theory and public policy

INTRODUCTION

On July 28, 2017, at a speech in Suffolk County, New York, the President of the United States encouraged police nationally to use excessive and illegal force against immigrant suspects (Haberman & Robbins 2017). Some police officers present at the speech responded to the President with applause. Yet almost instantly, the Suffolk County Police hosting the President Tweeted its official condemnation of the President’s remarks. Within hours, police leaders from around the nation responded with equally pointed criticism (Editorial Board 2017). The President of the Major Cities’ Chiefs Association (Manger 2017) said that “As a cop for the past 40 years, I was appalled when I heard the President of the United States condone injuring an individual in police custody.” The Suffolk County Police Tweet reinforced its message with this threat of punishment (Haberman & Robbins 2017):

“As a department, we do not and will not tolerate roughing up of prisoners… [we have] strict rules & procedures relating to the handling of prisoners. Violations of those rules are treated extremely seriously.”

Thus three years after a Ferguson MO police officer shot and killed Michael Brown, the national dialogue about policing and force remained focused on *punishment* of police who break the rules. The pluralism of that debate (Sklansky 2008) is evident in the conflict between a US President who is against punishing (at least some illegal force by) police, professional police leaders in big cities who threaten to punish illegal police conduct, and the police officers present who applauded the President. That pluralism is also evident in the repeated failures of jurors in 2016-17, even in the face of powerful video evidence, to convict police of crimes for their fatal shootings of such unarmed Black men as Samuel DuBose in Cinncinnati OH, Walter Scott in North Charleston, SC, Terence Crutcher in Tulsa OK, and Philando Castile in suburban St. Paul MN (Blinder 2017; Bosman et al 2017). The same pluralism is evident in the continued high approval ratings of local police by white citizens since Michael Brown’s death, even as nonwhites, Democrats and big-city residents give their police consistently lower levels of approval (Gallup 2016).

Evidence of pluralism in a democracy about *whether* police should be punished for excessive force poses a strong challenge to punishment and deterrence as the primary strategy for reducing fatal police shootings. While there is research evidence that such punishment can be effective, it is often very difficult to achieve. The great importance of achieving justice for its own sake does not make punishment the only, let alone best, way to save lives. As this essay concludes, more police shootings may be prevented by focusing on *organizational systems* than by any other strategy. The attacks on President Trump by national police leaders shows that they can offer an independent source of power to save lives. Given the complexity of the problems at stake, the criminology of fatal police shootings may be of greatest value in helping them to re-design policing systems.

These organizational systems are central to what the Tulsa jury said in its statement about their acquittal of the Tulsa officer who killed Terence Crutcher, “The jury could not, beyond a reasonable doubt, conclude that she did anything outside of her duties and training as a police officer in that situation.” (Ellis 2017). The Tulsa jury offers a clear challenge to both criminology and police leadership: to design the kind of recruitment, training, promotions, supervision, dispatching, tracking, decision-making and organizational culture that can make shooting an unarmed man like Terence Crutcher unthinkable, and any failure to render first aid after a shooting by police even more so (see video of Crutcher shooting at <https://www.youtube.com/watch?v=Kopdb1c2b1M> ).

This review essay shows how the 20th-Century success of a *deterrence* framework in reducing fatal police shootings may be surpassed by developing a *systems crash prevention* framework in our current century. The first section of the essay, “Criminology and Police Shootings,1963-2000” reviews how research helped to restrict the legal power to kill fleeing felons, followed by the failure of criminology to detect and confront the high death toll associated with “defense-of-life” shootings since 1990. The second section of the essay, “Recent Criminology of Police Shootings,” shows how, with the major exception of Zimring (2017), recent research has generally been too explanatory (rather than policy-oriented) in focus to promote the major changes needed to reduce the almost 1,000 fatal shootings reported annually (Washington Post 2017). The third section of the essay, “Systems Crash Prevention” develops an organizational perspective on police shootings; adapted from Perrow’s (1984) “systems accidents” framework in a way that provides room for preventing both intentional and unintentional actions, both defensive and malicious shootings, as part of the framework (Badger 2015; Richtel 2016), this framework includes Perrow’s key concepts of interactive complexity, tight coupling and production pressures. The fifth part of the essay, “A Tale of Two Policing Systems,” illustrates the life-and-death difference between the crash-prone and crash-preventive police organizational systems, respectively, in Cleveland OH and Camden NJ. The final section of the essay, “A Research Agenda for Preventing Police Shootings,” offers recommendations for two different approaches to systems crash prevention: re-engineering core police functions, such as dispatch management, and introducing new features, such as first aid equipment and immediate police transport of people they shoot to the nearest hospital.

The key to success for research and development of a systems crash prevention framework is to make it adaptable to a wide range of contingencies and contexts. Space permits only limited attention to these variations, but the essay tries to deploy a more general framework for policy-relevant criminology suggested by [Sampson, Winship & Knight (2013)](#bib48): research should identify 1) *causal mechanisms* that may generally help to reduce fatal police shootings, but that may also have 2) *heterogeneous effects* on different subpopulations that may work differently when their application is 3) *contextualized* in different social settings. That framework is especially relevant to this review because of the recently-established fact that half of all fatal police shootings occur in cities under 50,000 residents, even while 31% occur in cities over 250,000 ([Sherman 2015](#bib57)). Whether or how various systems crash prevention designs may prevent police shootings in the different contexts of very large versus very small police agencies is central to the research agenda proposed below.

CRIMINOLOGY AND FATAL POLICE SHOOTINGS 1963-2014

Two Great Awakenings of Protest and Scholarship

America has reduced fatal police shootings once before, with criminology playing a key role in what can be called the “First Great Awakening”[[1]](#footnote-1) of both public and scholarly sentiment against avoidable police shootings. From 1970 through 1985fifty big cities took actions that cut in half the annual count of citizens killed from 353 to 172 per year ([Sherman & Cohn 1986](#bib60)). The major change during this period was a growing ban on shooting nonviolent fleeing suspects. This now-forgotten change in police-citizen violence saw both killings *by* and killings *of* police fall dramatically, by 51% and 65% respectively. The denouement of this first “Great Awakening” was the 1985 US Supreme Court decision of *Tennessee v. Garner* (471 US 1) that declared the law of almost half of US states unconstitutional in permitting police to kill nonviolent suspects. Coming at the end of a long gradual spread of this ban across big cities, the Garner rulting seemed to push down the FBI’s national count of voluntarily reported “justifiable homicides by police” still further ([Tennenbaum 1994](#bib66)), perhaps largely in the smaller cities that had not already adopted the ban.

The First Great Awakening faded with the Crack epidemic of the late 1980s.As big-city homicide rates spiked, criminologists and national news media seemed unaware that police killings of citizens went back up in the early 1990s ([Zimring 2017](#bib78):27), when many police agencies shifted from revolvers to semiautomatic pistols with large ammunition clips. The influence of the US supreme Court decision in Graham v. *Connor*, 490 U.S. 386 (1989) is also blamed for reversing the benefits of *Garner,* since in *Graham* the Court ruled that police could justify killing people if they reasonably believed in the circumstances that the person shot was putting a life was in danger. While many leaders of Black communities in cities both large and small seemed well aware of the continuing police killings they faced, by the mid-1990s the national good news of declining general homicide rates became the dominant crime story well into the present Century. Not until Police Officer Darren Wilson killed Michael Brown in Ferguson MO on August ninth, 2014, did Americans witness a “Second Great Awakening” of concern and debate over police-citizen violence.

Unlike the first Awakening, the Secondhas been fed by a steady stream of online videos of police shootings, many of them criminal, and many more “avoidable.” While this Second Awakening saw an initial post-Ferguson decline in public approval of their local police in 2015 (the lowest in 22 years), it was also followed by a substantial increase in killings of police in 2016 over 2015 (63 over 41), which may have prompted a subsequent half-century high in Gallup poll ratings of police approval ([Gallup 2016](#bib21)). Even that volatility, however, may suggest the increased intensity of public feelings about police since 2014.

So far this Second Awakening has not been accompanied by any substantial drop in killings by police, but it has seen other important changes. Most important is a major change in national measurement of fatal police shootings---not by government, as recommended by the Presidential Task Force on 21st Century Policing ([2015](#bib42)), but independently by two newspapers, the Washington POST and the UK’s GUARDIAN ([Zimring 2017](#bib78)). Both of these counts of online news reports of police killings in the US showed over twice as many deaths caused by police as counted by the voluntary federal data. Both newspapers reached fairly similar counts of the number of people shot to death by police in 2015and 2016, converging just under 1,000 in both years. Using the 50% drop in big-city killings by police in 1970--84 as a benchmark, a comparable success by the Second Great Awakening could save 500 lives a year.

The Second Awakening has also seen some change on other fronts. There has been legislative action by 16 states on police training in de-escalation tactics ([APMReports 2017](#bib3)), a rapid spread of police wearing (if not always activating) body-worn video cameras, and other new practices, some of them consistent with the recommendations of the Obama panel ([Presidential Task Force 2015](#bib42)). It has produced fascinating new initiatives by police chiefs to slow down police decisions to shoot people, such as the new “Hippocratic Ethos of Policing” in Camden NJ ([Goldstein 2017](#bib24)). And there is small but growing body of new research published by policy-oriented criminologists, led by [Zimring (2017)](#bib78).

What the Second Awakening has not yet seen is a growing body of the kind of criminological impact evaluations of the First Great awakening. One prime example is the innovation of de-escalation training. Despite the spreading state legislation, it appears that not one impact evaluation of that training has been conducted or published (Engel et al 2017). An ongoing systematic review of 99 data bases using 16 search terms has identified over 40,000 potentially relevant titles, but only 62 evaluations of de-escalation training in any field (including schools and mental hospitals); of those, only one was done with police (in Switzerland, N = 29), but no behavioral measures were employed (Berking et al 2010, as cited in Engel 2017). Similarly, a wide range of field research has been done on body-worn video cameras, but there is apparently no research on the effect of such cameras in altering shooting behavior. Thus two of the most rapidly spreading innovations in police reform may have gone completely unevaluated with respect to use of guns.

Criminology of Fatal Police Shootings in the First Great Awakening

The criminology of fatal police shootings began with descriptive studies that quickly led on to policy evaluations, ultimately helping to make case law with empirical evidence. [Robin’s (1963)](#bib46) finding of huge variations in rates of citizens killed across major cities suggested vast discretion which might be restricted, based on the voluntary reporting to the FBI of “justifiable homicide by police.” [Milton et al. (1977)](#bib37) produced the first comparative analysis of police shooting deaths based on review of police agency files on each case, followed by other agencies allowing in-depth descriptions by [Meyer (1980)](#bib36) in the LAPD, and by analyses in other agencies (see [Geller and Scott 1992](#bib22)).

This descriptive research on shootings built on the American Bar Foundation’s studies in the 1950s, which had documented extensive discretion in massive field studies (e.g. LaFave 1965). This research led to publications on how to restrict legally-permissible police discretion through organizational policy-making (Remington 1965; Goldstein 1967; President’s Commission on Law Enforcement and Administration of Justice 1967). One participant in these discussions was New York Police Commissioner Patrick V. Murphy, who (with other police chiefs) spent two weeks at a University of Wisconsin Law School seminar sponosred by the Police Foundation in 1971 (Herman Goldstein, Personal Communication, July 2017). Shortly after that, Murphy launched a major initiative to restrict police shootings in New York City. This initiative inspired many replications, but they were helped along by the pioneering work of James Fyfe (1978) in documenting the impact of these changes in extensive detail.

This convergence of academic work with pioneering police leadership must be understood in the context of police shootings as one of the major civil rights issues of the era. In 1968, as head of the Washington DC police, Patrick V. Murphy had already challenged Chicago’s Mayor Daley during the riots after Dr. Martin Luther King’s murder in 1968. Daley had ordered Chicago Police to “shoot the looters.” Murphy told his police *not* to shoot the looters. This prompted a national debate over deadly force that Murphy continued in New York in 1972, when he put to good use the Goldstein-Remington-LaFave framework for structured discretion in re-engineering the policies, training, supervision, review, discipline and organizational learning systems for police shootings in the NYPD, ([Fyfe 1978](#bib18)). This decision launched a process leading not only to Fyfe’s series of publications, but eventually to a 91% drop in New York’s police killings by 2010---from 93 citizen deaths in 1971 to 8 in 2010 (Figure 1).Other police leaders then followed Murphy’s initiative, including Kansas City Police Chief Joseph McNamara in 1973--75 and Atlanta’s Lee Brown, and were also evaluated by criminologists ([Sherman 1983](#bib53); [Geller and Scott 1992](#bib22): 276--279). The primary audience for this research was the U.S. Supreme Court, to which an alliance of big-city chiefs and criminologists submitted a joint *amicus curiae* brief in the case of Tennessee v. Garner. The key research findings for Constitutional law were the answers to the 6th US Circuit Court of Appeals hypotheses in Wiley v. Memphis (1977)), and central to the Garner case, which claimed that if police shoot less crime will go up and police will get hurt more. The *Garner* court cited [Fyfe’s (1978)](#bib18) and [Sherman’s (1983)](#bib53) research showing that restrictions led to no adverse effects on police officer safety and crime, but that large reductions in police shootings did follow, after restrictive rules were imposed.

In the same general time period, other case studies of often controversial restrictions on shooting nonviolent suspects, as well as restrictions on shooting at cars or shooting warning shots, showed that restrictions worked in every case. [Geller and Scott (1992](#bib22): 257--267) reported reductions in shootings by police in the immediate aftermath of such policy restrictions in the 1970s and 1980s in Oakland, Los Angeles, Dallas, Omaha and Memphis, without any evidence of increased injury to police or of any overall increases in the severity of crime.

Yet Fyfe (1982) and Sherman (1983) both concluded, independently, that merely changing of policies was not enough. Other elements of organizational change seemed to be essential, including external demands and internal leadership, both insuring that policies are implemented and enforced. Their conclusion received further support from [White’s (2001)](#bib74) late contribution of data from that era of policy changes by analyzing 982 Philadelphia police shootings from 1970 through 1992, in relation to two major policy changes: one loosening restrictions on situations in which police were allowed to shoot (1974) and one tightening those restrictions again (1980). The evidence suggested that while policy restrictions made some difference, the rhetorical messages from the Mayor and Police Commissioner produced effects that over-rode the policy content.

While these detailed insights came from just four cities, they reflected a general trend sweeping across at least fifty of the 59 cities with over 250,000 residents in 1970. [Sherman and Cohn (1986)](#bib60) reported from a mail and telephone survey that total citizens killed across those cities dropped from 353 in 1970 to 172 in 1984 (the year before the Garner decision). The death rate per 100,000 residents went down in twice as many cities (32) as those where the rate increased (16) ([Sherman & Cohn 1986](#bib60): 12). Equally important, the number of police killed feloniously in total across those cities in those years dropped from a peak of 28 to a low of 13, with an average of 29 per year in 1970--75, finally dropping to 14 per year in 1976--80 and 17 in 1981--84. While the decline in murders of police may have occurred for reasons independent of the decline in killing citizens, (e.g., more bullet-proof vests), it appears that shooting fewer citizens caused no increase in any death rates.

The most striking finding in research of that era was never published, but bears a full display here as Figure 2. The National Urban League obtained the race of decedent data from the FBI’s compilation of police agency voluntary reporting of Justifiable Homicides by Police for the period 1970 through 1979 in 57 of the cities over 250,000 (Mendez 1983). Their finding was a striking reduction in racial disparity. While there were still almost 3 blacks killed for every white person killed by police in those cities at the end of the decade, the low of 2.5 to 1 was still a two-thirds reduction in disparity from the peak of 7 to 1. Moreover, since the absolute rate of blacks killed declined, this finding also shows a substantial saving of lives---perhaps the majority of lives saved in the overall drop of big-city police-citizen violence.

Whatever the causes of the drop in police killings in big cities, it seems unlikely that they were limited to formal organizational policies or programs. This point has recently been made in the context of a large Australian city (Melbourne), where restrictive laws were held constant while fatal shootings spiked and then fell in response to two organizational changes---both internal responses to external conditions ([Saligari & Evans 2015](#bib47)). After a series of murders of city police in the 1980s, a new training emphasis on danger to police apparently encouraged more pre-emptive use of force, with a sharp increase in fatal shootings of citizens. That led, in turn, to a public outcry---including the State Coroner’s criticism of a “culture of bravery” leading rapid confrontations rather than delay and negotiation. The new response in the early 1990s was to launch Project Beacon:

“a new 5-day training project for all operational officers, underpinned by a ‘safety-first’ philosophy: safety for officers, safety for the community and safety for the suspect…. The immediate impact of this training was remarkable and a culture of safety first had effectively permeated through all levels of Victoria Police’. ([Saligari & Evans 2015](#bib47): S82)

Fatal police shootings State-wide dropped by 50% in the short run after Project Beacon. By a few years later, however, the numbers began to climb again, with mentally ill suspects comprising nearly a majority of persons killed. This echoes the conclusion from US case studies: that there is no single intervention that is likely to have a lasting effect on fatal shootings. Nonetheless, the first wave of US research featured substantial attention to policy interventions. That is more than can be said of most recent research.

RECENT CRIMINOLOGY OF POLICE SHOOTINGS

It is clearly premature to compare three years of post-Ferguson criminology of police shootings to 30 years of work done in the first Great Awakening. Yet so far little of it is focused on systems changes that could prevent police shootings. The major exception is [Zimring’s invaluable (2017)](#bib78) analysis of a wide range of accessible statistical data, notably the *Guardian* website for people killed by US police[[2]](#footnote-2) in a sample comprised of all 551 listed deaths in the first six months of the total of 1,146 deaths in 2015. Similarly, [Sherman’s (2015)](#bib57) unpublished ASC paper analyzed all 620 of the first 7.5 months (through August 17) of the 991 total 2015 cases included in the *Washington Post* data base of fatal shootings by police.[[3]](#footnote-3)

While Zimring’s book addresses a range of questions, its diagnostics and policy recommendation offer the most comprehensive contemporary treatment of the problem. A selection of his most important diagnostic observations, based solely on the news media accounts compiled by the *Guardian*, can be presented most clearly in a list (with page references for each point):

1. Most people killed by police in responding to calls are white non-Hispanics (52%), with African-Americans at 26% and Hispanics at 17%. (p. 45).
2. Proportionate to the national population, African-Americans are 2.3 times more likely to be killed than whites, and Native-Americans are twice as likely; there is no elevated rate of death for Hispanic over non-Hispanic whites.(p. 46).
3. Proportionate to age of arrestees, people (95% male) are *less* likely to be killed given an arrest if they are under age 30, and twice as likely to be killed given an arrest if they are over 40. (p. 47).
4. The most common situation in which police killed people was disturbances (23%), of which about half were domestic. Criminal investigations comprised 15% of fatal encounters, arrest and crime in progress combined accounted for 14%, traffic stops comprised 9%, while “armed and dangerous” and “shots fired” combined summed to 7% (p. 54).
5. Deaths of African-Americans were twice the proportion of arrest-related cases (41%) as of noncriminal justice cases (20%) (p. 54).
6. There was no firearm present in 44% of fatal police shootings. (p. 57).
7. A firearm or knife was in the decedent’s possession in 72% of deaths. (p. 57).
8. More than one officer is present in most police killings (65%), but 37% of killings by officers who are alone kill suspects who have no guns, compared to 11% of deaths occurring with multiple officers present (pp. 60--61).
9. The precipitating suspect conduct for police killings in 40% of cases was pointing a gun or shooting at police, in 24% was “brandishing” a gun, in 13% charging at police, in 4% driving a car at police, in 3.4% “ran” (which is generally unlawful under *Garner)* and 1% officers stabbed or cut. (p. 62).
10. In the limited portion of cases reporting the number of bullets fired, police fired four or more bullets at the suspect in 32% of cases, thus increasing the risk of death (pp. 64--69.

[Zimring (2017)](#bib78) provides excellent interpretations of these findings on a number of levels. Yet what his diagnosis strikingly omits is the organizational and community context of these events. While he does note that there are substantial regional differences with respect to population-based rates (p. 70), he does not address the elephant in the room of American policing: the huge difference between large and small communities (and the corollary size of the police agencies). For this we must report [Sherman’s (2015)](#bib57) findings that the majority (51%) of fatal police shootings reported by the Washington POST occurred in communities of under 50,000 people, and almost 70% occurred outside of the major cities (250,000 people or more) where shootings had already declined so much during the First Great Awakening.. While those cities still accounted for 30% of fatal police shootings in 2015, their rates per 100 homicides were only one-sixth of the rates of the smallest communities: those under 10,000 residents (Figure 3). The homicide rates by size of community is arguably appropriate to use as a benchmark of risk, especially since in most analyses across communities homicide rates are positively (and strongly) correlated with fatal police shootings ([Sherman and Langworthy 1979](#bib58); [Liska & Yu 1992](#bib32); [Klinger et al. 2015](#bib31)). The near-linear, monotonic negative relationship between city population size and fatal police shootings is striking.

Explanatory Research. Neither Sherman nor any other criminologist has done much to understand or explain the apparently large role of community size in relation to fatal police shootings. The best recent use of any kind of contextual analysis is reported in [Klinger et al’s (2015)](#bib31) study of 230 police shootings in St. Louis, but their very nuanced study was necessarily limited to neighborhood differences within one large city. Moreover, they rightly challenge the many cross-city analyses based on what we now know to have been the grossly under-reported FBI data on justifiable homicides by police officers ([Sherman and Langworthy 1979](#bib58); [Liska & Yu 1992](#bib32); [Sorensen et al. 1993](#bib64); [Jacobs & O’Brien 1998](#bib27)). Ironically, what they are studying turns out to be the dregs of the problem America faces: relatively small variations in the low rates per 100 homicides found within a big city, rather than the very large variations across cities of vastly different sizes. Yet their finding of a curvilinear relationship between police shootings (both lethal and nonlethal) and block-level firearms violence is an important discovery: police shootings become less likely at the highest levels of overall firearms violence than at the levels just below the top, where police shootings peak. If further research shows it to have consilience with cross-city studies, it could be an important way to inform contextually-appropriate policies ([Sampson, Winship and Knight 2013](#bib48)). The benefit of contextual studies like [Klinger et al. (2015)](#bib31) is thus to draw attention to organizational differences in the potential causal mechanisms or their policy applications for reducing shootings.

Few other recent studies yield that benefit. Rather than explaining differences in fatal police shootings across or within organizations, most post-Ferguson criminology focuses on differences (by race) across suspects and differences across. In the former category are simulation studies showing greater and lesser likelihood of officers (or laboratory subjects) shooting white versus black suspects (see [Fridell 2016](#bib16); [James et al. 2016](#bib28)). In the latter category is a cohort-based analysis of almost 2,000 Philadelphia police officers tested for self-control levels upon hiring, 5% of whom went on to shoot at someone in the first years of their careers ([Donner et al. 2017](#bib12)).

The Philadelphia study found significantly, but not substantially, higher levels of likelihood to shoot among officers with less self-control, as measured by a range of noncompliant behavior such as traffic violations. For every additional point on a scale of poor self-control from 1 to 7, there was a 21% increase in the odds of officers shooting their guns. Yet that finding is less impressive than the huge swing in police shootings by Philadelphia Police that [Zimring (2017](#bib78): 237) reports but does not relate to a leadership change: 62 shootings in the year before Charles Ramsey became Police Commissioner (in January 2008), reduced to 42 in the first year and 23 in 2015, his last year as head of Philadelphia Police. As Zimring suggests, this reduction did not require “significant changes in either police personnel or functions”—just, apparently, changes in leadership

One good model for how to study the regulation of deadly force can be found in recent research on non-deadly force. The massive [Terrill et al (2012)](#bib70) study of the regulation of less-than-lethal force examined eight cities, comprised of five large cities (over 250,000) and three next-largest cities (150,000--248,000). While [Terrill and Paoline (2016)](#bib71) conclude from examining 3,340 use-of-force incidents in three of the large agencies that more restrictive policies appeared to reduce the use of force, their larger study found many nuances and contextual differences. Their multi-method approach of interviewing officers as well as reviewing citizen complaints and officer reports may also help to study fatal force. Most important, the heterogeneity of outcomes on different criteria serves to remind us that reducing fatal shootings may entail changes to other outcomes, such as police officers killed or injured, or general crime rates.

Perhaps a more direct approach to testing the effects of use of force policies is the [Bishopp et al. (2015)](#bib7) study of TASER deployment by 275 Dallas TX police officers who were already using TASERs. By coding 4,400 officer-months, they found that the raw percentage of arrests in which these officers used their TASERs on the suspect dropped from a peak of 20% under a permissive policy to a trough of 4% after a restrictive policy was introduced. By testing the effect *on weapon users* of restrictions on weapon use, they identified a causal mechanism for that subset of officers. In the context of shootings, the approach could compare new shooting regulations on both officers with and without prior histories of gun use. Yet the problems of eliminating rival hypotheses, such as regression to the mean, were limitations clearly identified by the authors ([Bishopp et al. 2015](#bib7)).

Preventative Imagination. Perhaps the greatest gap in post-Ferguson criminology is what might be called “preventative imagination.” It is one thing to say that policies should be more restrictive. It is quite another to say exactly what should be restricted, and how compliance with those restrictions should be achieved. In this arena, the President’s Task Force on 21st-Century Policing ([2015](#bib42)) summarized the statements and hypotheses of many criminologists, and is a rich source of ideas. But most proposals were broad visions for policing in general, not ideas aimed at police shootings in particular. One specific “shopping list” for less lethal policing proposed by [Zimring (2017](#bib78): 239--245 and Chapter 11) is by far the most focused. His four ways to save lives is a clear starting point: fewer shooting incidents, fewer bullets fired, immediate medical attention, immediate transportation to a trauma center. Yet what would bring these together is a more integrative theoretical perspective. Just having more rules and threats of punishment may not be enough to reduce deaths..

Missing in Action: Theory and Levers. Modern police research has long been plagued by an absence of evidence-based theory of police organizational behavior. Understanding how to change police agencies can only come from studying when they do or don’t change, and the many factors affecting such changes. [Sherman’s (1978)](#bib50) attempt to discern how systematic police corruption largely disappeared from Oakland (CA) in the 1950s and the NYPD in the 1970s (but not in two other agencies) is a possible starting point. By identifying the internal and external actors in major decision-making, the study pointed to the major “levers” that leaders could pull to change organizational behavior. Yet most of those levers were connected to threats and punishments---a focus continued by post-Ferguson criminology. The theory of deterrence on which those levers were constructed may have worked for controlling police corruption, and even less-than-lethal force. Given the risks officers face of losing their lives (not just illicit income) in relation to deadly force, a broader theory may be needed---especially one that can cause lasting change, not just short-term responses to temporary “crackdowns” ([Sherman 1990](#bib54)).

SYSTEMS CRASH PREVENTION AND FATAL POLICE SHOOTINGS

Perhaps the best theory that criminology can apply to reducing police shootings is not criminological, but organizational: one that helps to provide change in operational systems, not just to hold more individuals blameworthy. That is exactly the tension identified by [Perrow (1984)](#bib40) in observing how a wide range of organizations struggle with rare but catastrophic events that he describes as the inevitable “normal” (as in predictable) result of too much complexity in organizational systems. The term of art he chose for these events is “systems accidents,” emphasizing complexity rather than individual blame as the root cause of the catastrophes. Yet in recent years there has been a further tension in even using the word “accident” to describe car crashes or fatal high-rise fires (Richtel 2016), let alone fatal police shootings. Hence this essay proposes to adapt the concept of system accidents as “system crashes,” consistent with recent histories of the word “accident” as one developed by factory owners to avoid blame for injuries to workers caused by unsafe factory systems (Badger 2015). This trend suggests that the term “crash” is one that is more neutral as to a cause than the term “accident,” which implies that what happened is an act of God and not preventable by human agency.

So what does it mean to call police shootings “system crashess” and why does it matter? It matters because it signals a shift from a blame culture to a learning culture (Braithwaite 2005)). It means that we can study not only who, if anyone, was evil, but what processes went wrong and how we can fix them. To call police shootings “system crashess” helps to insulate the search for solutions from being consumed entirely by the urge to identify enemies. That insulation may open the door to calm reflection on the problem by all parties concerned.

That is not to say that no one is responsible for the many unnecessary police shootings. As Braithwaite (1989, 2005) suggests, it is important to confront individuals and organizations with the harm that their conduct causes. But it is equally important to do it in a way that allows them to express remorse and seek redemption by launching a new course of action. [Braithwaite’s (2005](#bib9): 283) graphic model is



But the success of such confrontations depends on the emotional content of the language the confronters employ. [Makkai and Braithwaite (1994)](#bib33), for example, show that the language regulators use to confront nursing home administrators with their organizational failures is a strong predictor of whether harm caused to resident patients declines by the next inspection. Any confrontation with a person being held accountable for harm can easily come across as a statement that “you are a bad person” rather than that “we know you are a good person, but your actions are harmful and we must learn together how to stop them” (Collins 2004; Rossner 2013). The “bad person” narrative only seemed to worsen organizational performance of the nursing homes, whereas the “learn together” narrative predicted improvements in performance. That is why it is worth trying to shift national and local dialogue on police shootings from blame to learning.

The central point Perrow (1984) made in defining the concept of “system accidents” is that the urge to blame individuals often obstructs the search for organizational solutions. If a system crashes s perspective can help to build a consensus that *many* dimensions of police systems need to be changed to reduce unnecessary deaths (not just, but certainly including, the firing or prosecuting the shooting officers), police and their constituencies could start a dialogue over the details of *which* changes to make. That dialogue could begin by describing Perrow’s central hypothesis: that the *interactive complexity* of modern systems is the main target for reform. From the 1979 nuclear power plant near-meltdown at Three Mile Island in Pennsylvania to airplane and shipping accidents, Perrow shows how the postincident reviews rarely identify the true culprit: the complexity of the high-risk systems that causes extreme harm.

[Perrow (2012)](#bib41) defines *system accidents* as events that happen while “everyone tries very hard to play safe, but unexpected interaction of two or more failures (because of interactive complexity) causes a cascade of failures (because of tight coupling). "These failures may often be harmless, alone or even in combination. But they can become catastrophic if they occur in a context that cannot be isolated from other ongoing processes.” Perrow labels that context as “tight coupling,” a system in a state of little slack created by “production pressures” to keep the system running constantly at top speed. Such pressures are certainly familiar to police: recall the Coroner of Victoria complaining about undue police haste as a cause of needless shootings ([Saligari & Evans 2015](#bib47)).

Perrow suggests that any system that is complexly interactive and tightly coupled will inevitably produce some regular occurrence of system accidents, which then makes them “normal” for that system. Missile launches, for example, engage systems with interactive complexity and tight coupling. The long-term rate of missile launch failures is 5% or greater ([Masunaga 2016](#bib34)). Yet Perrow focuses on system accidents with much lower frequency rates and even more catastrophic consequences.

Interactive Complexity

One key example [Perrow (1984](#bib40): 148) offers is a 1981 airway accident at Orange County Airport in California. At 1500 takeoffs and landings per day, it was the fourth busiest airport in the country in 1980; it also mixed the private planes with the much faster commercial aircraft. One day while an Air Traffic Controller was juggling three private and three commercial planes, he cleared plane Y for takeoff and plane X for landing. When he noticed the distance between the two planes was too close, he told plane X to abort the landing and Y to abort the takeoff. Both were too slow to comply. Plane X’s pilot raised his landing gear but could not pull the plane up, so the pilot decided to land anyway. But he failed to lock the wheels. The wheels of plane X tore off on impact, taking the wings and engines with them. The plane skidded, stopped and burst into flames. Four people were seriously injured, but all were evacuated before the plane exploded.

The multiple failures of *interactive complexity* in this airport case were 1) the Controller clearing two planes to use the same air space with much less separation than the recommended 6,000 feet; 2) pilot X acting too slowly to pull up and go around; 3) pilot Y acting too slowly to get off the runway; 4) pilot X deciding he had to land, but not locking the landing gear. The *tight coupling* was the proximity of six planes all competing for air space and dependent on a perfect juggling act by the Controller. There was no slack in the system that could buy more time or patience for the planes to go elsewhere.

The extensive details of the event documented by the National Transportation Safety Board led it to place most of the blame on Pilot X, with some for the Controller and Pilot Y. But [Perrow (1984](#bib40): 151--152) concluded that

“There is blame enough for everybody, suggesting that the system is at fault….We could also fault the Orange County supervisors…They allowed an airport of this small size to be used to handle all of the private planes of their wealthy county residents and also to provide commercial flights…Most importantly, we can fault a complexly interactive and quite tightly coupled system that attempts to work at the maximum limits of safety.”

The good news in Perrow’s analysis is that some kinds of systems (like air travel) begin with high rates of accidents, but accident rates are then lowered by redesigning the systems to reduce their interactive complexity. Airways safety is a particular success story, in which “experience, better designs, equipment, and procedures appeared, …the unsuspected interactions were avoided and the tight coupling reduced.” ([Perrow 1984](#bib40):5). The bad news is that for some other kinds of systems, attempts to fix these problems either fail or make things worse. Perrow defines those systems as having organizational structures that have major contradictions, using technological solutions that only increase interactive complexity and tighten the coupling.

Which type of system is policing? The answer may depend on how well police innovators can apply these concepts. What follows is a first attempt to suggest some applications of Perrow’s framework.

*Interactive complexity with citizens* in policing arises whenever police face citizens who do not comply with police orders---just as when the pilots in California failed to comply with the Air Traffic Controller’s orders. There are myriad ways in which people can fail to obey police orders, which makes the next steps of those people “unexpected”--or at least difficult to predict with certainty. The diverse ways people can defy police authority vary on a continuum of conduct that may appear more or less threatening to the safety of police and bystanders. What also varies, as generations of systematic observation has shown ([Sherman 1980](#bib51); [Engel et al. 2000](#bib14)), is the conduct of police officers in response to noncompliance: their discretion to use force, make arrests, call for backup, and let suspects run away to catch them on another day. A graphic model might look like this:



The two variables of citizen noncompliance and officer discretion are central to the (still untested) idea of “de-escalation” training, giving police skills in how to calm people down when they are upset. Using such skills may be a kind of emergency brake against police anger (or fear) escalating in response to citizen anger---a dynamic many observers see in events leading up to police shootings that may have been avoidable.

Tight Coupling and Production Pressures

Two kinds of production pressures are familiar to policing, both of which cause tight coupling. One is any production pressure to finish the present task in order to attend to the next task. The other is any production pressure to insure that the present situation is “contained” and does not spill over to affect more people, or even escalate to an injury to police themselves. Both forms of pressure create a sense of urgency in police work, and work against a strategy of patient de-escalation.

**Pressure to move on**makes police work not unlike landing airplanes on an aircraft carrier: there is usually another plane waiting its turn to land after this landing is finished. Police dealing with any kind of incident are highly conscious of the need to complete their task so that another task can be addressed very soon thereafter. The pressure to keep up production, if only to be available for a new dispatch, can create an organizational contradiction between doing the present task well and getting it over with as soon as possible. Every time police officers arrive at a location where there has been a request for police service, they hear a cry for help ringing in their ears---but not necessarily from the people at the *present* location. They hear their own counterfactual question of “*what else should I be doing now* that could be more important than this petty job?” This nagging worry feeds their impatience with the case at hand. It puts police in a constant state of triaging their time, always wondering whether they should be helping colleagues at another location. The result is a dominant occupational culture theme of police work best described as *urgency:* a strong sense of duty to a) finish each task, in order to b) resume readiness to provide immediate assistance elsewhere to those who need it most, wherever they may be.

**Pressure to Contain Risk.** A different kind of time pressure may be unique to police encounters with citizens who appear dangerous. This pressure, as a logical extension of Perrow’s concept of tight coupling and production pressures, may be called *pressure to contain risk.* This time pressure arises from the tight coupling between the behavior of noncompliant people and the potential for that behavior to harm police or others. If police do not terminate the behavior immediately, then that behavior may spill over from its current nonthreatening state to cause actual damage. That is the reason given for the many cases in which police shoot people who brandish knives when they fail to drop the knives immediately on command. Yet that is exactly what Camden Police addressed in the incident described below ([Goldstein 2017](#bib24)) when they formed a cordon around a knife-wielding man: their tactic “uncoupled” the behavior of the man from its potential for hurting bystanders, as well as from hurting police. More precisely, police “loosened” the coupling between his behavior and its possible impact by imposing themselves as a human shield that bought time for further negotiation.

Unless tight coupling is diagnosed and addressed, it can be just as dangerous in policing as in aircraft landings. When citizens are noncompliant, police may rightly say they “do not have all day.” Shooting people certainly takes less time than arresting them without injury. Yet given the potentially catastrophic costs of speed, a safer system would make it possible for police to do just that: wait all day, if that is what it takes to avoid a lethal confrontation.

Police officers already have different opinions about this issue, as revealed in dramatic incidents. When a homeless man chased a police officer around Lafayette Park in front of the White House in 1994, he had a knife taped to his hand. The officer called for backup, and five officers formed a semicircle with guns pointed at the man. While he refused orders to drop the knife, he stood still looking at police. Other police cleared bystanders away, and the standoff continued for several minutes. Then a siren was heard as another police car drove up near the scene. A US Park Police officer emerged, ran over to the other officers already dealing with the man, and immediately shot the homeless man twice. The man died in hospital ([Scull 1994](#bib49)). The police officer was not prosecuted, but most of the other officers present had *not* deemed it necessary to kill the man. This difference suggests not just production pressures, but a further system problem of excessive decentralization, in which no one is in command at the scene of a life-or-death standoff ([Reiss 1980](#bib44)).

How Rare And Catastrophic Are Fatal Police Shootings?

One objection Perrow could make to applying his framework to police shootings is that they are neither rare enough nor sufficiently catastrophic. For any single police department, however---especially in small communities---a fatal police shooting is likely to be extremely rare as a proportion of all citizen contacts. It is certain to be catastrophic for the persons shot and their families, not to mention the police officers involved. Some readers, however, may challenge the claim that police shootings are rare, so let us consider whether they are rare enough for systems accident theory.

Using the Washington Post estimate of just under 1000 fatal police shootings in the US per year in 2015, 16 and 17, we can estimate a rate in several ways. On a per capita basis, 320 million people have a 1 in 320,000 chance of being fatally shot by police each year. Since most people never have any direct contact with police, however, it seems more relevant to base a shooting rate on the number of police encounters. Arrests may seem more relevant, but there are many cases of people being killed in situations in which there was no probable cause to make an arrest: Amadou Diallo, for example, was shot (by mistake) on his doorstep.

Estimating total encounters from both reactive and proactive contacts is not easy, but one estimate comes from the US Bureau of Justice Statistics. That agency conducts the annual National Criminal Victimization Survey of US residents, and supplements the survey every three years with a Police-Public Contacts Survey (PPCS) limited to face-to-face contacts, excluding telephone and other contacts. The 2008 PPCS ([Eith and Durose 2011](#bib13)) is the latest detailed report to provide information on the number of contacts each respondent has. Using the percent of respondents who had one versus two or more contacts leading to a mean of 1.7 contacts per person who had a police contact (Table 7), we can estimate conservatively the number of contacts by multiply 1.7 X the 40 million who had any contact at all = 68 million contacts. On that basis, we can estimate the risk of any resident being shot fatally in a police encounter is one in 68,000.

In terms of the number of police officers, the Presidential Task Force ([2015](#bib42)) estimated the number of US police at 1.13 million. Thus the rate at which police shoot people fatally each year is 1 in 113,000 police officers. Put another way, the average officer would have to work 113,000 years to be expected, on average, to shoot someone fatally. From the standpoint of 18,000 police agencies, the mean would be one fatal shooting every six years, with many if not most agencies having never killed anyone.

So how rare is “rare,” in terms of Perrow’s systems accident theory? It is clear from [Perrow (1984)](#bib40) that different organizations have different rates of failure, from missile-launching (high) to plane-landing (low). The estimates we have for fatal police shootings are certainly within those ranges.

As for the catastrophic character of a fatal police shooting, [Zimring’s (2017](#bib78): 132) analysis suggests that big police agencies can shrug these cases off, with one estimate of civil litigation costs at a mean of $38,750 per case in Los Angeles. Yet many police shootings are likely to generate an intense dialogue over who is to be blamed. For officers who experience the aftermath of a fatal shooting, the qualitative evidence suggests it is a highly traumatic experience ([Van Maanen 1980](#bib73)). Certainly those who are charged with murder manifest high levels of impact, even if they are acquitted ([Furber & Smith 2017](#bib17)). The consequences on public trust in the police agency can also be devastating; [Skogan (2006)](#bib61) demonstrates with survey data that one bad event can outweigh many good deeds. Even bad publicity about police conduct in another city may depress crime reporting to police in African-American neighborhoods in Milwaukee ([Desmond et al. 2016](#bib11)).

Seen from a broad perspective on police organizations in relation to their environments, fatal police shootings seem appropriate for analysis with a theory of rare organizational catastrophes. But other considerations remain: whether it is correct to call them “accidents” (probably not) and whether they can be prevented better by focusing on failures of complex systems rather than on individuals. One answer to the latter question is found in a comparison of two police agencies dealing with a reportedly armed suspect, of which one police agency (Camden) had adopted a well-developed systems crash prevention strategy.

: Cleveland versus Camden

A TALE OF TWO POLICING SYSTEMS: CLEVELAND VS. CAMDEN

The key concepts of Perrow’s systems accident framework can be illustrated in the contrast between two incidents. One is the tragic killing of Tamir Rice, a 12-year old boy in Cleveland OH. The other is an “averted shooting” of a man with a knife in Camden NJ, whose life was saved by the construction of a system that reduced the “hurry-up” production pressures on front-line police officers.

Cleveland. On November 22, 2014, a 12-year-old African-American boy named Tamir Rice was shot to death in Cleveland by a 26-year-old white police officer named Timothy Loehmann. At the time of the shooting, Loehmann’s only information was that a “male black” had been sitting on a swing and pointing a pistol at people in a city park. A CCTV video shows a police car driving quickly right up to Rice (within two feet), Loehmann jumping out and shooting Rice once in the torso, then running around to the back of the police car as if to take cover.

The shooting may not have happened if any one of the following facts not been true:

1. The caller who notified police told the police call-taker that Rice’s pistol was “probably fake,” but the dispatcher did not tell the police officers assigned to respond to the scene.
2. The caller told the dispatcher the male with the gun was “probably a juvenile,” but the dispatcher did not tell the police of that statement; Rice was wearing a thick parka coat and weighed 195 pounds, so may have appeared to be an adult.
3. The police officer who shot Rice had been asked to resign from the first police agency he had worked for, only a month out of the Police Academy; the Independence, Ohio (population 7,000) had deemed Loehmann too emotionally unstable for police work, a fact he did not disclose on the application form for employment in the Cleveland Ohio (population 390,000) Police Department.
4. The Cleveland Police did not contact the Independence Police to obtain details about Loehmann’s previous performance.
5. The pellet gun Rice was holding was manufactured with an orange marker to indicate that it was not a real gun; the orange marker was missing at the time Rice was holding it.
6. Neither police officer administered first aid to Rice after he was shot.

Both the dispatcher and Officer Loehmann were fired; the dispatcher for not relaying crucial information to the officers, and Loehmann for not “fully” disclosing the reason he had left the Independence Police.

As the county prosecutor described this case, it was a “perfect storm” of “human error, mistakes and communications by all involved that day” ([CNN 2015](#bib10)). In other words, it was a “systems accident.

Camden. The multiple systems factors connected to the killing of Tamir Rice can be contrasted with the multiple factors that restrained Camden, New Jersey police from killing an unidentified man in late 2015, when they responded to a report of a man with a knife in a restaurant ([Goldstein 2017](#bib24)). Not one, but over 15 officers did exactly what Chief J. Scott Thomson had trained them to do under what the New York Times called his “Hippocratic ethos of policing: Minimize harm, and try to save lives” ([Goldstein 2017](#bib24)):

Officers are trained to hold their fire when possible, especially when confronting people wielding knives and showing signs of mental illness, and to engage them in conversation when commands of “drop the knife” don’t work. This sometimes requires backing up to a safer distance. Or relying on *patience* rather than anything on an officer’s gun belt. [italics added]. ([Goldstein 2017](#bib24))

In the Camden restaurant incident, the *New York Times* reported that

a 48-year-old man walked into a Crown Fried Chicken, behaved menacingly toward customers and employees, brandished a steak knife and left. Outside, officers ordered him to drop the knife, according to video from police body cameras. But the man began walking away, slashing the knife through the air as he went.

For several minutes, the officers formed a cordon around the man and walked with him for a few blocks, trying to clear traffic ahead and periodically instructing him to drop the knife. The crisis ended when the man did just that. ([Goldstein 2017](#bib24)).

The stunning video the *Times* described shows a more complex story ([YouTube 2015](#bib76)): for at least seven minutes, up to 15 police officers and two police cars created a ring around the man while he continued to slash the air with his knife and walk at a rapid pace (see Figure 4). At least one officer had a TASER, but the man was walking too fast for the stun gun’s electrified darts to penetrate the man’s clothing. They continued to walk with him for up to six minutes until the officer with the TASER could get close enough to fire the nonlethal darts, which knocked the man to the ground. He was immediately handcuffed and apparently uninjured.

Figure 4 Camden police cordon around a man with a knife (2015)

The Times also reported that

Had the episode taken place a year before, “we would more than likely have deployed deadly force and moved on,” Chief Thomson said. The chief said he had stressed to his officers that the department “does not treat repositioning as retreating,” and that *backing up to put a car between a suspect and an officer “is not an act of cowardice*.” [italics added]. ([Goldstein 2017](#bib24)).

Note that this case does not require the re-engineering of an entire police agency. All it required was a focus on patience. What Camden did can arguably be attempted in any police agency of any size in the US, until research falsifies that hypothesis. It should work because, theoretically, it illustrates the linkage between dealing with a knife-wielding man and everything else that is going on in Camden at the same time. The clear directive to give priority to containing this risk without deadly force made that connection for the officers, so they did not have to do it by themselves. As [Sampson, Winship and Knight (2013](#bib48): 610) observed,

“A key strength of our recommended approach is that to understand whether a particular causal effect is identified, *we do not need to estimate the whole system*. What we do need to do is to draw on theory to gain an understanding of how parts of the system are stitched together.”

Chief Scott stitched the parts together.

A RESEARCH AGENDA FOR PREVENTING POLICE SHOOTINGS

Any research agenda for saving lives must start with the question of whether police systems were even designed to save the lives of people who police shoot. The evidence suggests the systems were not so designed. As [Zimring (2017](#bib78): 228--231) points out, the number of people who die from police shootings is proximately determined by at least four successive decision points, all occurring closely in time:

1. Whether police will shoot at all
2. When to stop shooting (and after how many bullets shot)
3. What medical care police themselves will render immediately to all persons they shoot
4. Whether police cars will immediately transport to a hospital persons shot by police, rather than waiting for an ambulance or Emergency Medical Technician to arrive

The fact that most of the 18,000 US police agencies appear to have no clear policies on decision points 2, 3 and 4 speaks volumes about the lack of design for the organizational behavior affecting the fatality rate outcomes of police shootings. At minimum, it suggests that systems design for saving lives is incomplete. Most shootings do not result in death (Meyer 1980). The fastest way to reduce fatal shootings may be to increase life-saving first aid after each shooting occurs.

The evidence is clearest in relation to missing policies on first aid for people police shoot. Many lives can be saved by applying battlefield-grade haemostatic bandages to people who have just been shot ([Rhee et al. 2008](#bib45)), but officers cannot be expected to apply those bandages if the department does not issue them along with police weapons. Officers can save lives of severely injured gunshot wound victims if they place wounded persons in their police cars for immediate transport to the hospital ([Band et al. 2014](#bib4)), but they may be barred from doing so unless they have been trained and authorized.

Officers are also unlikely to know how to decide when enough bullets have been fired unless they are trained to make that decision on clear principles. Blaming individual officers for failing to make the right “split second decisions” on such policies would clearly be wrong. Yet many deaths might never occur if police organizations had better policies on all four decision points Zimring raises. Those policies, in turn, must be designed not in isolation from other dimensions of a policing system, but rather in full light of the coupling and interactions with all relevant dimensions---from training to supervision to dispatchers to health care systems.

A research agenda informed by systems accident theory might well distinguish between innovations that add new features designed to save lives, such as medical care or “cease fire protocols,” and innovations that protect core functions of policing when the risk of a lethal confrontation is encountered (as in question 1: when to shoot at all).

Starting with the core functions issues, criminologists could address the following questions

1. *can production pressures on police to act “quickly” can be reduced to slow down decision-making in every citizen encounter*---*thus leaving time to avoid a “split-second decision” (*[Fyfe, 1986](#bib20)*)?* This question could be addressed by attempting to replicate the Camden system in a series of Level 2 impact evaluations (Sherman et al. 1997**[\*\*AU: Reference not found in the Lits Cited. Please add there or remove here\*\*]**), comparable to those used by [Fyfe (1978)](#bib18), [Sherman (1983)](#bib53), [Geller and Scott (1992](#bib22)) and [White (2001)](#bib74).
2. *what do so many officers or police chiefs do to avoid shooting people despite legally sufficient provocation and justification (“averted shootings”), and how can we find links to other parts of the system that may inhibit their success?*

This question could be addressed by reviewing police arrest reports to identify officers who were directly threatened but did not shoot, along the lines of research by [Winship (in progress)](#bib77).

1. *do police records show some police officers to be predictably more at risk than others of shooting illegally or unnecessarily--so that evidence-based decisions could be made to remove them from street encounters with civilians?*

No prediction studies appear to have been done based on the prior performance histories of police officers using the methods pioneered by Berk et al. (2009) **[\*\*AU: Reference not found in the Lits Cited. Please add there or remove here\*\*]**. Such studies can be done easily in large police agencies with modern information technology, but with greater difficulty in smaller agencies absent a state-wide data base. Related research could look at the prevalence of shooting by officers who have been dismissed from other police agencies, a key issue in whether a license to practice policing (as is required in Florida) could reduce shootings by banning officers who lose their license from re-employment as police officers in the state.

1. *do certain kinds of training raise the risk of avoidable shootings*---*so that such training can be discontinued in favor content that saves more lives?*

This question can be addressed with natural experiments comparing trainee cohorts receiving different kinds of police training. The shooting behavior of officers trained by an explicitly designed and new “life-saving for all” training program, for example, could be compared to that of police officers trained by previous programs.

1. *can on-the-scene protocols safely divert authority to shoot civilians from officers to supervisors (as in high-speed chases)?*

One feature of system accident theory is an extensive review of centralization versus decentralization of authority relevant to crises ([Perrow 1984](#bib40): 330--339). In a world in which supervisors could not monitor police actions from afar, it has been very difficult to insert supervisors into situations as soon as police pull out their guns. Yet technology has progressed rapidly since 1984, and now such insertion is possible. As more police go to work each day wearing body-worn video cameras, it is becoming possible to consider electronic on-site supervision from afar that can be switched on in a few seconds. Even without such technology, there is a long precedent in control room supervision by radio for another high-risk-of-systems accident scenario: the high-speed chase. As [Reiss (1980)](#bib44) suggested long before body-cameras, there is every reason to include the concept of centralized decision-making as a tool for trying to increase the avoidability of shoot-don’t shoot confrontations.

1. *can organizational incentives offered to encourage delay and de-escalation (“bring-them-back alive” medals) help to reduce avoidable shootings?*

A comprehensive documentary by [American Public Media (2017)](#bib3) reports that medals for “de-escalation are now given to Los Angeles and Philadelphia Police. A national study of shooting rates before and after these medals are introduced (or discontinued) could shed some light on the possible casual mechanisms they may create.

Moving into “systems designs to save lives,” criminologists could also work with police agencies to answer these questions:

1. *can “cease-fire” protocols limit the number of bullets fired by police under clear circumstances?*

This recommendation from [Zimring (2017)](#bib78) may be the most difficult to develop. At minimum, it would likely require a committee of field and training officers who might agree on certain principles that could be introduced when none are available.

1. *how many lives can be saved by police applying haemostatic bandages to civilians immediately after police have shot them?*

A Cambridge University study in Trinidad is in progress on this question. The major result so far is that officers do not want to apply bandages to people they shoot. The research may need to start with a discussion of what it may take to implement a policy of this kind.

1. *how many lives can be saved by requiring police to drive wounded civilians in police cars to hospitals as soon as they have received first aid?*

The evidence from Philadelphia ([Band et al. 2014](#bib4)), which launched this policy in the 1990s, is that among 4,121 trauma patients with 27% mortality rate, gunshot wound victims transported immediately to hospital by police had a 30% lower mortality rate than those whose transportation was by ambulance with EMS staff. This suggestive finding could be tested in a controlled experiment among a randomly selected group of patrol officers in high-gunshot areas, comparing mortality rates to patients who did not encounter the experimental group officers.

1. *should every accidental or intentional gunshot wound caused by a police officer be subject to a peer review process located outside of the shooter’s organizational unit?*

[Fyfe (1978)](#bib18) offered a detailed implementation analysis of the new Firearms Discharge Review Board (FDRB) in New York, which required police officers who fire their guns to meet in person with a committee of senior officers to discuss each decision to shoot. The FDRB created a new learning process for the entire department, focused on training officers, changing training systems, adapting general policies, and improving supervision, *as well as* increasing a deterrent threat of dismissal for violating restrictive rules on police using firearms. Because the *context* of creating an FDRB would be vastly different in a police agency of 30 officers than in the 30,000 or more of the NYPD, this strategy could be tested at a state-wide level in states that have many small police agencies.

1. *can police leaders build more community trust after shootings by various statements of regret or efforts at reconciliation?*

One possible research project would be to recruit police chiefs to invite families of shooting victims to meet privately with them---but not with the shooting officers--in face-to-face restorative justice conferences (RJCs). The chiefs would accept responsibility for having caused harm, and talk with the families about how they might try to prevent the harm in future. While JamesBueermann (personal communication 2017 notes that his own attempt to do this as a California Chief of Police encountered objections from the Redlands city attorney, there are states that have statutes preventing any such conversations with *doctors* from being used in civil litigation over compensation. The same may be possible with police shootings---another possible benefit of discussing them as systems accidents.[[4]](#footnote-4)

CONCLUSION

This review essay offers two frameworks, but with unequal development: systems crash prevention (from Perrow 1984) and contextual policy development (Sampson, Winship and Knight 2013). The systems crash prevention framework is presented in greater depth, since it changes the nature of the discussion about developing policies to save lives. Yet the contextual policy development framwork is equally important, since it must be deployed to encompass the vast array of police departments.

The central obstacle to research and devlopment for the majority of fatal police shootings is the vast decentralization of US police agencies. Any attempt to reduce fatal police shootings would be better targeted on those agencies, via state legislatures and their police training boards. Foremost among the ideas that could e developed is inter-agency cooperation: ways in which smaller agencies can share specialist expertise for hostage negotiations or seige situations, either with other small agencies, state police, or nearby large cities.

It is often reported in England, for example, that a three-agency team of firearms specialists respond quickly to a seige situation, using specialist skills for which they train together many days a year. Unlike a weapons-focused team, the UK approach is focused on contact-avoidance with armed suspects, much like the Camden New Jersey Police (Davies 2017). The same specialist firearms skills are used across the 43 police forces in England, with all qualified officers undergoing the same specialist training. The National Police Chiefs’ Council of England and Wales make every effort to promote inter-operability. For some US states, and some US police agencies, this might be a feasible approach to support in terms of state legislation and funding.

Yet the lesson of the contextual differnces framework (Sampson, Winship and Knight 2013) is that what works some places, or for some people, or in some organizations, may not work in others. Rather than seeking simple or single solutions to a manifestly complex issue, the next generation of criminology for fatal shootings might have better success with a variety of solutions. The similarities of big cities have long attracted criminologsists to the common causes of crime and justice problems in those cities. Yet the concentration of fatal police shootings in smaller communities requires criminologists to pay more attention to small cities and towns. Foundations and federal funders should recognize the challenge this poses, and provide extra incentives for research and development aimed at contextual diversity, rather than highly generalizable policies.

This approach, while difficult, is consistent with a great tradition in American criminology: its long history of studying life and death. From Sellin’s early studies of the death penalty to the outpouring of modern homicide studies, mortality is rightly a major concern for criminologists. Yet until Ferguson and the advent of crowd-sourced death counts, police shootings have not been central to criminology. As this review essay shows, there is no reason to keep fatal police shootings on the periphery of criminology, let alone to keep criminology marginal to police shooting issues. The need for a new generation of police scholars has never been greater. There is much work to do on both theory and research on the state’s monopoly of legitimate use of force. Perhaps future volumes of this Annual Review series will be able to record its progress.

DISCLOSURE STATEMENT

The author does not presently have any affiliations, memberships, or financial holdings that might be perceived as affecting the objectivity of this review. From 1977 through 2012, the author occasionally and intermittently served as a paid and unpaid advisor to attorneys on all sides of court cases concerning misuse of deadly force, including those prosecuting police officers, litigating claims against police agencies, and defending police officers or agencies, but decided in 2012 permanently to end the provision of such advice.

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1. a social movement producing major change in moral or spiritual consensus; see [Ahlstrom 1972](#bib1). [↑](#footnote-ref-1)
2. https://www.theguardian.com/us-news/ng-interactive/2015/jun/01/the-counted-police-killings-us-database. [↑](#footnote-ref-2)
3. https://www.washingtonpost.com/graphics/national/police-shootings/. This reviews focuses on fatal shootings, rather than all deaths, in order to reduce the heterogeneity of the phenomena to be understood and prevented, which requires excluding deaths in custody, choke-holds, TASERs and other situations with different causal processes from shootings. [↑](#footnote-ref-3)
4. The idea of RJCs about fatal police shootings would have a relevant precedent in Montgomery Alabama, where police failed to protect a Freedom Rider civil rights group from beatings by a white mob in 1961. Five decades later, Montgomery Police Department Chief Kevin Murphy took an opportunity to apologize for this harm on behalf of his police agency. ([NBC News, 2013](#bib38)). The apology was something Chief Murphy had planned to do since his first days as a Montgomery police officer decades after the mob attack. The apology was delivered on camera ([YouTube 2013](#bib75)) to Congressman John Lewis of Atlanta, who had marched with the Rev. Dr. Martin Luther King in Montgomery. [↑](#footnote-ref-4)