MOVING FORWARD WITH EVIDENCE-BASED POLICING: WHAT SHOULD POLICE BE DOING AND CAN WE GET THEM TO DO IT?

by

Cody W. Telep
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Date: _____ Spring Semester 2013
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DEDICATION

To Darcy Lewis and Daniel Schwei, for your constant encouragement, support, and friendship on the long, strange journey that is graduate school.

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LIST OF ABBREVIATIONS

American Society of Criminology ..... ASC
Automated vehicle locator ..... AVL
Bureau of Justice Assistance ..... BJA
Bureau of Justice Statistics ..... BJS
Closed circuit television ..... CCTV
Center for Evidence-Based Crime Policy ..... CEBCP
Calls for service ..... CFS
Confidence interval CI
Office of Community Oriented Policing Services ..... COPS
Drug Abuse Resistance Education ..... D.A.R.E.
Drug Market Initiative ..... DMI
Driving while intoxicated ..... DWI
International Association of Chiefs of Police ..... IACP
Inter-university Consortium for Political and Social Research ..... ICPSR
Law Enforcement Management and Administrative Statistics ..... LEMAS
License plate recognition ..... LPR
National Institute of Justice ..... NIJ
National Policing Improvement Agency ..... NPIA
National Research Council ..... NRC
Office of Justice Programs ..... OJP
Police Executive Research Forum ..... PERF
Problem-oriented policing ..... POP
Richmond Police Department ..... RPD
Scanning, analysis, response, assessment ..... SARA
Standard deviation ..... SD
Sacramento Police Department ..... SPD
Stop, question, and frisk ..... SQF
Systematic social observation ..... SSO
Uniform Crime Report ..... UCR

ABSTRACT

MOVING FORWARD WITH EVIDENCE-BASED POLICING: WHAT SHOULD POLICE BE DOING AND CAN WE GET THEM TO DO IT?

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George Mason University, 2013

Dissertation Director: Dr. David Weisburd

This dissertation by articles is focused on moving forward with evidence-based policing, concentrating in particular on the tactics officers should be engaging in to reduce crime and disorder most effectively. Three important questions in moving forward are discussed in detail. The first is what exactly does the research evidence suggest police should be doing? Specifically, the dissertation focuses on drawing lessons for police on how they should be implementing strategies that have proven to be effective in rigorous evaluation studies. Drawing out these lessons is potentially one way of making research more digestible and usable for police agencies. This review of what the police should (and should not) be doing draws upon both primary studies and systematic reviews of the policing literature. A second key question is what does evidence-based policing look like in action? Can agencies successfully use the lessons gleaned from prior research to design and evaluate evidence-based approaches to crime control? An evaluation of a hot

spots policing experiment in Sacramento, California, suggests that policing interventions using specific tactics guided by prior research can be successful in reducing overall calls for service and crime incidents. The Sacramento study is particularly useful to include in this dissertation because the experiment was undertaken with existing departmental resources and with only limited consultation with researchers. The police department took the initiative to design and implement a strategy based on scientific evidence about what works best, suggesting a model for moving forward in evidence-based policing. A third and final question is what challenges exist in moving forward? The primary challenge considered in this dissertation surrounds officer receptivity to research and evidence-based policing. That is, do officers have an understanding of what works in policing, and are they willing to be innovative and evaluate the effectiveness of their tactics and strategies? Survey responses from officers in the Sacramento Police Department and the Richmond Police Department suggest some of the prospects and challenges that exist in trying to institutionalize the use of science to guide departmental practice. The dissertation concludes with a discussion of issues in increasing research utilization in policing and needed future research on evidence-based policing.

CHAPTER ONE: INTRODUCTION

In 1998, Lawrence Sherman began his Ideas in American Policing lecture by arguing, "Of all the ideas in policing, one stands out as the most powerful force for change: police practices should be based on scientific evidence about what works best" (2). To an outsider, the statement might sound too obvious to warrant an entire lecture. Why would police practices be based on something other than evidence about what works best? This is often the same reaction those unfamiliar with criminal justice research and policy give when they hear about the Center for Evidence-Based Crime Policy at George Mason University. They often jokingly ask, "Is there something other than evidence-based crime policy?" They fail to recognize that non-evidence based crime policy is generally the norm (see Welsh & Farrington, 2011).

Researchers studying the police, however, understood that Sherman's (1998) message was quite revolutionary (see also Welsh, 2006). For Sherman (1998), evidence-based policing meant that police agencies should not only be using the best evaluation research to guide policy and practice, but also doing evaluation research in-house to assess if their efforts were contributing to crime declines. More recently, Weisburd and Neyroud (2011: 1) have advocated for a "radical reformation of the role of science in policing if policing is to become an arena of evidence-based policies." They call for a shift in the ownership of science from academics and universities to police agencies

themselves. They believe that making science a crucial part of the police mission will help make evidence-based policing more of a reality. While Sherman (1998) and Weisburd and Neyroud (2011) highlight a paradigm for shifting police practice, there remains the important question of what evidence-based policing should look like in practice. What are the strategies that scientific evidence suggests works best, and how can police agencies overcome challenges to implement these strategies? While much progress has been made in the last 15 years in both expanding the base of scientific evidence and in making police more evidence-based, there still remains a great deal of work to be done to realize Sherman's (1998: 4) vision of police using "the best evidence to shape the best practice."

This dissertation is focused on moving forward with evidence-based policing, concentrating in particular on the tactics officers should be engaging in to reduce crime and disorder most effectively. In the series of articles that follow, three important questions in moving forward will be discussed in more detail. The first is what exactly does the research evidence suggest police should be doing? In Sherman's (1998) terminology, what does the scientific evidence suggest works best? The goal here is not to simply repeat what has been written in previous reviews of what works in policing (e.g. Sherman & Eck, 2002; Weisburd & Eck, 2004). These reviews have been invaluable in synthesizing policing research, but have often focused more on simply listing effective and ineffective strategies. The contribution here is on drawing lessons for police on how specifically they should be implementing strategies that have proven to be effective in rigorous evaluation studies. Drawing out these lessons is potentially one

way of making research more digestible and usable for police agencies (see Lum et al., 2012). A listing of "what works," for example, may be insufficient to affect police practice; department leaders and officers may need more guidance on specific tactics and exactly how to implement effective approaches. Synthesizing rigorous research in ways that are accessible to police has not always been a strong suit of the research community. As former police chief Jim Bueermann (2012: 14) points out in regards to academics, "the responsibility for disseminating evidence-based police practices rests with the research community…If they want practitioners to use their findings, they must make their research easier to understand."

This review of what the police should (and should not be doing) draws upon both primary studies and systematic reviews of the policing literature. Systematic reviews, largely conducted by the Campbell Collaboration, are designed to comprehensively gather and analyze the most rigorous research on policing in order to provide guidance for researchers, policymakers, and practitioners on what does and does not work. The Campbell Collaboration Crime and Justice Coordinating Group is closely tied to the evidence-based movement in policing. The Campbell mission statement stresses, "Our mission is to promote positive social change, by contributing to better-informed decisions and better-quality public and private services around the world."[1] The Campbell process is intended to provide recommendations to improve policy and practice. A review of the reviews will thus be useful in assessing how systematic reviews to date can help police reach better-informed decisions.

[1] See http://www.campbellcollaboration.org/artman2/uploads/1/C2_GeneralBrochure_low_May09.pdf

A second key question is what does evidence-based policing look like in action? Can agencies successfully use the lessons gleaned from prior research to design and evaluate evidence-based approaches to crime control? An evaluation of a hot spots policing experiment in Sacramento, California, included as a chapter in this dissertation, suggests that policing interventions using specific tactics guided by prior research can be successful in reducing overall calls for service and crime incidents. The Sacramento study is particularly useful to include in this dissertation because the experiment was undertaken with existing departmental resources and with only limited consultation with researchers. The police department took the initiative to design and implement a strategy based on scientific evidence about what works best, suggesting a model for moving forward in evidence-based policing.

A third and final question is what challenges exist in moving forward? While providing more specific guidance on effective tactics and demonstrating how an agency can use research to guide practice are important, there are additional key issues to consider. The primary challenge considered in this dissertation surrounds officer receptivity to research and evidence-based policing. That is, do officers have an understanding of what works in policing and are they willing to be innovative and evaluate the effectiveness of their tactics and strategies? While the Sacramento experiment is an example of a successful introduction of research into practice, survey responses from officers in the Sacramento Police Department and the Richmond Police Department suggest some of the challenges that exist in trying to institutionalize the use of science to guide departmental practice.

Thinking more about specific ways police can implement effective approaches and be more evidence-based is thus the overall theme of the dissertation. This dissertation will address important questions surrounding evidence-based policing. How do we narrow the gap between research and current police practice? What do police need to be doing to move towards Sherman's (1998) model of evidence-based policing or Weisburd and Neyroud's (2011) call for the integration of science into policing? What can the police and researchers learn from one another to help make evidence-based policing more of a reality? This chapter will review the state of evidence-based policing before turning to more detailed descriptions of the chapters that follow. These descriptions will help demonstrate how this dissertation will address the three questions for moving forward described above.

Evidence-Based Policing: A Brief Introduction

The push towards more evidence-based policing parallels the evidence-based movement in other fields and sectors. Perhaps most prominently, the Obama administration has pushed for the importance of scientific evidence in the allocation of federal dollars (see Clear, 2010). In May 2012, for example, the Office of Management and Budget released a five-page memorandum[2] to all heads of executive departments and agencies requesting that agencies demonstrate the consideration of scientific evidence in their fiscal year 2014 budget requests. As the memo from Acting Director Jeffrey D.

[2] See http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-14.pdf

Zients notes, "Where evidence is strong, we should act on it. Where evidence is suggestive, we should consider it. Where evidence is weak, we should build the knowledge to support better decisions in the future." As Sherman (1998) alludes to, the field of medicine has also been prominent in the evidence-based movement in the last few decades (see Millenson, 1997). Guyatt and Busse (2006) describe changes in medicine in the 1990s in response to problems similar to those in policing described by Lum (2009): "In contrast, to the traditional paradigm of medical practice, EBM [evidence-based medicine] acknowledges intuition, unsystematic clinical experience, and pathological rationale are insufficient grounds for clinical decision making, and it stresses the examination of evidence from clinical research" (Guyatt & Busse, 2006: 26). Weisburd and Neyroud (2011) describe the recent push for evidence-based policy and decision making in the field of education. They note that "evidence-based science has grown exponentially in education" (Weisburd & Neyroud, 2011: 12) as federal funding for high-quality research has increased rapidly. The Institute of Education Sciences in the U.S. Department of Education was founded in 2002 to promote and provide rigorous education research and by fiscal year 2009 had a budget of $167 million for research, development, and dissemination with a fiscal year 2013 request of $202.3 million.[3] Unfortunately, as Weisburd and Neyroud (2011) point out, federal support for rigorous research in criminal justice has often lagged behind. Davies, Nutley, and Smith (2000) review the surge of interest in evidence-based policymaking in a number of fields including healthcare, education, and criminal justice, but also social welfare,

[3] See http://www2.ed.gov/about/overview/budget/budget13/summary/13summary.pdf

transportation, and housing. Mears and Barnes (2010: 702) point out that in recent years "the mantra of accountability and evidence-based policy or practice surfaced in nearly all areas of government."

While progress has been made in efforts to make the police more evidence-based, police practices are often not based on scientific evidence about what works best. Indeed, as Lum (2009) points out police practices are frequently not informed by any sort of scientific evidence at all. Instead, as Lum (2009: 3) describes, police practice is often based more on "anecdotes and stories, officers' experiences, political and social crises, standard operating procedures, moral panics, political ideology, pressure-group interests, police organizational, strategic, and tactical culture, and other whims, hunches, feelings, and best guesses." Weisburd and Neyroud (2011: 4) make a similar argument, noting that, "Today, as in past decades, strategies developed in police agencies are generally implemented with little reference to research evidence." Thus, as noted earlier, while there has been progress in recent years, policing is far from being an evidence-based enterprise. Kennedy (2010) also points out that police continue to use strategies with little evidence of effectiveness. He argues, "We have known from the 1970s that random patrol, rapid response, and reactive investigation do not prevent or control crime. We also know that they remain the central activities of police departments, usually, for all practical purposes, to the exclusion of all else" (Kennedy, 2010: 167). Mears (2007: 679) suggests that such problems exist in the entire criminal justice system. As he notes, "crime policy on the whole lacks a rational foundation in the sense of resting on an

evidence-based, evaluation research platform that would help ensure that it is effective and efficient."

A review of recent data from the Law Enforcement Management and Administrative Statistics survey conducted by the Bureau of Justice Statistics (LEMAS; Reaves, 2010) helps to reinforce the idea that progress has been made in efforts to make police practice more evidence-based, but much remains to be done. Crime analysis and crime mapping are very important for the successful implementation of hot spots policing, an evidence-based strategy discussed more below (see Lum, 2009). LEMAS results overall suggest widespread use of these technologies in larger departments but not in smaller ones.[4] For example, while over 90 percent of the largest agencies are using computers for hot spot identification, just 13 percent of departments overall are. Even in moderately sized cities (population 100,000-249,999), just 66 percent of departments use computers to identify hot spots. When it comes to using computers for crime analysis and crime mapping, results are similar. One hundred percent of the largest departments make use of computers for such tasks, but only 38 percent of agencies overall use computers for crime analysis, and 27 percent use computers for crime mapping.

The use of computers for crime mapping and analysis has increased since the 2003 LEMAS survey. For example the percentage of officers working in a department that uses computers for crime mapping jumped from 57 percent in 2003 to 75 percent in 2007 and for hot spot identification the increase was from 45 percent in 2003 to 58

[4] It is important to recognize that while LEMAS is one of the only available sources on police department policies and practices, there is currently no way of assessing the validity and veracity of police agency survey responses. It is also the case that there is no way of determining the extent to which agencies make use of these technologies (i.e. how much crime analysis are large agencies doing, and how frequently are they using crime mapping to identify hot spots?).

percent in 2007 (Reaves, 2010). Research by Weisburd and Lum (2005) suggests that the use of crime mapping diffused quickly across policing from the mid-1990s through 2001. They note that the adoption of crime mapping was closely linked to the use of hot spots policing. When agencies were asked why they developed crime mapping in the department, the largest response category was "to facilitate hot spots policing." These latest LEMAS data suggest that the use of crime mapping continues to increase, but smaller agencies are lagging behind.

One reason for growth in evidence-based policing is the increase in the number of studies police agencies can draw upon. The size of the evidence base for policing interventions focused on crime control has grown substantially in recent decades and particularly in recent years. This is not to suggest that evidence-based policing has matured to a level where there is sufficient knowledge in all areas to make strong recommendations about policy and practice, but there is a growing base of rigorous scientific research the police can use to guide decision making. For example, the Evidence-Based Policing Matrix, a research translation tool designed by Lum, Koper, and Telep (2011) currently includes 117 police interventions published from 1970 to 2011. These studies all met minimum rigor requirements of using a quasi-experimental design with a comparison group. To illustrate the recent growth in rigorous studies, 70 of these 117 studies, nearly 60 percent, came after Sherman's (1998) remarks. More than one in five studies in the Matrix has been published in the last five years.

Of course, just building the size of the evidence base is not enough for evidence-based policing to become a reality. It is also important that these interventions show

success in reducing crime and disorder. Recent years have seen a major shift in this area as traditional beliefs that police could not have a major effect on crime and disorder have been replaced with the view by most that the police can indeed play a role in reducing crime. In 1994, David Bayley began his book *The Future of Police* with the provocative statement, "The police do not prevent crime" (3). He continued, "This is one of the best-kept secrets of modern life. Experts know it, the police know it, but the public does not know it. Yet the police pretend that they are society's best defense against crime. This is a myth" (Bayley, 1994: 3). Gottfredson and Hirschi (1990: 270) similarly contended that police could do little to prevent and reduce crime, arguing that "no evidence exists that augmentation of police forces or equipment, differential patrol strategies, or differential intensities of surveillance have an effect on crime rates." These are not arguments from 50 years ago. Less than two decades ago, it was the belief of a leading police expert like David Bayley that the police could not be effective in reducing crime and disorder.

The Evidence-Based Policing Matrix tells quite a different story. Just over half of the studies show statistically significant findings in terms of crime reduction and an additional 15 percent show mixed findings, indicating at least some success. The percentage of studies showing significant crime reduction increases to close to 60 percent when looking just at the studies published from 1998 to 2011. And in certain areas, as discussed in more detail below and in chapters 2 and 3, the evidence is overwhelmingly positive. This more positive overall view of the policing evaluation literature has helped inform a new view of the ability of the police to address crime and disorder effectively. Telep and Weisburd (2012: 350, see chapter 2), for example, conclude in their recent

review that there are, “a number of areas where the evidence base is currently sufficient to make recommendations to police practitioners on strategies that can effectively reduce crime and disorder.” Similarly, the National Research Council (NRC, 2004) review notes that police can be effective when they approach crime in particular ways. The report concludes that, “There is very strong research evidence that the more focused and specific the strategies of the police, the more they are tailored to the problems they seek to address, the more effective police will be in controlling crime and disorder” (NRC, 2004: 251).

The current economic climate may make evidence-based policing an even more attractive option for cash-strapped police agencies. The economic downtown has led to layoffs and reduced budgets in departments across the country (see Office of Community Oriented Policing Services, 2011). Evidence-based policing offers the promise of using limited resources more efficiently and effectively by focusing on the strategies and tactics most likely to reduce crime. As Bueermann (2012: 12) notes, evidence-based policing is, “an approach to controlling crime and disorder that promises to be more effective and less expensive than the traditional response-driven models, which cities can no longer afford. With fewer resources available, it simply does not make sense for the police to pursue crime control strategies that science has proven ineffective.” Thus, one positive consequence of the recent recession may be that it forces agencies to consider being more evidence-based in the face of dwindling resources. Weisburd, Telep, and Lawton (in press) find that the New York City Police Department’s continued success in reducing crime despite declining numbers in total officers may come, at least in part, from

focusing stop, question, and frisk (SQF) activity in high crime areas. In this way, the police may have been able to do more with less, by concentrating intensive patrol activity in hot spots.[5]

Despite some reasons for optimism, a growing evidence base showing successful results does not mean that police agencies will necessarily adopt strategies that work. Crank and colleagues (2012) suggest that while research has suggested a number of avenues for making police more effective, these strategies and tactics have not been readily adopted:

> We have seen a large number of quite good innovations related to policing, innovations that contribute a great deal to the way police work can be improved. Indeed, if one were to survey the past 40+ years of research since the seminal "Kansas City Preventive Patrol Experiment," one would wonder if policing were even the same enterprise it was in the 1960s. However, were the same person to go into many police departments around the country, he would find far fewer differences. Beyond crime mapping, computer technology, and a slightly improved comfort level with minority and female police officers, anyone would be hard pressed to identify the differences over that past century (Crank et al., 2012: xx).

Others have made similar arguments. Sherman (1998) recognized that building the evidence base is an important part of the push towards evidence-based policing, but more evidence does not necessarily mean police are using that evidence. As he notes, "Evidence-based policing assumes that experiments alone are not enough. Putting research into practice requires just as much attention to implementation as it does to controlled evaluations" (Sherman, 1998: 7). Lum and colleagues (2011: 22) echo these

[5] SFQs are highly controversial in New York because of a concern that police are using these stops in discriminatory ways to racially profile young minority males. As Weisburd et al. (in press) note, the potential success of focusing SQFs in hot spots does not mean that this approach is the best way (or even a desirable way) to deal with high crime micro places.

recommendations from Sherman, arguing that, "Incorporating evidence into practice requires not only building upon the already-existing infrastructure for evidence-based approaches, but also creating a stronger capacity in agencies to implement effective interventions and to maintain the practice of evidence-based policing." Rigorous research on its own will not necessarily influence police practice. More attention must be given to how that research is presented and communicated to practitioners and how conditions in the department can be altered to generate an environment more favorable to the growth of evidence-based policing.

Lessons from evidence-based medicine are relevant to better understand why police agencies may be slow to adopt evidence-based strategies. Guyatt and Busse (2006) point to three potential setbacks. First, doctors often do not have enough time to stay up to date on research. Second, there are often interest groups (e.g. drug manufacturers) that pressure doctors to act in a certain way regardless of evidence. Third, doctors are often very reluctant to try things that are dramatically different from their standard practices. The same issues exist in policing. Police chiefs cannot be expected to sit and read every new peer reviewed article on policing interventions, which reinforces the importance of making research easily accessible and digestible. As noted earlier, police agencies face pressures from a number of constituencies, which can make evidence-based policing challenging. For example, a citywide hot spots policing strategy would involve allocating patrol based on where crime is concentrated, which would mean certain low-crime areas would get less patrol. Removing patrol resources can be politically dangerous for a chief and can lead to resident outcry. Police officers are also

reluctant to try things that are dramatically different from existing routines. Not all evidence-based practices need to be highly disruptive though. The hot spots experiment in chapter 4, for example, involves restructuring officer downtime, but officers are still focused on tactics like law enforcement and vehicle stops that fit in with existing routines.

None of this is to suggest that research evidence should ever be the only guiding force for policing policy and practice. There simply is not enough rigorous research evidence (nor could there ever be) to provide complete guidance to practitioners on what strategies to implement. As Lum and colleagues (2012) point out, the goal is to bring research into the conversation regarding how the police allocate their crime control resources, not to make research the only concern of police. While police should devote as many resources as possible to evidence-based strategies and should avoid strategies with evidence of significant backfire effects, police agencies cannot divorce themselves entirely from the political environments in which they exist. As a result, police practice will always be guided in part by pressures and demands from politicians, citizens, and other outside groups.

Guyatt and Busse (2006) point to two fundamental principles in evidence-based medicine that seem appropriate to consider here. First, evidence alone is never enough to completely guide decision making. In medicine, this means that a doctor cannot rely exclusively on research and ignore the characteristics and idiosyncrasies of a particular case or patient. The same is true in policing. Evidence-based policing will never be a total substitute for the importance of officer street-level discretion. The second principle

is that there is a hierarchy of evidence. Randomized experiments are at the top of the hierarchy because they have the highest level of internal validity and allow for causal statements about treatment (see Cook & Campbell, 1979, Weisburd, 2003). A doctor's clinical experience in a particular case is also on the hierarchy, although it appears at the bottom. This is an important reminder that while basing police practice completely on officer experience while ignoring research evidence threatens police effectiveness and efficiency, police experience also cannot be completely ignored in crafting policy and practice (see Moore, 2006). These principles are important to review here, as a reminder that while evidence-based policing is intended to make research play a more important role in police practice, there is no expectation that research will ever be the only factor guiding police efforts to reduce crime.

What Follows

The remaining chapters in this dissertation by articles are introduced below. The goal is to first more closely explore what the current evidence suggests about effective approaches for police and then provide an example of how police used this research in a successful intervention. Finally, the prospects and challenges for moving forward with making police officers more evidence-based will be discussed. In other words, what should police be doing, and can we get them to do it? Each of the four main body chapters were originally (or will be) standalone articles or book chapters and so there is at times some overlap across chapters, particularly in the literature reviewed and cited.

Nonetheless, each chapter presents new ideas that all fall under the general theme of moving forward with evidence-based policing.

Chapter 2 is a paper by Telep and Weisburd published in 2012 in *Police Quarterly* entitled "What is known about the effectiveness of police practices in reducing crime and disorder?" This paper draws upon an earlier paper by Telep and Weisburd (2011). This chapter is a narrative review of what we have learned about what police should and should not be doing to most effectively reduce crime and disorder. While previous narrative reviews of the literature have focused primarily on the question of "what works?" (e.g. see NRC, 2004; Sherman & Eck, 2002, Weisburd & Eck, 2004), this chapter is intended not only to update these reviews with the latest evaluation evidence, but also provide relevant information on what police agencies should be doing to implement effective strategies. In other words, instead of only focusing on what works, this chapter uses existing evidence to provide better guidance for police on how they can use evidence-based approaches. This chapter is focused specifically on what police officers should (and should not) be doing to best address high crime places and individuals. Overall, the chapter suggests that police should be focusing on hot spots policing, problem-oriented policing, focused deterrence approaches, directed patrol to reduce gun crime, and using DNA in property cases. Police should also recognize the importance of efforts to enhance legitimacy. In contrast, police should be avoiding standard policing tactics such as random preventive patrol, second responder programs, and Drug Abuse Resistance Education (D.A.R.E).

As an example of the structure of the chapter, there is a large body of research evidence that hot spots policing is an effective strategy for reducing crime and disorder. The NRC (2004) concluded that the strongest evidence of police effectiveness is for police focusing in on small high crime areas (see also Weisburd & Eck, 2004). This conclusion is supported by a recent update of a systematic review by Braga and colleagues (in press). The goal in this chapter though is to not only review the evidence suggesting hot spots policing works, but also provide, to the extent possible, guidance on what police can do to best address hot spots and implement hot spots policing. For example, simply increasing police officer presence shows evidence of effectiveness; just having officers present in the hot spots more often is a good thing (Sherman & Weisburd, 1995). To maximize effectiveness, however, it would be useful to more strategically allocate this increased patrol time by having officers randomly rotating between hot spots, spending about 15 minutes at a time in each one. This is the best way to maximize the deterrent abilities of the police (Koper, 1995). Another effective strategy is for the police to use problem solving approaches in crime hot spots in an effort to address some of the underlying conditions that are causing an area to be a hot spot (e.g. see Braga et al., 1999). Situational prevention strategies are also effective. This refers to police efforts to change the situational dynamics in hot spots, often through trying to change the number of opportunities that exist or increasing guardianship. For example, this might involve the police working with other agencies to increase street lighting or add cameras to a problem block. Finally, for hot spots policing to be effective, police need to dedicate

resources to crime mapping and analysis so they can accurately determine where hot spots are located (Lum, 2009).

The chapter also examines to what extent police are adopting evidence-based approaches, but notes that the data on this subject remain rather limited. The chapter concludes with a discussion on the need for future research on areas where the evidence remains mixed or too limited to draw strong conclusions for what the police should be doing. An issue raised here that will be revisited in the concluding chapter is the need for more data on how police officers are implementing particular innovations and what police are spending their time on day-to-day. Often because of budget limitations or because researchers were called in for a post-hoc evaluation, there is little or no data collection on what officers are doing when they carry out a particular intervention. This makes it challenging to know what sorts of activities work best in implementing police innovations.

Chapter 3 is a forthcoming paper by Telep and Weisburd reviewing what has been learned from systematic reviews in policing. The chapter will appear in a Springer volume edited by Farrington and Weisburd entitled, *Systematic reviews in criminology: What have we learned?* This chapter is a narrative review of what we learned from systematic reviews (primarily Campbell Collaboration systematic reviews; see Farrington & Petrosino, 2001) on policing topics. The chapter reviews all 16 of the completed or in-progress policing systematic reviews in an effort to categorize strategies based on what works, what does not, and what seems promising. As in chapter 2, the focus is primarily on police efforts to reduce crime and disorder, although other outcome measures are also

considered, in particular police efforts to increase citizen perceptions of legitimacy (while recognizing that the number of systematic reviews considering legitimacy-related outcomes is fairly small). An important consideration in moving police towards more evidence-based practices is ensuring that effective approaches are implemented in ways that maximize fairness. As Tyler (1990, 2004) argues, procedurally fair policing practices may help reinforce police effectiveness by increasing citizen perceptions of legitimacy, which in turn may increase overall compliance with the law.

As in chapter 2, this chapter provides lessons for police based on the collective wisdom gathered from this set of reviews. These lessons help reinforce the advice provided in chapter 2, this time drawing exclusively upon systematic reviews. Unlike traditional narrative reviews, systematic reviews often have the advantage of quantitatively combining the most rigorous evidence on particular topics in meta-analyses. While these effect size calculations are not perfect (see more below), they can provide a summary of the overall effectiveness of various strategies. Even without meta-analyses, systematic reviews offer a more comprehensive and transparent search and synthesis of the literature than most narrative reviews.

When these reviews find a sufficiently large pool of eligible studies, they often include moderator analyses that assess how particular program components or tactics affect the overall effectiveness of a particular strategy. This information is valuable for police agencies, because it provides some guidance on implementation rather than just an overall summary of whether or not something works. These moderators are discussed throughout the chapter and are reviewed in more detail in Table 2. Unfortunately, in

many reviews there were not enough eligible studies to do a moderator analysis or the list of moderators included is limited, but as the evidence base in policing continues to expand, future reviews will be able to expand the scope of moderators under consideration. As an example, Braga (2007) lamented in the original Campbell Collaboration hot spots review that even though the review suggested hot spots policing was effective, it contained limited policy guidance for police. In the updated review (Braga, Papachristos, & Hureau, in press), a moderator analysis suggested that saturation patrol was an effective approach for reducing crime, but problem solving strategies have a larger overall effect size and may be a more promising way to reduce crime in hot spots.

This chapter also addresses some of the challenges researchers and police face in drawing lessons from existing research. As noted above, this issue is also raised in chapter 2, but here the focus is more specifically of the problem of trying to combine studies to draw lessons for research and practice. A major first problem, for example, is that there are often an insufficient number of studies to combine. The lack of rigorous studies in some areas makes it challenging to reach strong conclusions in certain systematic reviews. Some of the additional technical problems in effect size calculation and meta-analysis are also raised in this chapter. Descriptive validity has been a particular problem (see Gill, 2011). Primary studies often do not devote sufficient attention to describing interventions in detail, making it difficult to understand why an intervention worked (or did not work), and there is often a lack of transparency in how

outcome measures are calculated, making it difficult or impossible at times for systematic reviewers to calculate effect sizes.

Of specific relevance here is whether these systematic reviews can be a useful tool for police in efforts to provide guidance on specific tactics. The Office of Community Policing Oriented Services (COPS Office) clearly views the reviews as a useful resource for police. They recently renewed their partnership with the Campbell Collaboration to produce practitioner-friendly guides that summarize and discuss reviews relevant to the police. Six such guides have already been published.[6] As previously mentioned, when the evidence base of rigorous studies is sizable, moderator analyses can provide very helpful quantitative evidence of the effectiveness of particular strategies or combinations of program elements. When the evidence base is smaller, police may gain knowledge about the overall effectiveness of a particular strategy, but may not learn as much about the best ways to implement this strategy (see Sparrow, 2011).

Chapter 4 is a paper by Telep, Mitchell, and Weisburd that is forthcoming in *Justice Quarterly*. The paper is entitled "How much time should the police spend at crime hot spots?: Answers from a police agency directed randomized field trial in Sacramento, California." This chapter is the evaluation of a recent hot spots intervention in the Sacramento Police Department (SPD). It is an explicit example of a police agency using the research evidence on what police should be doing to design an intervention that was successful in reducing crime. Thus, it follows well from the previous two chapters that discuss what police should be doing to most effectively address crime. The goal of

[6] These guides are available online at: http://www.cops.usdoj.gov/Default.asp?Item=2614

this chapter is to both highlight the results of the intervention and the success of a police agency taking the lead in implementing a rigorous study, and also describe how the Sacramento intervention could be a model for other agencies interested in having officers be more evidence-based in ways that are not highly disruptive to existing routines.

The intervention involved applying lessons from Koper's (1995) analysis of data from the Minneapolis hot spots experiment (Sherman & Weisburd, 1995) to allocate resources for hot spots policing. Koper (1995: 668) found that "police can maximize crime and disorder reduction at hot spots by making proactive, medium-length stops at these locations on a random, intermittent basis." Koper's (1995) analyses of Minneapolis data suggest that when officers spend about 15 minutes in a hot spot, they can maximize residual deterrence—that is, the time after officers leave the hot spot before disorderly activity restarts. The Sacramento experiment involved officers visiting treatment group hot spots in a random order for about 15 minutes each, while the control group hot spots received standard policing. This was one of the first studies to use Koper's (1995) recommendations in an experimental context. Results suggested significant overall declines in both total calls for service and serious crime incidents in the treatment group hot spots relative to the control group hot spots.

These results are important not only because they add to the evidence base on effective strategies to address crime hot spots, but also because they have important implications for the focus of this dissertation. This intervention was specifically about how police officers allocate their resources at crime hot spots. Unfortunately, because of a lack of outside funding for the intervention, the study suffers from a flaw of many hot

spot interventions. No data were collected on what officers actually did while they were present in the treatment group hot spots. While officers were given tips and suggestions on proactive activities they could engage in and were encouraged to make contacts with citizens and motorists, there is no way of assessing what particular activities were most effective. This is a study of how officers used their time to address hot spots, not of what specifically they were doing in these hot spots.

Nonetheless, the study has important implications for police because it provides specific guidance on one successful method for implementing hot spots policing. "Hot spots policing works" is not as helpful to a police administrator as "Visiting hot spots in a random order for about 15 minutes each works."[7] The Sacramento experiment has clear policy implications for agencies interested in adopting hot spots policing. This is not to suggest that the Sacramento model is the only way or even the best way to address hot spots, but it is one strategy that showed overall effectiveness and does not require extensive training or special skills for officers to implement. The study received no outside funding and was conducted using existing Sacramento Police Department patrol and crime analysis resources. No overtime money was used either. In an era of limited budgets for law enforcement, the study provides an example of an effective, fairly inexpensive way for the police to target high crime areas.

It is also important to note that the study was largely implemented and overseen within the Sacramento Police Department. The department consulted extensively with

[7] Police could even further maximize their efficiency by using 15 minute hot spot visits in concert with efforts to minimize the distance officers must travel between hot spots. Hot spots policing will likely be less effective and efficient if officers must travel large distances between hot spots and thus spend much of their time in transit rather than focused on high crime micro places.

Cynthia Lum, Christopher Koper, and David Weisburd to design the experiment, but the experiment was largely supervised by the crime analysis unit (see Mitchell, 2012) and as noted above, there was no grant money used for the intervention. This represents an example of a police department taking ownership of science, as Weisburd and Neyroud (2011) have advocated. They note that evidence-based policing cannot become a reality without police agencies playing a greater role in the production of high quality research and becoming more invested in using science to guide practice. The Sacramento experiment represents an example of a police agency using the best available science to guide the development of an intervention and then rigorously evaluating that new strategy to demonstrate its effectiveness in reducing crime. This approach follows the model of bringing research into practice that is the major theme of this dissertation. This is to not to suggest, however, that the Sacramento story is a totally successful one. While the department continues to show some interest in hot spots policing, there has not been continued support for expanding the program or for conducting further rigorous evaluation of SPD interventions. Chapter 5, discussed below, provides some potential reasons for what might be described as a lack of follow through by department management.

Chapter 5 is a paper developed as part of the dissertation that will be submitted for publication. This chapter focuses on prospects and impediments for getting police officers to be more evidence-based, drawing upon the results of survey research in the Sacramento Police Department and the Richmond, Virginia Police Department. This chapter begins with a discussion of the importance of addressing receptivity to research

in policing, drawing upon the work of Lum and colleagues (2012). They find that studies of police officer receptivity to research are rare, but understanding how and why officers use research in their daily work is a crucial step in bridging the current gap between research and practice.

This chapter introduces the Lum and Telep receptivity survey (see a copy of the survey in Appendix A) as a tool for better assessing officer and agency receptivity to research. The officer survey is designed to provide one indicator of the extent to which evidence-based policing is happening in practice. While evidence-based policy has become a major buzzword in academic and policy circles, it is not clear that officers at the street level (or even supervisors) have a clear understanding of what evidence-based policing entails or how to be more evidence-based. Thus, the survey was created as an assessment tool to allow for comparisons both within and across departments. To date, the survey has been piloted in a police department in California and implemented more widely in the Sacramento and Richmond Police Departments. As part of the George Mason University Matrix Demonstration Project,[8] in which agencies are using research knowledge from the Evidence-Based Policing Matrix to guide new policies, practices, and interventions in the department, some demonstration sites plan to use the survey to examine changes in officer views and attitudes before and after the implementation of demonstration projects.

[8] The Matrix Demonstration Project is focused on the institutionalization of evidence-based policing into practice. The project is led by principal investigators Cynthia Lum and Christopher Koper and is funded by the Bureau of Justice Assistance. See more about the Matrix Demonstration Project at http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/

The findings from the receptivity survey in Sacramento and Richmond overall suggest both prospects and challenges for moving forward with evidence-based policing. Officers have limited knowledge of the term "evidence-based policing" and the majority make little use of research tools and resources to learn information about the effectiveness of policing strategies. The findings on officers' understanding of research evidence are mixed with officer views in line with the research evidence for some innovations like problem-oriented policing and less in line with what the research suggests for more traditional practices such as random preventive patrol and rapid response to 911 calls. These somewhat mixed findings appear throughout the survey. Officers generally value experience more than research evidence to guide day-to-day practice, but also tend to recognize the value of working with researchers to address crime and disorder. Additionally, officers show some willingness to conduct evaluation research, but are most interested in using less rigorous methodologies. Officers also tended to be more willing to consult individuals within the department for assistance on evaluating tactics versus working with outside academics. Although the findings across agencies are fairly similar, there are some differences. For example, officers in Richmond tend to use materials from crime analysis more frequently and officers in Sacramento tend to view information from research on policing as more useful. Chapter 5 also finds fairly limited variation in officer responses based on personal and departmental characteristics.

Chapter 5 is one of the first examinations of officer receptivity to research and evidence-based approaches in policing. The results, while largely descriptive, help shed

new light on issues of receptivity and overall suggest that while officers are generally open to new ideas, the importance of academics, and doing some types of evaluation, there still is much progress that can be made in terms of exposing officers to the research evidence on policing and the benefits of rigorous evaluation. This chapter is a first step in further exploring issues of receptivity and future research on these and additional data from other agencies will help better inform our understanding of how officers view and respond to research and evidence-based policing.

Finally, chapter 6 provides concluding remarks. This chapter summarizes the lessons learned from the previous chapters and focuses on important areas for future research. In particular, this chapter stresses the need for additional data collection on what police are actually doing when they implement innovative strategies. That is, additional research on the link between specific officer activities and crime reduction is needed to help inform recommendations on the particular activities officers should be engaged in. More research is also needed on issues of police fairness and legitimacy and how the police can simultaneously be fairer and more evidence-based to truly address crime effectively. The NRC (2004: 2) argued that "evidence from policing research contradicts any concern that an emphasis on policing that is fair and restrained will necessary undermine their crime control effectiveness, and vice versa, for fairness and effectiveness are not mutually exclusive, but mutually reinforcing." This is a powerful statement, suggesting that there is no reason why evidence-based policing cannot also enhance police legitimacy, but it is an issue that to date has not been well-researched.

Another major focus of chapter 6 is how police can best apply and adopt the research presented in chapters 2 and 3, taking into account lessons learned in chapters 4 and 5. Lessons from the research utilization literature in a number of fields are presented in an effort to inspire more thinking about what both researchers and police agencies need to be doing to make evidence-based policing more of a reality. Key issues include building strong police-researcher partnerships, ensuring researchers and practitioners are communicating effectively, and recognizing the importance of agency context in efforts to increase research utilization.

Overall, this dissertation by articles is focused on the important topic of moving forward with evidence-based policing. Moving forward requires a number of steps addressed in the chapters that follow. These include using the available rigorous research evidence to provide guidance to police on what they should and should not be doing, an issue addressed in chapters 2 and 3. Police also need to be able to successfully implement and evaluate evidence-based practices. Such implementation will be easier when interventions do not require dramatic shifts in existing officer routines and behavior. An example of the successful implementation of an evidence-based hot spots approach is the focus in chapter 4. Finally, evidence-based policing cannot move forward without support on the ground from line officers and their supervisors. Chapter 5 focuses on police officer receptivity to research and more closely examines the prospects and pitfalls for making policing more evidence-based, while chapter 6 focuses in part on the best approaches for increasing research utilization in policing.

CHAPTER TWO: WHAT IS KNOWN ABOUT THE EFFECTIVENESS OF POLICE PRACTICES IN REDUCING CRIME AND DISORDER?[9]

Introduction

Over the past two decades a number of reviews of the policing evaluation literature have focused on the question of what police can do to most effectively address crime and disorder. Our goal is not to simply replicate what has already been accomplished in these prior papers, although we devote space to reviewing the collective wisdom from these earlier reviews. Instead, we hope to build upon and synthesize these reviews to categorize strategies and tactics based on what police should and should not be doing. Although the evaluation literature is often more focused on the question of "does it work?" we provide, as much as possible, relevant information on what police agencies should be doing to implement effective strategies. Based on the limited available data, we will also discuss how current policing policies and practices match up with effective practices. That is, are police doing what they should be doing?

We first briefly review the sources of research evidence we consulted for this review. We then turn to our review of what police should be doing and what police

[9] This chapter originally appeared in *Police Quarterly*, published by SAGE Journals. Original citation: Telep, C. W., & Weisburd, D. (2012). What is known about the effectiveness of police practices in reducing crime and disorder? *Police Quarterly*, *15*(4), 331–357. An earlier version of this paper was presented at "Understanding the crime decline in NYC" funded by the Open Society and is available at: http://www.jjay.cuny.edu/Telep_Weisburd.pdf.

should not be doing. We cover a broad span of police strategies, focusing in particular on a number of innovations in policing that have developed over the past 20 to 30 years (see Weisburd & Braga, 2006a). After reviewing the research evidence, we discuss the implications for policing and conclude by noting areas where we currently know too little to make informed recommendations.

Sources for the Review

We consulted a number of sources and previous reviews of the policing literature to develop our assessments of what the police should and should not be doing. These included the Maryland report chapter on policing (Sherman, 1997; Sherman & Eck, 2002), the National Research Council (NRC, 2004; see also Weisburd & Eck, 2004) report on police policy and practices, the Evidence-Based Policing Matrix (Lum, Koper, & Telep, 2011) and the Office of Justice Programs' Crimesolutions.gov website. Additionally we reviewed all Campbell Collaboration systematic reviews concerning policing and law enforcement. The Campbell Collaboration Crime and Justice Coordinating Group (see Farrington & Petrosino, 2001) has published over 25 systematic reviews on criminal justice topics, many of which are relevant to the question of what works in policing. We also examined additional prior reviews of the policing effectiveness literature including Sherman (1992a), Eck and Maguire (2000), Farrington and Welsh (2005), Weisburd and Braga (2006a), and Braga and Weisburd (2007).

We were limited in the resources available to assess what police are currently doing. We relied primarily on the 2007 Law Enforcement Management and Administrative Statistics (LEMAS) data (Reaves, 2010), while also making use of survey data from the Police Executive Research Forum (PERF) on policing strategies related to hot spots (PERF, 2008). We used these multiple reviews and data sources to categorize policing strategies into those that we believe police should be engaging in and those they should not be using. We discuss these areas in detail below.

What Should Police Be Doing?

What strategies are most successful, and how should police implement them? We point to a number of successful strategies below that show strong evidence of effectiveness in addressing crime. We discuss both what works and how police can best adopt what works.

Hot Spots Policing

The evidence base for hot spots policing is particularly strong, making it a logical place to start our discussion. As the NRC (2004: 250) review of police effectiveness noted "studies that focused police resources on crime hot spots provided the strongest collective evidence of police effectiveness that is now available." The Braga (2007) Campbell systematic review reached a similar conclusion; the vast majority of hot spots

studies show significant positive results, suggesting that when police focus in on high crime small geographic areas, they can significantly reduce crime in these locations (see also Braga, Papachristos, & Hureau, in press). Fifty percent of calls or incidents are typically concentrated in less than five percent of places (e.g. addresses or street segments) in a city (Sherman, Gartin, & Buerger, 1989; Weisburd et al., 2004), and there is often street-by-street heterogeneity in crime (Groff, Weisburd, & Yang, 2010). That is, the action of crime is often at the street and not the neighborhood level. Thus, police can target a sizable proportion of citywide crime by focusing in on a small number of high crime places (see Weisburd & Telep, 2010).

In Braga and colleagues' (in press, see also Braga, 2005, 2007) meta-analysis of experimental studies, they found an overall mean effect size of 0.184, suggesting a meaningful benefit of the hot spots approach in treatment compared to control areas. As Braga (2007: 18) concluded, "extant evaluation research seems to provide fairly robust evidence that hot spots policing is an effective crime prevention strategy." Importantly, there was little evidence to suggest that spatial displacement was a major concern in hot spots interventions. Crime did not simply shift from hot spots to nearby areas (see also Weisburd et al., 2006).

What Should Police Be Doing at Crime Hot Spots?

While the evidence on the effectiveness of hot spots policing is persuasive, there still remains the question of what specifically police officers should be doing at hot spots to most effectively reduce crime. The literature thus far has not provided the same level

of guidance. As Braga (2007: 19) notes "Unfortunately, the results of this review provide criminal justice policy makers and practitioners with little insight on what types of policing strategies are most preferable in controlling crime hot spots." The update to Braga's (2007) review by Braga and colleagues (in press) does provide some additional guidance, suggesting that problem-oriented hot spots interventions may be somewhat more effective than simply increasing police presence, although the authors caution these comparisons are based on a small number of studies. The existing literature also sheds some light on what police should be doing to most effectively address crime hot spots.

The first hot spots study, the Minneapolis Hot Spots Patrol Experiment, suggested that increased police presence alone leads to some crime and disorder reduction (Sherman & Weisburd, 1995). Officers were not given specific instructions on what activities to engage in while in hot spots. They simply were told to increase patrol time in the treatment hot spots. While the study did not include a systematic examination of officer activities, subsequent analyses by Koper (1995) provide some insight into how much time officers should be spending in hot spots. He found that each additional minute of time officers spent in a hot spot increased survival time by 23 percent. Survival time here refers to the amount of time after officers departed a hot spot before disorderly activity occurred. The ideal deal time spent in the hot spot was 14 to 15 minutes; after about 15 minutes, there were diminishing returns, and increased time did not lead to greater improvements in residual deterrence. This phenomenon is often referred to as the "Koper curve" as graphing the duration response curve shows the benefits of increased officer time spent in the hot spot until a plateau point is reached (see Koper, 1995, Figure 1).

As Koper (1995: 668) notes "police can maximize crime and disorder reduction at hot spots by making proactive, medium-length stops at these locations on a random, intermittent basis in a manner similar to Sherman's (1990) crackdown-backoff rotation strategy." Both Koper (1995) and Sherman (1990) argue for an approach in which police travel between hot spots, spending about 15 minutes in each hot spot to maximize residual deterrence, and moving from hot spot to hot spot in an unpredictable order, so that potential offenders recognize a greater cost of offending in these areas because police enforcement could increase at any moment.

Recently Koper's (1995) recommendation has been applied to the design of multiple hot spots policing experiments. Lum (2010) first suggested the use of the Koper curve as a translation tool for police agencies. She argued that because officers tend to already be concerned with time, the Koper curve provides a straightforward way to explain to departments how to respond to crime concentrations. These principles were applied to an experimental evaluation of license plate reader technology by Lum and colleagues (2011), although this study used a less intensive treatment than Minneapolis and did not find any significant crime control benefits. The Sacramento Police Department recently undertook a three month randomized experiment in which officers were explicitly instructed to randomly rotate between treatment group hot spots and to spend about 15 minutes in each hot spot. Results suggest the Koper (1995) approach to hot spots policing had a significant impact on crime. Treatment group hot spots had significantly fewer calls for service and Part I crime incidents than control group hot spots when comparing the three months of the experiment in 2011 to the same period in

2010 (Telep, Mitchell, & Weisburd, in press). Ariel and Sherman (2012) applied the Koper Curve to crime in the London Underground in an experimental study with the British Transit Police. They found a significant decline in calls for service in the high crime treatment subway stations compared to the control stations that did not receive extra 15 minute patrols.

The Braga and Bond (2008) hot spots experiment in Lowell, Massachusetts included a mediation analysis to assess which hot spots strategies were most effective in reducing crime. Results suggested that situational prevention strategies (see Clarke, 1995) had the strongest impact on crime and disorder. Such strategies focus on efforts to disrupt situational dynamics that allow crime to occur by, for example, increasing risks or effort for offenders or reducing the attractiveness of potential targets. Such approaches are often a prominent part of hot spots interventions and include things like razing abandoned buildings and cleaning up graffiti. Increases in misdemeanor arrests made some contribution to the crime control gains in the treatment hot spots, but were not as influential as the situational efforts. Social service interventions did not have a significant impact. These findings suggest not only the importance of situational crime prevention as a strategy for addressing crime facilitators in hot spots, but also that aggressive order maintenance through increases in arrests may not be the most effective way of addressing high disorder places. We discuss later the potential negative consequences of intensive enforcement (see Braga & Weisburd, 2010). Even if arrest is one means of reducing crime in hot spots, these findings imply it is not the only (or most

effective) way, suggesting the need to develop more multi-faceted approaches to dealing with high crime areas.

An additional promising approach for dealing with crime hot spots is having officers incorporate principles from problem-oriented policing (POP). We discuss problem-oriented policing more below, but note here the results of a recent experiment in Jacksonville, Florida (Taylor, Koper, & Woods, 2011). This study was the first to compare different hot spot treatments in the same study with one treatment group receiving a more standard saturation patrol response and the second receiving a problem-oriented response that focused on officers analyzing problems in the hot spot and responding with a more tailored solution. Results showed a decrease in crime (though not a statistically significant decrease) in the saturation patrol hot spots, but this decrease lasted only during the 90-day intervention period. In the POP hot spots, there was no significant crime decline during the intervention period, but in the 90 days after the experiment, street violence declined by a statistically significant 33 percent. These results offer the first experimental evidence suggesting that problem-oriented approaches to dealing with crime hot spots may be more effective than simply increasing patrols in high crime areas. They also suggest that problem solving approaches may take more time to show beneficial results, but any successes that come from a problem-oriented framework may be more long-lasting in nature.

Braga and Weisburd (2010) detail the desirability of problem-oriented policing as a strategy for long-term crime reduction in chronic hot spots. They recognize that even when agencies use problem solving approaches, they often tend to prioritize more

traditional, enforcement-oriented responses (see more below). Drawing upon the results of Braga and Bond (2008) and other hot spots studies, they argue that "situational" problem-oriented policing is not only more innovative but also more likely to produce significant crime control benefits. As they conclude "based on the available empirical evidence, we believe that police departments should strive to develop situational prevention strategies to deal with crime hot spots. Careful analyses of crime problems at crime hot spots seem likely to yield prevention strategies that will be well positioned to change the situations and dynamics that cause crime to cluster at specific locations" (Braga & Weisburd, 2010: 182–183). We revisit this issue below.

Finally, we briefly discuss the prospects of applying principles from the correctional treatment literature to dealing with crime hot spots. The risk-needs-responsivity model argues that treatment resources should be focused on high risk clients, address criminogenic risk factors, and be responsive to the client's specific needs while generally focusing on cognitive-behavioral principles (see Andrews & Bonta, 2010). These principles can help inform police crime control strategies. First, the risk principle applies quite clearly to policing tactics. Police should be directing their resources at the highest risk clients, in other words chronic crime hot spots.

The need principle is a bit trickier; what are the criminogenic needs of places that need to be addressed? Recent research by Weisburd, Groff, and Yang (2012) in Seattle provides new insights into the key risk factors that help explain whether places become hot spots or not. Weisburd et al. (2012) combined 16 years of data on crime incidents geocoded to street segments with an array of data on characteristics of these streets.

Overall, they find that social and opportunity factors are very highly concentrated at the street block level, and these concentrations are generally very closely linked to concentrations of crime. This suggests that certain factors may contribute to street segments remaining hot spots of crime over time, and hence could be viewed as criminogenic risk factors for a street becoming a crime hot spot.

Some of these factors are easier for the police to address than others. For example, the number of employees working on a block is a strong predictor of a street segment being a chronic hot spot. While the police have little control over the number of people working on a block, they can control the level of guardianship they provide on each block and how they approach the potential crime attractors and generators on each block (e.g. working to install CCTV in parking areas on streets with many employees to reduce car break-ins). Police may be able to have a more direct impact on the activities of high risk juveniles (defined as those with high rates of truancy and poor school performance). Higher numbers of high risk juveniles on a block substantially increased the likelihood a street would be a chronic hot spot. Increased enforcement from police could reduce levels of truancy and limit the amount of time these juveniles spend on their street unsupervised.

Finally, the responsivity principle in the context of crime hot spots suggests the need to systematically assess the conditions of hot spots to better tailor intervention approaches. This is exactly in line with the problem-oriented approach discussed above and described in more detail below. Further study of interventions in crime hot spots could eventually lead to the creation of risk assessment tools, already used quite

commonly in correctional interventions, designed specifically for places (see Sherman, 1998). These risk and need assessments could not only help guide police interventions, but also help suggest relevant agencies and groups for the police to partner with to appropriately address a hot spot's criminogenic needs.

Problem-Oriented Policing

Problem-oriented policing was described above as a frequent strategy in hot spots interventions, but the problem-oriented framework can be applied to an array of different geographic units and types of problems. Goldstein (1979) originally advocated for a paradigm shift in policing that would replace the primarily reactive, incident driven "standard model of policing" (see below; Weisburd & Eck, 2004) with a model that required the police to be proactive in identifying underlying problems that could be targeted to alleviate crime at its roots. Goldstein's approach was elaborated by Eck and Spelman's (1987) SARA model. SARA is an acronym representing four steps they suggest police should follow when implementing POP. "Scanning" involves the police identifying and prioritizing potential problems. The next step is "Analysis," which involves the police thoroughly analyzing the problem(s) using a variety of data sources so that tailored responses can be developed. The "Response" step has the police developing and implementing interventions designed to solve the problem(s). The final step is "Assessment," which involves assessing whether the response worked.

Weisburd, Telep, Hinkle, and Eck (2010) conducted a Campbell review on the effects of POP (i.e. studies that followed the SARA model) on crime and disorder, finding a modest but statistically significant impact among 10 experimental and quasi-experimental studies. Some of the studies in this review that showed smaller effects (or backfire effects) experienced implementation issues that threatened treatment fidelity. The more successfully implemented studies tended to show stronger effects. Additionally, Weisburd et al. (2010) also collected less rigorous but more numerous pre/post studies without a comparison group. While the internal validity of these studies is weaker than those in the main analysis, these studies are notable in the remarkable consistency of positive findings. Weisburd et al. (2010: 164) conclude that "POP as an approach has significant promise to ameliorate crime and disorder problems broadly defined."

How Should Police Be Implementing Problem-Oriented Policing?

As the Weisburd et al. (2010) review notes, problem-oriented policing covers a broad array of responses to a wide range of problems and our evidence base of rigorous studies remains quite limited. This makes it difficult to give specific recommendations as to how police agencies should deal with certain types of problems. Goldstein's (1979) notion of problem-oriented policing, however, was not designed to provide agencies with specific ways of handling problems. Indeed, Goldstein (1979, 1990) rejected such one-size fits all tactics that had been typical in the "standard model of policing." Essential to problem-oriented policing is the careful analysis of problems to design tailor-made

solutions. While individualized solutions are important, it is also the case that police agencies across the U.S. often face very similar types of problems that may respond to similar types of solutions. The Center for Problem-Oriented Policing has recognized this, creating over 60 problem-specific guides for police that provide recommendations on how agencies can tackle a number of different problems. These guides would likely benefit from additional rigorous evaluations of problem-oriented policing interventions covering a range of problems.

In their Campbell review, Weisburd, Telep, Hinkle, and Eck (2008) do provide some limited guidance on the types of problem-oriented policing interventions that seem to be most effective. As noted earlier, hot spots policing interventions that use POP have shown particularly successful results. In such studies, it is difficult to disentangle whether problem solving or the focus on small geographic areas is driving the success, but the two strategies seem to work quite well in concert. Second, problem-oriented policing appears most effective when police departments are on board and fully committed to the tenets of problem-oriented policing. In Stone's (1993) problem-oriented policing project in Atlanta public housing, for example, the program suffered greatly because the police were not fully committed to problem-oriented policing. Third, program expectations must be realistic. Officer caseload must be kept to a manageable level and police should not be expected to tackle major problems in a short period of time. In the Minneapolis Repeat Call Address Policing study (Sherman, Buerger, & Gartin, 1989), for example, officers were overwhelmed by dealing with more than 200 problem addresses in a 12-month period (but see Sherman, 2007). Conversely, Braga and

colleagues (1999) gave officers a more manageable 12 hot spot caseload in the Jersey City experiment, and officers were more effective in implementing the response. Fourth, based on limited evidence, collaboration with outside criminal justice agencies appears to be an effective approach in problem-oriented policing. The two probationer-police partnerships included in the review were particularly successful in reducing recidivism (see Weisburd et al., 2008).

In terms of using the SARA model to guide POP, Braga and Weisburd (2006) note that police agencies typically fail to conduct the in-depth problem-analysis advocated by Goldstein (1990). Indeed they often engage in a form of "shallow problem solving" that involves only peripheral analysis of crime data and a largely law enforcement-oriented response (see also Cordner & Biebel, 2005). While we do not want to advocate shallow adherence to the SARA model, the evidence cited here suggests that even shallow problem analysis is effective in reducing crime and disorder. This also suggests that if police were to more closely follow the SARA model and expand their repertoire of responses beyond traditional law enforcement they might enjoy even greater crime control benefits from problem-oriented policing. The assessment phase in SARA also tends to be a weak area for many police agencies, but one that is incredibly important to inform police practice. As Sherman (1998) notes, evidence-based policing involves not only police using strategies and tactics shown to be effective, but also agencies constantly evaluating their practices. The assessment phase of the SARA model provides a framework for agencies to consistently learn from and improve their problem solving projects.

Pulling Levers (Focused Deterrence Strategies)

A recent systematic review of focused deterrence strategies by Braga and Weisburd (2012a) suggests such strategies have significant beneficial impacts on crime, particularly violent crime. The overall idea of such approaches is that police can increase the certainty, swiftness, and severity of punishment in a number of innovative ways, often by directly interacting with offenders and communicating clear incentives for compliance and consequences for criminal activity (Kennedy, 2009). Many of these strategies employ the "pulling levers" framework popularized in Boston with Operation Ceasefire (Braga et al., 2001), in which gangs were notified that violence would no longer be tolerated and if violence did occur, every available legal lever would be pulled to bring an immediate and certain response.

While Operation Ceasefire was associated with significant declines in young adult homicide in Boston, the lack of a randomized controlled design raises significant questions regarding the validity of the findings. Braga et al. (2001) did find the crime decline in Boston was unique when compared to other major U.S. cities and other cities in Massachusetts. The Braga and Weisburd (2012a) review included 11 eligible studies in the main analysis (10 focused on policing), but none were randomized experiments specifically focused on policing. Randomized designs are more difficult here than in other police interventions because focused deterrence strategies often are implemented citywide. The Braga and Weisburd (2012a) results overall suggest strong positive

findings for focused deterrence approaches. Ten of the 11 eligible studies showed significant positive impacts on crime.

What Should Police Be Doing in Focused Deterrence Approaches?

As Braga and Weisburd (2012a) note, focused deterrence strategies are a subgroup of problem-oriented policing interventions and as a result, exact strategies should vary by city and be tailored to the specific gang and gun crime problems a jurisdiction faces. In other words, it is important for agencies to not simply replicate what was done in Operation Ceasefire (Braga, 2008). The framework used in Boston is useful, but the same tactics and strategies may not be appropriate across jurisdictions. It is more important that the police focus on developing a working group of representatives from various governmental and social service agencies and conduct a careful analysis to assess underlying issues and tailor strategies to the dynamics of the local gang violence problem. As Braga and Weisburd (2012a: 349) conclude, "police departments…can be effective in controlling specific crime problems when they engage a variety of partners, and tailor an array of tactics to address underlying criminogenic conditions and dynamics." That is, the interagency working group carefully analyzing local conditions to develop an appropriate tailored strategy appears to be the key to effectiveness in pulling levers and other focused deterrence approaches.

The work of Braga and colleagues (2008) in Lowell is a good example of the need to use analysis and tailor responses to local dynamics. The Project Safe Neighborhoods task force carefully analyzed homicides and assaults to develop a two-pronged approach

to deal with different types of gangs. For Hispanic gangs, a more traditional pulling levers approach was used that focused on sending a strong message to chronic offenders that violence would not be tolerated. Lowell also had a sizable Asian gang problem. Asian gangs typically are more organized, more secretive and have a lesser street presence, making it more difficult to communicate deterrent messages. The task force was able to take advantage of the fact that in Lowell, Asian youth gangs were closely tied to gambling operations overseen by older Asians. The importance of these gaming operations to older Asians was an important lever the task force could pull. The task force used older Asian males as guardians to oversee gang members. Gaming operators received the strong message that if there was more youth violence, the gambling operations would be shut down. This proved to be a strong deterrent, and this tailored approach was developed only through the careful analysis of local conditions by the task force.

Additionally, it is important to emphasize the word focused in focused deterrence strategies. These strategies were successful in part because they created a credible deterrent threat (Kennedy, 2009). This was accomplished, to some extent, by narrowing the focus of the intervention to specific offenders and specific geographic areas. Thus, even though Operation Ceasefire was evaluated as a citywide intervention in Boston, "the deterrence message was applied to a relatively small audience (all gang-involved youth in Boston) rather than a general audience (all youth in Boston), and operated by making explicit cause-and-effect connections between the behavior of the target population and the behavior of the authorities" (Braga et al., 2001: 201–202). The program was credible

because it was realistic to believe the police and their partners could effectively target gang members living and offending in small geographic areas. Therefore, despite evaluations that use the entire city as the unit of analysis, in reality the programs are more focused on specific offenders and specific geographic areas within these larger contexts and hence share much in common with the other effective geographically focused police strategies reviewed above.

Directed Patrol to Prevent Gun Violence

Similar to focused deterrence strategies, the evidence base for directed patrol as a strategy to reduce gun violence is promising, although not as methodologically rigorous as hot spots policing and problem-oriented policing. There are no randomized experiments on directed patrol, but multiple quasi-experimental studies suggest that intensive patrol in high gun crime areas can lead to reductions in gun carrying and gun-related violence. These strategies are in some sense a hot spots approach, but the areas targeted in the interventions are typically much larger than hot spots (e.g. police beats or neighborhoods). A systematic review by Koper and Mayo-Wilson (2006) concluded that directed patrol strategies are effective, but cautioned that the results are based on only seven comparisons from four quasi-experimental studies. While six of these seven comparisons showed positive results, there was also wide variation in the overall effects. For example, the declines in gun-related crime ranged from 29 percent to 71 percent across studies and different outcome measures.

What Should Police Be Doing in Directed Patrol Interventions?

The small number of rigorous studies limits our ability to make strong recommendations on the particular techniques police should use in directed patrol interventions beyond the general recommendation that more intensive police presence in high gun crime beats seems to be effective. The Indianapolis directed patrol study provides some suggestive evidence, because it included two intervention beats, which used somewhat different approaches and had differing results (McGarrell et al., 2001). Significant crime control benefits were found only in the beat using more arrests and no significant crime reduction occurred in the beat focusing more on increasing the number of vehicle stops. McGarrell et al. (2001) argue it is unlikely that variation in the rate of gun seizures can explain the difference, because the more successful beat actually had fewer gun seizures. Instead, they argue that the targeted offender approach in the arrest-oriented beat was more effective because it sent a deterrent message that police were increasing surveillance in the area. Additionally, arresting these individuals may have been an important way to remove individuals responsible for a lot of gun crime from the streets. In contrast, the less successful target site used a more general "wider net approach" that may have diluted enforcement resources, reducing effectiveness and efficiency (McGarrell et al., 2001: 143). Thus the overall approach here is similar to the findings of the focused deterrence strategies reviewed above. When deterrence efforts are focused on the highest risk offenders and the deterrent threat is credible significant crime control benefits are more likely.

Using DNA Evidence in Property Crime Cases

Finally, we briefly note promising findings from a multi-site experimental study by Roman, Reid, Chalfin, and Knight (2009), which suggests that using DNA evidence in property crime cases leads to a greater number of identified suspects than traditional investigation methods and is a cost-effective approach (see also Wilson, McClure, & Wilson, 2010). Across all five sites, rapid DNA testing led to higher rates of suspect identification and suspect arrest. Identifying suspects alone does not indicate that crime rates will be affected, so more research is needed on the long-term impact of the increased use of DNA, but this research is promising for police efforts to address crimes they are aware of. Additionally, since offenders identified by DNA had more than twice as many prior felony arrests as those identified by standard investigatory work, it is not unreasonable to argue that the increased use of DNA will help identify more high-rate offenders, which could have some beneficial impact on overall crime rates. In an era of low clearance rates for property crime (based on Uniform Crime Report data, 12.4 percent of burglaries were cleared by arrest in 2010) any changes that can improve the effectiveness of investigatory work should be welcomed by police.

What Should Police Agencies Do With This Research?

The overall conclusion of the Roman et al. (2009) study that agencies should increase the use of DNA testing in property crime cases is fairly clear. We should note though that all the sites had some issues with implementation, particularly because of limited resources for DNA analysis. While recognizing that agency budgets are currently

stretched thin, efforts should be made to increase crime lab capabilities to reduce the outsourcing of DNA tests and backlogs in the analysis of evidence. Additionally, evidence technicians tended to be no better than patrol officers at obtaining usable samples for analysis, so patrol officers, who tend to be less expensive, can be dispatched to the scene of property crimes and still effectively collect DNA samples.

Potential Negative Consequences of Effective Programs: The Importance of Police Legitimacy

Some scholars have recently argued that intensive police interventions such as hot spots policing may erode citizen perceptions of the police (see Rosenbaum, 2006; Kochel, 2011). While our focus here is on the crime control effectiveness of police interventions, police legitimacy remains highly relevant, because a growing body of research suggests that when citizens see the police as more legitimate, they are more likely to comply with police directives and the law (Tyler, 1990, 2004; Tyler & Huo, 2002). Tyler's (1990) research focuses on procedural justice in police-citizen encounters as the key antecedent of legitimacy. Procedural justice, according to Tyler (2004) includes four components. First, citizens need to participate in the decision process (i.e. be given a voice). Second, neutrality is a key element of procedural justice. Citizens tend to view a situation as fairer when officers are transparent about why they are resolving a dispute in a particular way. Third, individuals want to be treated with dignity and respect. Finally, citizens are more likely to view an interaction as fair when they

trust the motives of the police. Citizens will view the action taken as fairer if the officer shows a genuine concern for the interests of the parties involved.

Survey research by Tyler (1990, 2004) and field research by Mastrofski, Snipes, and Supina (1996) and Paternoster, Brame, Bachman, and Sherman (1997) suggests that when officers incorporate these components of procedural justice into their interactions with citizens and suspects, citizens are more likely to comply with police directives and the law because they see the police as more legitimate. These increases in legitimacy thus have the potential to reduce crime by increasing compliance behavior. The concern with hot spots policing and other intensive interventions is that citizens may view the increased police presence and aggressive tactics as procedurally unfair (see Kochel, 2011; Rosenbaum, 2006). Thus, hot spots interventions may lead to short term crime control gains that could be erased in the long term if compliance behavior is reduced as a result of lower citizen perceptions of police legitimacy. Police therefore should prioritize involving the community and consulting with the community as much as possible in intensive efforts and also should strive to treat citizens in a procedurally fair manner. It is situations such as arresting an offender or citing a motorist where procedural justice can play a particularly important role in preserving (or enhancing) the legitimacy of the police, despite the undesirable outcome the citizen is receiving from an officer.

Despite these arguments that intensive interventions such as hot spots policing will have negative impacts on police legitimacy, the limited evidence available from such interventions tends to suggest that citizens living in targeted areas welcome the increased police presence (Shaw, 1995; but see Hinkle & Weisburd, 2008). Recent research from

three cities in San Bernardino County, California found that a broken windows style intervention in street segments had no impact on resident perceptions of police legitimacy (Weisburd et al., 2011). Nonetheless, we have little data on the legitimacy perceptions of individuals who are stopped or arrested in the context of hot spots policing programs. Gau and Brunson (2010) find in interviews that aggressive order maintenance activities can have damaging impacts on youth perceptions of procedural justice and police legitimacy, suggesting that there may be more serious legitimacy consequences for young people or others who are likely to come into contact with police officers in intensive police interventions.

Community Policing as a Means to Increase Police Legitimacy

Because of the important role police legitimacy appears to play in ensuring police effectiveness, police should also focus on increasing the fairness of their crime control efforts. We describe below the potential benefits of community policing as one means of enhancing police legitimacy. Community policing is perhaps the best known and certainly the most widely adopted police innovation of the past three decades (Skogan, 2006). What exactly adopting community policing entails is less clear. Definitions typically focus on three components that characterize many programs: some level of community involvement and consultation; decentralization, often increasing line-level officer discretion; and problem solving (see Office of Community Oriented Policing Services [COPS Office], 2009).

The impact of community policing on crime and disorder has been subject to debate and the effects of community consultation on crime and disorder is the focus of a current Campbell systematic review (Gill et al., in progress). Overall, prior reviews (e.g. NRC, 2004; Sherman & Eck, 2002) do not find strong evidence of community policing reducing crime and disorder (but see Connell, McGloin, & Miggans, 2008), although there is evidence that community policing programs can reduce citizen fear and increase citizen satisfaction. The observed connection between legitimacy perceptions and compliance behavior noted above suggests a possible link between community outreach efforts that increase levels of legitimacy and reduced crime. As Sherman and Eck (2002: 318) note: "The capacity of police legitimacy to prevent crime is something community policing may well be effective at creating."

For example, door-to-door visits by officers seem to be an effective approach for both increasing citizen satisfaction and reducing levels of victimization (see NRC, 2004). Wycoff, Pate, Skogan, and Sherman (1985) found that efforts by police in a target neighborhood in Houston to initiate more positive, informal contacts with citizens led to lower rates of victimization. The program focused on the quality of police-citizen interactions and so fits in well with our discussion of police concerns with procedural justice.

Aspects of community policing can be combined with some of the successful interventions described above in ways that may increase their overall effectiveness. For example, Braga and Weisburd (2010) describe a community-oriented approach to hot spots policing focused on community consultation on the tactics used in hot spots and

efforts to ensure that hot spots policing strategies do not damage police-resident relationships (see also Scheider, Chapman, & Shapiro, 2009). As Braga and Weisburd (2010: 204) note, "Dealing with hot spot locations in a collaborative and transparent way has great potential to improve police-community relations and enhance overall police legitimacy."

What Should Police Not Be Doing?

A question that is almost as important as "what should the police be doing?" is "what should the police not be doing?" Below we review areas where the research evidence is persuasive that police should not be engaging in particular strategies to reduce crime. We review a number of areas below, highlighting key studies that suggest the ineffectiveness of certain policing efforts.

"Standard Model" of Policing

We first focus on tactics referred to by Weisburd and Eck (2004) as the "standard model" of policing. These strategies are often seen as traditional police approaches to dealing with crime that developed largely during the reform or professional era beginning around the 1930s (Kelling & Moore, 1988). While these tactics are now 50 years or more old, they drive much of current police activity. They are seen as the "standard model" for

a reason. We focus here on three of the five strategies described by Weisburd and Eck (2004).

First, random preventive patrol (or random beat patrol) has shown little or no evidence of effectiveness as a crime fighting tool (see Sherman & Eck, 2002). The most influential study in this area was the Kansas City preventive patrol experiment conducted by Kelling and colleagues (1974). They found no evidence that changes in the amount of preventive patrol across beats had a significant impact on reported crime or reported victimization. Although the Kansas City study suffered from some methodological flaws (see Sherman, 1992a), the finding that police randomly patrolling beats is not an effective crime deterrent makes sense based on the review of the hot spots literature above. Hot spots policing is an effective strategy in part because it takes advantage of the fact that crime is strongly concentrated in a small number of places. Since crime is very concentrated across cities, it makes little sense from an effectiveness and efficiency standpoint to respond with a strategy relying on the random distribution of police resources across large geographic areas (see Weisburd & Telep, 2010).

A second standard policing tactic that appears to have little impact on crime is rapid response to 911 calls. Rapid response can sometimes lead to the apprehension of suspects (e.g. a call for a "hot" robbery), but there is no evidence that rapid response to most calls increases apprehension rates or decreases crime (Kansas City Police Department, 1977; Spelman & Brown, 1984). The problem is that citizens frequently wait too long to call police after an incident occurs. Police should not expect crime control gains to come simply by decreasing response times to the vast majority of calls.

In a related way, police should also not use the 911 system as an excuse for why officers cannot engage in more innovative practices. While responding to 911 calls does use a significant portion of patrol officer resources, officers typically have a substantial proportion of time on duty that is uncommitted. Famega, Frank, and Mazerolle (2005), for example, found that over 75 percent of officer time in Baltimore was unassigned, providing enough time for police to supplement 911 response with more effective tactics, such as hot spots policing.

Finally, we point to the lack of strong evidence on the effectiveness of general reactive arrest policies. Unlike some of the intensive strategies described above, more across the board increases in arrests are not particularly effective in reducing crime. As Sherman and Eck (2002: 310) note, "the evidence in support of the reactive arrest hypothesis is remarkably unencouraging at both the community and individual levels of analysis." For example, Greenberg and Kessler (1982) and Chamlin (1988) found weak and inconsistent relationships between arrests and crime in longitudinal analyses. Chamlin and Myer (2009), however, note that the social context may affect the arrest-crime relationship. It is difficult to come to any firm conclusions on the effectiveness of arrest as a strategy to address crime because of mixed evidence on interventions that rely primarily on arrest and the fact that many interventions that include increases in arrest also feature a number of other facets, and disentangling the impacts of various factors can be difficult. We see little reason to believe that more broad-based reactive arrest policies will be very effective in reducing crime, and instead we argue for greater focus, either on

high risk offenders, high risk places or both, as we discussed when describing effective policing tactics.

Arrests for cases of misdemeanor domestic violence are a subset of general arrest policies, but one that has been more extensively studied than almost any other policing tactic. Unfortunately for police practitioners, the evidence on the benefits of using arrest in domestic violence cases is decidedly mixed (Sherman, 1992b). The initial Minneapolis experiment suggested arrest could reduce recidivism (Sherman & Berk, 1984), but the success of arrest in the replication studies was more varied and depended in part on the employment status of offenders (Sherman, 1992b), a problematic criterion for officers to rely on. More than half of states have adopted mandatory arrest laws, leaving officers little discretion in the decision to arrest in cases where there is probable cause to believe a misdemeanor has occurred (Hirschel et al., 2007). Because of the unclear implications of the research evidence in this area, we do not recommend such laws and see no reason to believe that mandatory or presumptive arrest laws will have a significant impact on crime rates.

Drug Abuse Resistance Education (D.A.R.E.)

Rosenbaum summarized the research evidence on D.A.R.E. by titling his 2007 *Criminology and Public Policy* article "Just say no to D.A.R.E." As Rosenbaum describes, the program receives over $200 million in annual funding, despite little or no research evidence that D.A.R.E. has been successful in reducing adolescent drug or

alcohol use (see e.g. Becker, Agopian, & Yeh, 1992; Clayton, Cattarello, & Johnstone, 1996; Rosenbaum et al., 1994; Ringwalt, Ennett, & Holt, 1991). As Rosenbaum (2007: 815) concludes "In light of consistent evidence of ineffectiveness from multiple studies with high validity, public funding of the core D.A.R.E. program should be eliminated or greatly reduced." Recent reformulations of D.A.R.E. have not shown successful results either. For example, the Take Charge of your Life program delivered by D.A.R.E. officers was associated with significant increases in alcohol and cigarette use by program participants compared to a control group (Sloboda et al., 2009).

Second Responder Programs for Domestic Violence

Second responder programs for domestic and family violence victims involve follow-up efforts with domestic violence victims. Programs often include a home visit by teams of police officers and victim advocates or service providers to provide information on services and legal options. The goal of such programs is to reduce subsequent violence by better informing victims of their opportunities to receive social services. A Campbell review of second responder programs by Davis, Weisburd, and Taylor (2008), however, suggests these efforts are not effective in reducing violence. The programs do, on average, lead to a slight increase in reporting abuse to the police, but there is no evidence such programs reduce violent incidents and thus such programs do not seem to have any beneficial impact on crime and disorder (e.g. Davis & Taylor, 1997; Davis, Weisburd, & Hamilton, 2007). In fact, one study (Hovell, Seid, & Liles, 2006) found

significant backfire effects from a second responders program. Domestic violence victims that received a visit by the Family Violence Response Team were 1.7 times more likely to be re-abused than a comparison group.

General Implications for Policing

The evidence we have reviewed on what police should be doing suggests certain common elements of effective programs. First, a specific (rather than general) focus seems to be more effective (see also Lum et al., 2011; Weisburd & Eck, 2004). When police narrow in on specific places, types of crime, types of offenders, or mechanisms and factors contributing to crime they can more efficiently use their resources to address crime problems. Random patrol across a beat, for example, spreads limited police resources too thinly across an area without a clear crime control benefit. Second, small geographic units of analysis are usually a better target than larger geographic areas. Police do not have to ignore neighborhood-based programs, but the success of hot spots policing suggests the importance of focusing in on micro geographic units. Third, police should focus more on proactive rather than reactive tactics (see also Lum et al., 2011; Weisburd & Eck, 2004). The police should view themselves not just as a crime response agency that waits for 911 calls, but instead as a crime prevention agency that can address underlying conditions that allow crime to continue in certain areas. Fourth, police should, when possible, not rely exclusively on law enforcement and arrest to address crime and disorder (see Weisburd and Eck, 2004). While arrest is an important tool of

the police, as Goldstein (1990) argues, police can be more effective when they expand the toolbox to include other efforts to address crime such as situational crime prevention and partnerships with other agencies. This idea relates to third party policing strategies (Mazerolle & Ransley, 2005) that emphasize the police partnering with place managers and other city agencies to help address chronic crime locations.

Are The Police Doing What They Should Be Doing?

We wanted to review, with the data available, to what extent police agencies are engaging in tactics that work. We rely primarily on 2007 LEMAS data (Reaves, 2010). LEMAS includes several relevant questions on community policing, problem solving, and the use of technology.

LEMAS suggests that nearly all large departments and 56 percent of all departments provide at least eight hours of training for new officers on community policing, although it is not clear what exactly this training entails. We would encourage departments that use community policing training to focus this training on problem solving skills (e.g. the SARA model) and the importance of procedural justice and police legitimacy. In terms of their level of commitment to problem solving, we see a major difference between the largest agencies (those serving over one million residents) and all others. About two-thirds of the largest agencies actively encourage problem solving, but this drops to just 21 percent when examining all departments. These numbers are

disappointingly low when research suggests that problem-oriented policing can have a beneficial impact on crime and disorder problems.

While data on specific tactics are limited in the LEMAS survey, there are a number of questions related to police technology. Crime analysis and crime mapping in particular are very important for the successful implementation of hot spots policing and problem-oriented policing. The results overall are quite promising in large agencies, but rather disappointing in smaller departments. While over 90 percent of the largest agencies are using computers for hot spot identification, just 13 percent of departments overall are. Even in moderately sized cities (population 100,000-249,999), just 66 percent of departments use computers to identify hot spots. One hundred percent of the largest departments make use of computers for crime analysis and crime mapping, but only 38 percent of agencies overall use computers for crime analysis, and 27 percent use computers for crime mapping. The use of computers for crime mapping and analysis has increased since 2003. Research by Weisburd and Lum (2005) suggests that the use of crime mapping diffused quickly in policing from the mid-1990s through 2001, and these latest LEMAS data suggest that the use of crime mapping continues to increase, but smaller agencies are lagging behind. In terms of patrol officer access to crime data, 31 percent of the largest agencies and 11 percent of agencies overall provide offices access to crime maps in their patrol cars. Increasing these percentages would likely aid in making hot spots policing a more routinized part of policing practice.

The PERF (2008) survey of 176 policing agencies of various sizes shows 63 percent used hot spots policing to reduce violent crime. This was by far the most popular

response to the question of how to address violence. When asked what sort of places the agency defines as a hot spot, the majority of respondents noted addresses or intersections (61 percent) or clusters of addresses (58 percent). However, a majority of respondents (57 percent) also identified neighborhoods as potential hot spots and a sizable minority pointed to patrol beats (41 percent) as the sort of place that would be defined as a hot spot. These larger geographic areas are less likely to lead to the same crime control benefits as narrowing in on small geographic units. When asked what tactics they used at hot spots, a majority of respondents mentioned tactics we have previously discussed as effective ones. These results are encouraging, but still suggest that nearly 40 percent of surveyed agencies are not using hot spots policing to address violent crime.

Conclusions

There is an emerging evidence base on "what works" in policing and we now have a series of Campbell systematic reviews on policing topics as well as other comprehensive narrative reviews of the police evaluation literature. We examined these reviews to provide assessments of what police should be doing and what they should not be doing and attempted to use the available research to provide some guidance to agencies on how to properly implement effective strategies and tactics. We conclude here by first noting some limitations in our currently available evidence base. This can be seen as a list of areas where we do not know enough to make firm recommendations.

We then conclude with some brief remarks on the future of police efforts to address crime and disorder.

What Do We Not Know Enough About?

We know too little to reach firm conclusions about a number of areas important to police work. Perhaps the most prominent policing strategy in this area is broken windows policing (see Wilson & Kelling, 1982). Much of the research on broken windows has focused on New York City and its citywide approach to policing disorder under Commissioner Bratton (Kelling & Coles, 1996). Crime declined substantially in New York in the 1990s, but estimates of the size of the role broken windows policing played in this decline have ranged from large (Bratton & Knobler, 1998, Kelling & Sousa, 2001) to significant but smaller (Messner et al., 2007; Rosenfeld, Fornango, & Rengifo, 2007) to non-existent (Harcourt & Ludwig, 2006).

A major problem in most of these analyses is the focus almost exclusively on misdemeanor arrests as a proxy for New York's broken windows policing efforts. While following the broken windows model did lead to substantial increases in misdemeanor arrests, as Kelling and Coles (1996) note, misdemeanor arrests alone oversimplify a much more nuanced approach to policing disorder. As opposed to a zero-tolerance policy focused only on arrest, Kelling and Coles (1996) describe a more community-oriented approach to partnering with residents and community groups to tackle disorder collectively in a way that still respects the civil liberties of offenders. Whether the NYPD was able to adopt this model successfully remains up for debate (e.g. see Greene, 1999),

but it does suggest that the intervention is complex and difficult to evaluate, particularly because broken windows policing was adopted citywide simultaneously.

An additional area where current studies have not yet been conclusive is the impact of increasing department size. Marvell and Moody (1996) note that in 78 prior assessments of the link between number of police and crime from 36 studies, just 14 found a significant beneficial impact of more police. However, they also detail the difficulties of disentangling the relationship between crime and number of officers because of specification problems. Their own analyses suggest a significant impact of police levels on crime, particularly at the city level. Evans and Owens (2007: 183) point to methodological improvements of recent studies that examine the relationship between police and crime and find a beneficial effect (see Levitt, 2004), but conclude, "Even with these recent efforts, there is scant evidence that more police reduce crime." Kleck and Barnes (in press) find little relationship between levels of police and general deterrence or incapacitation, calling into question traditional arguments for why more police may lead to less crime.

Related to department size, studies of the impact of hiring grants from the COPS Office on crime are not uniform in their results. The Government Accountability Office's (2005) assessment of COPS grants suggested the program was responsible for about 5 percent of the 26 percent drop in total crime between 1993 and 2000. Other studies found conflicting results, some suggesting a relationship between the grants and crime declines (see Evans & Owens, 2007; Zhao, Scheider, & Thurman, 2002) and others finding little or no impact of the grants on crime rates (see Muhlhausen, 2001; Worrall &

Kovandzic, 2007). Based on these findings from studies of both the number of police in general and police hired by COPS grants, we find it difficult to reach strong conclusions about the relationship between levels of police and crime.

The impact of detectives on crime is also a topic worthy of further research. General follow-up investigations by detectives in non-homicide cases were seen as ineffective by Weisburd and Eck (2004), but we believe we have too little evidence on the work of detectives to provide a full assessment of their effectiveness. Braga, Flynn, Kelling, and Cole (2011) have recently called for a greater focus on the potential crime control benefits of detectives, and this is a promising area for future research.

Finally, we note the conflicting evidence for certain community policing programs. For example, it had generally been thought that foot patrol helped reduced fear of crime but not actual crime (e.g. Police Foundation, 1981), but a recent study in Philadelphia suggests foot patrol might also have the potential to reduce violent crime significantly when focused in on crime hot spots (Ratcliffe et al., 2011). Research on the effectiveness of neighborhood watch has also been mixed. Sherman and Eck (2002) concluded neighborhood watch does not work, but a Campbell systematic review by Bennett, Holloway, and Farrington (2008) concluded that neighborhood watch is associated with significant crime declines.

Our current evidence base also limits to some extent the generalizations we can make. Most policing evaluation research examines policing in large urban areas, although we still believe that even smaller departments can learn from the lessons of larger agencies, particularly the importance of using focused interventions in micro

geographic areas. It is also the case that we know little about the differential impacts of policing interventions across varying community contexts. Does hot spots policing work better in certain kinds of environments? Does the socioeconomic status or racial composition of a place affect the effectiveness of POP? Finally, we recognize the need for longer follow-ups in policing studies. We know very little about the long-term impacts of most policing innovations.

We also need better data on what agencies are doing in the field. LEMAS is limited in providing data on what departments are actually engaged in day-to-day. Because it is a massive national survey, there are limits to the number of questions that can be asked about daily practices, and even with additional questions, the LEMAS data reflect the survey responses of only certain individuals in the department. Qualitative studies such as Willis, Mastrofski, and Weisburd's (2007) assessment of Compstat in three departments can provide greater insight into what policing looks like day-to-day, and we encourage further qualitative or mixed methods studies to better assess to what extent departments are engaging in the strategies we recommend here.

The Future of Policing

Our review here suggests a number of areas where the evidence base is currently sufficient to make recommendations to police practitioners on strategies that can effectively reduce crime and disorder. We argue police should be focusing on hot spots policing, problem-oriented policing, focused deterrence approaches, directed patrol to reduce gun crime, using DNA in property crime cases, and efforts to enhance legitimacy.

In contrast, police should be avoiding standard policing tactics such as random preventive patrol, second responder programs, and D.A.R.E.

More generally, police today should ensure that new strategies and approaches are grounded in the existing literature on what is effective. This means drawing upon approaches that have been proven to work. A major goal then for the future of policing is relying more on rigorous evidence to guide practice (see Weisburd & Neyroud, 2011). We strongly advocate for continued growth in the number of rigorous studies evaluating policing strategies, particularly in the areas above where we do not know enough to make strong recommendations. Still, with the evidence base today police can be increasingly evidence-based in addressing crime and disorder. Such a focus is critical in a time of diminishing resources in policing.

CHAPTER THREE: WHAT HAS BEEN LEARNED FROM SYSTEMATIC REVIEWS IN POLICING[10]

There is a growing evidence base of rigorous studies evaluating policing interventions (see Lum, Koper, & Telep, 2011) and a series of systematic reviews that have synthesized many of these studies (see below). Just a few years ago, there were almost no systematic reviews available about policing, and narrative reviews provided the dominant approach for understanding police practices. As we show below, we now have 16 completed or in progress systematic reviews of police practices. It is in our view now useful to conduct a "review of the reviews" to assess what we have learned, questions that remain unanswered, and how we can best move forward with systematic reviews of policing.

Systematic reviews have become an important tool for synthesizing what we know about various topics in criminal justice and have served to help inform researchers, policymakers, and practitioners about what does and what does not work. Policing reviews appear to have been influential in policymaking and policing circles. The Office of Community Oriented Policing Services (COPS), for example, announced a continued partnership with the Campbell Collaboration to publish practitioner-friendly guides on

[10] This chapter will appear in an edited book published by Springer. Original citation: Telep, C. W., & Weisburd, D. (Forthcoming).What has been learned from systematic reviews in policing? In D. P. Farrington & D. Weisburd (eds.), *Systematic reviews in criminology: What have we learned?* New York: Springer.

systematic reviews relevant to the police. Nine guides are currently available.[11] The National Policing Improvement Agency (NPIA) in the United Kingdom has provided funding for nine systematic reviews and a systematic search. A number of the policing reviews discussed below were originally presented at the Jerry Lee Crime Prevention Symposium in Washington, DC,[12] which brings together more than 100 academics, policymakers, and police officials annually. The Campbell library of systematic reviews is also listed as a resource on the Department of Justice's CrimeSolutions.gov website, designed to help inform policymakers and practitioners on what works in policing and criminal justice. The rise in systematic reviews in policing over the past decade represents an important advance in policing research and taking stock of what has been learned seems important at this juncture.

In this chapter we first provide an overview of our search strategy for identifying relevant systematic reviews. We then provide brief summaries of our included reviews. We next turn to lessons learned from the findings of these reviews, focusing our attention on what works, what seems not to be effective, and what seems promising for both crime control effectiveness and increasing fairness and legitimacy in policing. We then discuss what important questions remain unanswered with these reviews, focusing on both the need for more rigorous research and areas of policing where a review might be useful. We next turn to problems encountered with the existing reviews. Finally, we conclude with some thoughts on lessons the police can learn from systematic reviews and our recommendations for the future of systematic reviews on policing.

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[11] See http://www.cops.usdoj.gov/Default.asp?Item=2614
[12] See http://gunston.gmu.edu/cebcp/JerryLee.html

Search Strategy

We sought to identify any systematic reviews on policing topics that used inclusion criteria ensuring that only more rigorous studies (i.e. randomized experiments and quasi-experiments, preferably with a comparison group) were eligible. While we suspected most of the reviews would focus on crime-related outcomes, we did not limit our search to any particular outcome measure. We did require, however, that reviews feature some sort of intervention or police action that would be associated with an outcome measure. In other words, we were interested in the impact of police programs, training, interventions, or activities on outcome measures. We also only included reviews that featured exclusively or primarily studies where the police played a significant role in the intervention under review.

We began by examining the Campbell Collaboration Crime and Justice library, which provided us with 11 published and two in-progress reviews related to policing. We do not include reviews here that have some relevance to policing (e.g. Bennett, Holloway, & Farrington, 2008; Farrington & Ttofi, 2009; Lum, Kennedy, & Sherley, 2006; Welsh & Farrington, 2008), but are not primarily focused on police practices.[13] We next searched the Cochrane Collaboration library for any reviews related to policing. We found one relevant review (Goss et al., 2008) that we included. We considered including the school-based drug prevention review by Faggiano and colleagues (2008),

[13] These reviews will also be covered in other chapters in the edited volume.

but because only two of the eligible studies included police and these were part of another review we identified (see below) we excluded this review.

We then searched online databases to attempt to identify additional relevant reviews.[14] We identified several articles described as "systematic reviews" but only two met our inclusion criteria:[15] a systematic review of Drug Abuse Resistance Education (D.A.R.E.) by West and O'Neal (2004) and a systematic review of police efforts to reduce traffic accidents by Blais and Dupont (2005). This left us with a total of 16 completed or in-progress systematic reviews for analysis. We summarize these reviews below.

Data Sources

We begin with a discussion of existing systematic reviews on policing, both completed and in progress. While available space limits our ability to describe each of these reviews in detail, we provide brief information on the purpose and findings of each of these reviews. More information on each completed review is available in Table 1, Table 2, and Table 3 discussed below.

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[14] We searched Criminal Justice Abstracts, Criminal Justice Periodical Index, Sociological Abstracts, and Google Scholar for "systematic review" AND police OR policing. Because Google Scholar produced over 16,000 hits, we only examined the first 500.

[15] Excluded reviews included a systematic review of the criminal profiling literature that only summarized the state of the literature but did not include interventions (Dowden, Bennell, & Bloomfield, 2007), systematic reviews of weak studies methodologically on police use of improper force (Harris, 2009) and the effects of drug law enforcement on violence (Werb et al., 2011), a systematic review of factors related to police suicide that again did not include any sort of intervention (Hem, Berg, & Ekeberg, 2011), and a systematic review of interventions to reduce problems around bars that included mostly non-police interventions (Brennan et al., 2011).

In the last five years or so, there has been a massive increase in the number of systematic reviews related to policing. We describe some 16 policing reviews below. None of these were completed before 2004,[16] and 10 were proposed or completed after 2010. This expansion in the number of policing-related reviews is due in part to recent funding from the NPIA. As noted earlier, the NPIA provided financial support to a number of Campbell Collaboration reviews on policing or policing-related topics, eight of which we included in this chapter.[17] We begin by discussing the reviews that showed positive results and then discuss those where the programs studied showed little evidence of effectiveness.

Reviews with Positive Results[18]

Hot spots policing

Braga, Papachristos and Hureau (2012; see also Braga, 2007) examined the effectiveness of police efforts to target small geographic units with high rates of crime. The updated hot spots review found a number of additional studies not included in Braga's (2007) original review. Their meta-analysis of experimental studies found an overall mean Cohen's d of 0.184 (equivalent to an odds ratio of 1.396), suggesting a significant benefit of the hot spots approach in treatment compared to control areas. Of the 25 comparisons from 19 eligible studies, 20 showed notable crime declines as a result

[16] While Campbell did not publish Anthony Braga's hot spots review until 2007, the initial narrative findings were published in a 2001 article and the initial meta-analysis in a 2005 article.
[17] See a list at: http://cebcp.org/systematic-reviews/current-projects/
[18] Because it remains in progress, we do not include Strang and Sherman's (2004) review of the effects of restorative justice programs. Some preliminary meta-analyses by Sherman and colleagues (2005) suggest the benefits of restorative justice in terms of victim satisfaction, but a full Campbell review of the impacts of restorative justice, particularly on re-offending, has not yet been completed

of the hot spots intervention. As we discuss later, we also must be cautious in interpreting the magnitude of effect sizes from place-based interventions like hot spots policing, because crime declines in places may have a greater substantive impact than person-based crime (or recidivism) declines Braga's (2007: 18) conclusion that "extant evaluation research seems to provide fairly robust evidence that hot spots policing is an effective crime prevention strategy" remains true in the updated review (see Braga et al., 2012).

Focused deterrence strategies

Braga and Weisburd (2012b) examined the impact of focused deterrence strategies. Many of these strategies employ the "pulling levers" framework popularized in Boston with Operation Ceasefire (Braga et al., 2001), in which gangs were notified that violence would no longer be tolerated and if violence did occur, every available legal lever would be pulled to bring an immediate and certain response. They found such approaches have significant beneficial impacts on crime, particularly violent crime. Nine of the 10 eligible studies showed significant positive impacts on crime. One concern is that there were no randomized trials included in the review, in part because of the difficulty of evaluating focused deterrence strategies in a randomized experimental framework (i.e. many of the interventions are either citywide or in areas that are so unique in the jurisdiction that there is no reasonable comparison group).

Problem-oriented policing (POP)

Weisburd, Telep, Hinkle, and Eck (2008) examined the effectiveness of interventions that use the SARA model (scanning, analysis, response, assessment; see Eck & Spelman, 1987) for a problem-oriented policing intervention. Based on their meta-analysis, problem-oriented policing has a modest but statistically significant impact on reducing crime and disorder. The authors also collected more numerous but less rigorous pre/post studies without a comparison group. Results of these studies indicate an overwhelmingly positive impact of POP.

Strategies to reduce illegal possession and carrying of firearms

Koper and Mayo-Wilson (2006, 2012) examined the impact of police strategies to reduce the illegal possession and carrying of firearms on gun crime. They found a small number of eligible studies (and no randomized experiments), but their overall results suggest directed patrol in high gun crime areas can have a significant impact on reducing gun-related crime. These directed patrol strategies involve increasing officer enforcement and proactivity at these high crime areas. Koper and Mayo-Wilson (2006, 2012) caution though that these results are based only on a small number of comparisons, and because of the heterogeneity across studies, they did not undertake a meta-analysis.

DNA testing in investigative work

Wilson, Weisburd, and McClure (2011) looked at the use of DNA testing in police investigations in order to increase the identification of offenders, as well as arrests,

convictions, and case clearances. They found only a small number of eligible studies, but generally the use of DNA evidence was beneficial in investigations across multiple categories of crime. The evidence base for more serious crimes is particularly weak though, while the strongest evidence comes from a multi-site study on the use of DNA testing in property crime cases (see Roman et al., 2009). Across the five sites in that study, the use of DNA evidence as opposed to traditional investigatory techniques was associated with large increases in the number of suspects identified, arrested, and prosecuted.

Drug law enforcement

Mazerolle, Soole, and Rombouts (2007) evaluated police-led drug enforcement programs, focusing in particular on whether more innovative approaches are more effective than traditional policing strategies (such as random preventive patrol). They find overall evidence of effectiveness in terms of reducing drug calls for service and incidents for problem-oriented approaches and "community-wide" approaches compared to intensive police efforts at drug hot spots. Community-wide efforts refer to interventions encouraging police-community collaboration as a means to address drug problems in neighborhoods. For non-drug calls and incidents, community-wide interventions were particularly effective in reducing disorder and intensive hot spots approaches were most effective for addressing serious property and violent crime. The authors conclude that multi-agency and multi-partner interventions that do not make use

of exclusively intensive law enforcement are most likely to be successful in addressing drug markets (see similar conclusions in an earlier review by Mason & Bucke, 2002).

Micro displacement in police interventions

Bowers, Johnson, Guerette, Summers and Poynton (2011) did not focus on a single policing intervention, but instead examined the extent to which displacement is likely as a result of geographically focused police interventions. They found that overall, geographically focused police interventions tended to show a main effect in favor of treatment, and in areas surrounding the treatment area there tended to be no significant evidence of crime displacement. The data were more supportive of a diffusion of crime control benefits (Clarke & Weisburd, 1994) to areas nearby than displacement. Overall, they conclude that displacement is not an inevitable outcome of focused policing interventions.

Police patrols to prevent drunk driving

Goss and colleagues (2008) examined the effects of increased police patrols to prevent drunk driving in a Cochrane Collaboration review. The authors conclude that increased patrols generally reduce the number of traffic accidents and fatalities resulting from drunk driving, but note that the poor methodological quality of most studies makes drawing strong conclusions very difficult. The authors lament the fact that although millions are spent annually on police efforts to target drunk drivers so little high quality research on the topic has been undertaken.

Intensive police programs to reduce traffic accidents

Blais and Dupont (2005) examined a number of different police interventions to address traffic accidents, as well as driving while intoxicated (DWI) and speeding. These included random breath testing, sobriety checkpoints, random road watch, red-light cameras, speed cameras, and multi-component programs. While this review included some quasi-experiments without a comparison group, the overall results were very positive. Thirty of the 33 included studies showed reductions in traffic accidents with injuries. In a related systematic review, Elder and colleagues (2002) found that sobriety checkpoints for drunk driving were associated with reductions in traffic accidents and traffic deaths.[19] This was true whether officers used random breath testing checkpoints (officers give breath tests to all drivers) or selective breath testing checkpoints (officers only test drivers they believe have been drinking).

Reviews with Promising Results

Community policing

Gill, Weisburd, Bennett, Vitter, and Telep (in progress) are examining the impact of community policing on crime and disorder, fear of crime, legitimacy, and citizen satisfaction. Their results suggest a small but significant impact of community policing on crime and disorder, a larger significant positive impact of community policing programs on citizen satisfaction and perceived levels of legitimacy, and a significant

[19] We did not include this review because all but one of the most rigorous studies captured in this review were also included in the Blais and Dupont (2005) review.

improvement in citizen perceptions of disorder. These results suggest that while community policing may have a small impact on crime in the short-term, there could be a more substantial longer-term positive relationship through increased levels of legitimacy and satisfaction (see Gill et al., 2011).

Interview and interrogation techniques

Meissner, Redlich, Bhatt, and Brandon (2012) assessed police interview and interrogation techniques to determine which method of interrogation is more successful in maximizing valid confessions from suspects and minimizing false confessions. They compared the accusatorial method common in the United States to the less confrontational information-gathering method common in the United Kingdom. Field studies suggested that both methods increased the likelihood of confessions compared to general questioning methods. Laboratory experiments, however, revealed that information-gathering methods reduced false confessions and in certain instances increased the likelihood of true confessions, while accusatorial methods made false confessions more likely.

Interventions to increase legitimacy

Mazerolle, Bennett, Davis, Sargeant, and Manning (2013) examined police interventions designed to enhance procedural justice and/or increase citizen perceptions of police legitimacy. They focused on interventions that either explicitly focused on increasing legitimacy or incorporated at least one component of procedural justice

(participation, neutrality, dignity/respect, trustworthy motives). Their findings suggest the promise of police efforts to enhance legitimacy. There was strong evidence such interventions increased citizen satisfaction, compliance and cooperation, and levels of procedural justice. The overall effect of these programs on perceptions of legitimacy was large, but not statistically significant, indicating variability across studies. The impact of these interventions on reducing reoffending was also mixed.

Macro displacement

Weisburd, Telep, Teichman, Gill and Vitter (in progress), like Bowers et al. (2011), are examining the likelihood of displacement in policing and other criminal justice interventions. Their focus, however, is on units of geography larger than crime hot spots, what might be called macro- or meso-level displacement. Their preliminary findings suggest a lack of research at very large units of geography (e.g. jurisdictions), but at more medium sized units (e.g. neighborhoods, police beats), displacement is not very likely and a diffusion of crime control benefits is a more likely occurrence (see Telep et al., 2011).

Reviews with Limited Evidence of Effectiveness

Drug Abuse Resistance Education (D.A.R.E.)

West and O'Neal (2004) examined 11 published studies of Drug Abuse Resistance Education (D.A.R.E.), a school-based drug education program delivered by police officers. Their overall results suggest D.A.R.E. has little or no impact on drug use,

alcohol use, or tobacco use. These results are in line with an earlier meta-analysis by Ennett and colleagues (1994), which found that D.A.R.E. shows little evidence of effectiveness in reducing drug use, particularly in the long-term.

Second responder programs for domestic violence

Davis, Weisburd, and Taylor (2008) assessed the impact of second responder programs for victims of domestic and family violence. These programs involve follow-up services for domestic violence victims usually from a team consisting of a police officer and a victim advocate. Davis and colleagues (2008) found that such programs do not reduce the likelihood of future violence reported either to police or on victimization surveys. There was some evidence that those receiving second responder services reported slightly more violence to police. It is not entirely clear if this represents a backfire effect or victims having greater confidence in the police.

Stress management training for police

Patterson, Chung, and Swan (2012) examined the effects of stress management and development programs on stress-related outcomes for police officers. They found that overall stress management interventions did not have a significant impact on psychological, behavioral, or physiological outcomes. The authors caution that the low methodological rigor of the studies limits the conclusions they can reach, and there is considerable heterogeneity across the studies in the particular components that made up each stress management program. The lack of positive findings are a concern, as

Patterson et al. (2012) note, because it is clear that stress has negative consequences for officers.

Lessons Learned

Collectively, these systematic reviews can help us to identify both effective and ineffective strategies and tactics. While the systematic reviews do not focus exclusively on crime control outcomes, we have the most data on outcomes related to crime control, and so that will be the primary focus of the section below. We also examine, to the extent possible, the impact of interventions on perceptions of police legitimacy. Enhancing police legitimacy and ensuring fairness are also primary goals of the police (NRC, 2004). While we think it important to also develop the evidence base on additional outcomes (e.g. fear of crime, cost-effectiveness), the available data limit our discussion to crime and disorder and legitimacy.

What Works?

In Figure 1, we present a forest plot with mean effect sizes for all of the systematic reviews where a meta-analysis on a crime-related outcome was available. All of these effects have been converted to odds ratios, where an odds ratio of greater than 1 indicates a crime decline. This is not a meta-analysis of meta-analyses, because we are not interested in a mean effect size, but we do think it useful to display graphically what we see overall about different policing strategies that have been the subject of a

systematic review. Not all of the reviews we described above are included, largely because some of these reviewers chose not to use meta-analysis because of limited eligible studies and/or the heterogeneity of these studies.

Review	Outcome	Statistics for each study			
		Odds ratio	Lower limit	Upper limit	p-Value
Focused Deterrence	DMI	3.317	1.555	7.072	0.002
Focused Deterrence	Gang/Group	4.042	2.573	6.348	0.000
Focused Deterrence	Individual	1.401	1.144	1.716	0.001
Focused Deterrence	Mean Effect	2.991	1.884	4.748	0.000
Hot Spots Policing	Increasing Police	1.227	1.088	1.385	0.001
Hot Spots Policing	Mean Effect	1.396	1.233	1.581	0.000
Hot Spots Policing	POP	1.523	1.280	1.813	0.000
Problem-Oriented Policing	Largest Effect	1.711	1.500	1.951	0.000
Problem-Oriented Policing	Mean Effect	1.257	1.063	1.485	0.007
Street-Level Drug Enforcement	Drug Calls for Service	1.330	1.071	1.652	0.010
Street-Level Drug Enforcement	Drug Offenses	1.530	0.749	3.126	0.243
Street-Level Drug Enforcement	Total Calls for Service	1.180	1.075	1.296	0.001
Street-Level Drug Enforcement	Total Offenses	1.090	0.968	1.227	0.155
Community Policing	Mean Effect (Crime)	0.916	0.800	1.049	0.204
Second Responders	Reports on Survey	0.963	0.745	1.243	0.771
Second Responders	Reports to Police	0.863	0.631	1.180	0.357

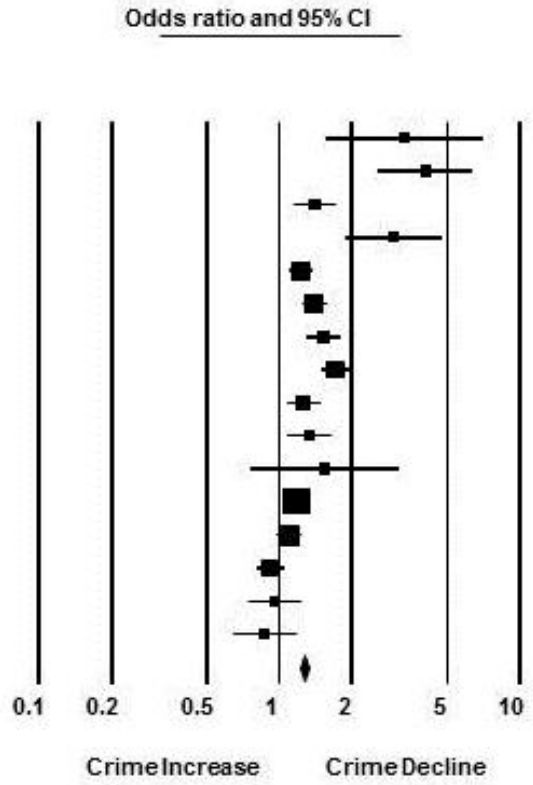

Figure 1 Forest plot of mean effect sizes for reviews examining crime-related outcomes

Figure 1 reveals the largest overall mean effects come from the focused deterrence review (Braga & Weisburd, 2012b). The largest effect in the plot is for the gang/group studies (e.g. Braga et al., 2001), which have a large odds ratio of 4.042. While the effect is large and highly significant, we urge some caution because, as we noted earlier, none of the studies in this review is a randomized experiment. Hot spots policing (Braga et al., 2012) also shows significant positive effects, particularly studies that use problem-oriented policing in crime hot spots. Of the 25 comparisons from 19 eligible studies, 20 showed notable crime declines as a result of the hot spots intervention. The mean odds ratio for these studies was 1.396. The significant crime control benefits of hot spots policing found in meta-analyses are in line with the narrative review by the NRC (2004) that argued that existing research evidence most strongly supported the effectiveness of hot spots policing. Although not included in Figure 1 because Koper and Mayo-Wilson (2006) did not conduct a meta-analysis, directed patrol strategies to reduce gun violence, which in some sense are a hot spots strategy in somewhat larger areas, also show evidence of effectiveness.

Problem-oriented policing (Weisburd et al., 2008) overall shows a modest but significant mean odds ratio of 1.257. As noted earlier, the less rigorous studies collected in the review showed more strongly positive results. It appears that combining problem-oriented policing with hot spots policing is a particularly effective approach. Additionally, the Mazerolle et al. (2007) drug enforcement review found POP strategies in drug markets to be an effective strategy. The Mazerolle et al. (2007) review reports a

large number of mean effect sizes based on type of intervention, but based on Figure 1, it appears such efforts are most successful at reducing drug calls for service (and to a lesser extent drug offenses, where the effect is not statistically significant).

The evidence also suggests the effectiveness of DNA in police investigations, particularly in property crime cases where DNA tends to be used less frequently. The findings of the Roman et al. (2009) multi-site experiment and the Wilson et al. (2011) review suggest using DNA evidence can be a cost-effective means to identify, arrest, and convict more offenders.

These results overall suggest a very different portrait of the effectiveness of policing than even as recently as the early 1990s, when it was widely believed that the police were ineffective crime fighters. David Bayley (1994: 3), for example, began his book *Police for the Future* with a chapter on "The Myth of Police" and a powerful first sentence: "The police do not prevent crime." But over the last two decades there has been a dramatic change in the underlying conclusions that scholars have reached regarding the effectiveness of the police in reducing crime. Our results suggest a number of effective policing programs focused on reducing crime and disorder.

What Seems to Have Little or No Effect?

Figure 1 also suggests the overall less supportive evidence for second responder programs. For second responder programs (Davis et al., 2008), neither of the mean effects are statistically significant, but both suggest that victims receiving second responder services reported more subsequent abuse than comparison victims.

Additionally, stress management programs for police do not have strong evidence of effectiveness, based on the Patterson et al. (2012) review. Because of variation across programs and the multi-faceted nature of most of the interventions, it is difficult to determine what exactly is causing these programs to be ineffective, but greater efforts are needed to better address the very important problem of police stress. Finally, D.A.R.E. programs also show little effect in reducing adolescent alcohol, cigarette, and drug use (West & O'Neal, 2004).

What's Promising?

The review by Meissner and colleagues (2012) suggests the potential benefits of a shift in interrogation techniques in investigations. While the accusatorial model dominates U.S. detective work, the findings of the Meissner et al. (2012) review suggest the potential negative consequences of this approach in terms of increased false confessions, which raises important concerns about both fairness and efficiency. The information-gathering method, more common in the United Kingdom, relies on establishing rapport with the suspect, obtaining the suspect's side of the story, and using honesty and clarity to carefully gather information during the interrogation. This approach is promising for both increasing true confessions and reducing false ones. Police programs designed to help increase procedural justice and citizen perceptions of legitimacy also seem promising. Although the Mazerolle et al. (2013) review had a small number of rigorous studies, a number of different strategies including training, directives, and a range of interventions appear promising for enhancing legitimacy. When police

incorporate at least one component of procedural justice into daily routines or as part of a special program, they tend to see benefits in terms of citizen satisfaction, cooperation, and perceived fairness. Research suggests that when citizens perceive the police as more legitimate, they are more likely to cooperate with police and comply with the law (see Tyler, 2004). Indeed, the information-gathering method of interrogation described above is grounded in the importance of using procedural justice as a means to ensure suspect cooperation with the investigation (see Meissner et al., 2012).

Finally, as noted above, the results from the community policing review suggests a small but significant positive impact on crime, as indicated by the odds ratio greater than 1 in Figure 1 (Gill et al., in progress). Community policing also has a more substantial significant positive impact on citizen satisfaction and citizen perceptions of legitimacy. This suggests that community policing programs may be one way for the police to incorporate principles of procedural justice into their interactions with citizens and as a result improve police-community relations. Based on Tyler's (2004) process-based model, it could be the case that community policing is a more effective crime control program in the long-term, as enhanced citizen perceptions of police legitimacy may contribute to increased compliance with the law and reduced crime.

What Do the Reviews Cover and What Areas Are Absent?

Our assessment of systematic reviews in policing suggests we have reviews on quite an array of issues of concern to policing. In Table 1, Table 2, and Table 3 we

provide a summary of the previous sections, with additional information on all of the completed reviews. We also note here the number of eligible studies, and how many of these studies were randomized experiments. We are particularly interested in the methodological quality of the included studies in each review. While high quality systematic reviews typically have strict inclusion criteria with minimum standards for methodological rigor, most quasi-experimental designs do not have the same level of internal validity as randomized experiments, which are typically recognized as the strongest research design in evaluation research (see Boruch, Snyder, & DeMoya, 2000; Cook & Campbell, 1979; Weisburd, 2003).

Some of the systematic reviews are drawing upon a large base of highly rigorous studies. The hot spots review (Braga et al., 2012), for example includes 10 randomized experiments and nine quasi-experiments with a comparison group. In other areas though, the evidence points to the effectiveness of particular interventions, but the rigor of this evidence could be stronger. In the focused deterrence review (Braga & Weisburd, 2012b), for example, there are no randomized experiments. The same is true for the review of directed patrol to reduce gun violence (Koper & Mayo-Wilson, 2006, 2012). While the quasi-experimental evidence in both of these reviews is consistent with a treatment effect, the lack of experimental trials limits our ability somewhat to reach strong conclusions regarding effectiveness.[20] In the problem-oriented policing review

[20] We recognize that some non-experimental studies can provide very credible results. For example, regression discontinuity designs (e.g. see Cook, Shadish, & Wong, 2008), or propensity score matching with very systematic knowledge of underlying causal structures and rich data to account for them (e.g. see Shadish, Clark, & Steiner, 2008) have been found to provide outcomes similar to randomized designs. Nonetheless, the bulk of the non-experimental designs in these policing reviews were much weaker quasi-experimental comparisons.

(Weisburd et al., 2008), the problem is not a lack of randomized experiments (four of the 10 eligible studies were randomized trials). However, because of the range of different problems police address using problem-oriented approaches and the multitude of different possible responses, the available evidence made it difficult to reach strong conclusions about the relative effectiveness of different approaches. It is no surprise then that almost all of the systematic reviews on policing conclude by noting the need for additional rigorous research.

Overall, there are 251 studies across the 14 reviews in Table 1, Table 2, and Table 3. Some of these studies are repeats, as a single study may appear in multiple reviews (e.g. Weisburd & Green, 1995 appears in the hot spots review, the problem-oriented policing review, the drug law enforcement review, and the micro displacement review). Removing overlapping studies, there are 225 total studies covered in the completed reviews. This overlap raises important questions of what aspects of particular interventions are driving their success (or lack of success). Ignoring the overlap for a moment, 55 of these studies are randomized experiments and 196 are quasi-experiments (typically, although not always, quasi-experiments with a comparison group). Thus, fewer than 25 percent of the studies included in systematic reviews on policing are randomized experiments. When we focus on the non-repeat studies, 44 of the 225 total studies (19.6 percent) are randomized experiments. While we think it is noteworthy that these reviews are drawing from more than 200 rigorous primary studies in policing, and that there are a large number of randomized experiments in policing evaluations, it is still

the case that randomized experiments are much outnumbered by other evaluation methods.

Table 1 Intervention, outcome measures, study designs, and search characteristics in completed policing reviews

Researchers (Date)	***Intervention***	***Comparison Group***	***Outcome***	***Design***	***Searches***	***Time Period***
West & O'Neal (2004)	Drug Abuse Resistance Education (D.A.R.E.)	Students not receiving D.A.R.E.	Alcohol use, drug use, tobacco use	Randomized experiment or quasi-experiment with comparison group	Online databases, references of acquired studies	1991-2002
Blais & Dupont (2005)	Intensive police programs to prevent traffic accidents	Generally geographic areas not receiving the police program; some before/after studies	Accident with injuries, proxy measures of driving while intoxicated or speeding	Randomized experiment, quasi-experiment with comparison group, or interrupted time series	Not described	1990-2004
Mazerolle, Soole, & Rombouts, (2007)	Drug law enforcement	Geographic areas receiving "standard model" of policing	Drug offenses, drug calls for service (CFS), property offenses, property CFS, violent offenses, violent CFS, overall offenses, overall CFS, social disorder	Randomized experiment or quasi-experiment with comparison group	Online databases, hand searches of journals, review of bibliographies, search of agency websites	1990-2001
Weisburd, Telep, Hinkle, & Eck (2008)	Problem-oriented policing	Comparison group of probationers in 2 studies, in all others geographic	Crime (type varied by study) or recidivism	Randomized experiment or quasi-experiment with comparison group	Online databases, agency publication	1993-2006

		area not receiving police treatment			searches, hand searches of journals, forward searches, review of bibliographies, contacted experts	
Davis, Weisburd, & Taylor (2008)	Second responder programs for domestic violence	Domestic/family abuse victims not receiving second responder team	Reported abuse to police, reported abuse in survey	Randomized experiment or quasi-experiment with comparison group	Online databases, review of bibliographies, hand searches of journals, review of Violence Against Women website, contacted experts	1992-2007
Goss et al. (2008)	Police patrols for drunken driving	Geographic areas not receiving increased police presence	Automobile accidents and injuries from accidents	Randomized experiment or quasi-experiment with comparison group, interrupted time series	Online databases, review of bibliographies, hand searches of conference abstracts, contacted experts	1976-2003

Bowers, Johnson, Guerette, Summers, & Poynton (2011)	Micro displacement in focused police interventions	Geographic area not receiving focused policing strategy; sometimes have catchment areas surrounding comparison site(s) for assessing displacement	Main crime control effect, displacement of crime, diffusion of crime control benefits	Randomized experiment or quasi-experiment with comparison group	Online databases, review of bibliographies, forward searches, search of professional agencies, hand searches of journals, contacted experts	1971-2010
Wilson, Weisburd, & McClure (2011)	DNA for police investigations	Generally cases in which DNA evidence was not used	Variation across studies, generally clearing cases or identifying suspects	Randomized experiment or quasi-experiment with comparison group	Online databases, Home Office, contacted experts	1998-2008
Braga & Weisburd (2012b)	Focused deterrence strategies (pulling levers)	Generally geographic area not receiving police attention (other neighborhoods or similar cities)	Crime (typically gun homicides or assaults)	Randomized experiment or quasi-experiment with comparison group	Online databases, review of bibliographies, forward searches, hand searches of journals, contacted experts	2001-2010
Braga,	Hot spots	Hot spots not	Crime,	Randomized	Online	1989-

Papachristos, & Hureau (2012)	policing	receiving extra police attention	displacement and diffusion effects	experiment or quasi-experiment with comparison group	databases, review of bibliographies, forward searches, hand searches of journals, contacted experts	2011
Patterson et al. (2012)	Stress management programs (wide variation in interventions)	Police officers (and sometimes civilians) not receiving stress management program	Psychological outcomes, physiological outcomes, behavioral outcomes	Randomized experiment or quasi-experiment with comparison group	Online databases, hand searches of journals, websites searches, review of bibliographies, forward searches, contacted experts	1986-2008
Koper & Mayo-Wilson (2006, 2012)	Interventions to reduce gun carrying	Geographic areas not receiving police attention or days intervention not operating	Gun crime	Randomized experiment or quasi-experiment with comparison group	Online databases, agency publication searches, review of bibliographies	1995-2003

Meissner et al. (2012)	Police interrogation techniques (coded as information gathering or accusatorial or general techniques common to both)	Criminal suspects (or mock suspects in laboratory experiments) receiving accusatorial techniques	Confessions elicited, true confessions elicited	Field study: quasi-experiment (assignment of technique to use) or systematic observation/coding of interview; Laboratory: randomized experiment	Online databases, review of bibliographies, review of abstracts from recent conferences, contacted experts	1996-2011
Mazerolle et al. (2013)	Programs and practices to increase procedural justice and citizen perceptions of legitimacy	Individuals not receiving police program or practice designed to increase legitimacy	Perceived legitimacy, procedural fairness (or perceived procedural fairness), willingness to cooperate with police, trust/confidence in police, social ties, compliance, satisfaction, reduction in reoffending or crime (indirect outcome)	Randomized experiment, quasi-experiment with comparison group or quasi-experimental time series analysis	Online databases, review of bibliographies, review of references of influential authors	1987-2009

Table 2 Participants, number of studies, and results in completed policing reviews

Researchers (Date)	***Participants***	***Number of Studies***	***Number of Experiments***	***Effect Size/Significance CI = Confidence Interval***	***Moderators***
West & O'Neal (2004)	Middle and high school students	11	1	Cohen's d 0.023; CI= -0.04, 0.08	None
Blais & Dupont (2005)	Geographic areas receiving intensive police response	33	0	Average % reduction in injuries with accident = 24.42 (SD = 10.00)	Type of intervention (results fairly consistent across intervention type)
Mazerolle, Soole, & Rombouts, (2007)	Geographic areas receiving police response (hot spots, problem-oriented policing, or community-wide policing) to address drugs	14 studies (15 comparisons in meta-analysis)	3	Odds ratio (large number of meta-analyses, see full report for additional effect sizes) Drug CFS = 1.330 CI = 1.071, 1.642* Drug offenses = 1.530 CI = .749, 3.126 Total calls for service = 1.180 CI = 1.075, 1.296* Total offenses = 1.090 CI = .968, 1.227	Type of intervention (hot spots, POP, community-wide), implementation year, publication type, study design, length of follow-up period, methodological rigor
Weisburd, Telep, Hinkle, & Eck (2008)	Probationers in 2 studies; in all others geographic areas receiving POP response	10 in main analysis; 45 in separate pre/post analysis	4	Cohen's d (SD) Mean = .126 (.047)* Largest = .296 (.142)* Mean for experiments = .147 (.011)* Mean for quasi-experiments = .158 (.098)	None

Davis, Weisburd, & Taylor (2008)	Domestic/family abuse victims	10	5	Cohen's d (SD) Overall mean reports to police = .082 (.088) Mean reports to police in experiments = .117 (.055)* Mean reports on survey = .021 (.072)	None
Goss et al. (2008)	Geographic areas receiving increased police presence to address drunk driving	32	1	No mean effect sizes reported, only individual results from studies	None
Bowers, Johnson, Guerette, Summers, & Poynton (2011)	Geographic area receiving focused policing strategy; catchment areas surrounding target site(s) for assessing displacement	44 eligible studies (16 studies in meta-analysis)	5	Odds ratio Best case treatment effect = 1.39 CI = 1.22-1.59* Best case displacement = 1.14 CI = 1.03-1.14* (significant diffusion) Worst case treatment effect=1.15 CI = 1.05, 1.27* Worst case displacement = 1.04 CI = .95-1.13	Study design, intervention type, size of intervention
Wilson, Weisburd, & McClure (2011)	Cases in which DNA evidence was used	5	1	No mean effect size	None

Braga & Weisburd (2012b)	Generally high rate offenders/gang members living in specified geographic areas	10	0	Cohen's d (SD) Overall mean = DMI = .661 (.213)* Gang/group = .770 (.127)* Individual = .186 (.057)* Near-equivalent quasi-experiments = .196 (.057)* Nonequivalent quasi-experiments = .766 (.112)*	Program type (high-risk individuals, gang/group, Drug Market Initiative [DMI]), Research design (nonequivalent quasi-experiment, near equivalent quasi-experiment)
Braga, Papachristos, & Hureau (2012)	High crime micro geographic units that typically receive extra police attention	19 (25 tests)	10	Cohen's d (SD) Mean = .185 (.035)* POP studies = .232 (.049)* Presence studies = .113 (.034)* Experiments = .116 (.026)* Quasi-experiments = .325 (.012)* Displacement/diffusion = .104 (.016)*- supports diffusion	Type of intervention (increasing presence vs. POP); Methodological quality (experiment vs. quasi-experiment)
Patterson et al. (2012)	Police officers (and sometimes civilians) receiving stress management program; 906 total included	12	9	Hedge's g (SD) Psychological outcomes = .038 (.098) Behavioral outcomes = -.176 (.277)	For psychological outcomes (length of stress management intervention, type of stress management

	across 12 studies			Physiological outcomes = .196 (.196)	intervention, population, gender, years of police experience, random assignment to conditions, attrition)
Koper & Mayo-Wilson (2006, 2012)	Geographic areas where gun crime reduction areas were implemented (e.g. beats, neighborhoods, or citywide)	4 (include 7 tests)	0	No mean effect size	None
Meissner et al. (2012)	Criminal suspects (or mock suspects in laboratory experiments) receiving information-gathering techniques; Total of 608 interrogations coded in field studies; 1,814 participants in laboratory studies	17	12 (laboratory experiments)	<u>Logged odds-ratio transformed into Cox index</u> *Field-studies* (eliciting confessions) Accusatorial = .90, CI =.38, 1.41* Information gathering= .86 CI = .04, 1.69* General= .19 CI = -.69, 1.06 *Laboratory* (eliciting true and false confession) Accusatorial v. Control: True = .46 CI = .06, .86* False = .74 CI = 35, 1.12*	Different experimental paradigms in laboratory studies (“ALT key” paradigm, “cheating” paradigm)

				Information-gathering v. Control: True= .67 CI =.02, 1.32* False= -.23 CI= -.98, .52 Accusatorial v. Information Gathering: True= .64 CI=.01, 1.28* False= -.77 CI= -1.46, -.08*
Mazerolle et al. (2013)	Varied, but all focused on individuals interacting with police in the context of police efforts to enhance legitimacy perceptions	30 (41 comparisons in meta-analysis)	4	<u>Odds ratio:</u> Legitimacy = 1.58 CI = 0.85, 2.95 Procedural justice = 1.47 CI = 1.16, 1.86* Compliance/cooperation = 1.62 CI = 1.13, 2.32* Satisfaction/confidence = 1.75 CI = 1.54, 1.99* <u>Cohen's d:</u> Reoffending= -.07 CI = -.14, .00

* $p < .05$

Table 3 Authors' summary of findings in completed policing reviews

Researchers (Date)	***Authors' Summary of Findings***
West & O'Neal (2004)	"Given the tremendous expenditures in time and money involved with D.A.R.E., it would appear that continued efforts should focus on other techniques and programs that might produce more substantial effects" (p. 1028).
Blais & Dupont (2005)	"…different intervention types bring similar results. No particular intervention seems more effective than the others in improving road safety. In our study the implementation of intensive police programmes was associated with average reductions varying between 23 and 31 per cent of accidents with injuries" (p. 932).
Mazerolle et al. (2007)	"…rather than simply increasing police presence or intervention (e.g. arrests) at drug hotspots, street-level drug law enforcement should (1) focus on forging productive partnerships with third parties, (2) target drug hotspots rather than spreading intervention efforts across neighborhoods, and (3) make efforts to alter the underlying criminogenic conditions that exist in places with street-level drug market problems" (p. 3).
Weisburd et al. (2008)	"Despite a small number of eligible studies, we find an overall positive impact of POP across different units of analysis, different types of problems, and different types of outcome measures" (p. 34).
Davis et al. (2008)	"…while second responder programs may slightly increase victims' confidence in the police to report abuse, they do not reduce the likelihood of repeat violence" (p. 18).
Goss et al. (2008)	"Studies examining increased police patrol programs were generally consistent in reporting beneficial effects on traffic crashes and fatalities, but study quality and reporting were often poor" (p. 2).
Bowers et al. (2011)	"…message from this review is a positive one to those involved in the sort of operational policing initiatives considered, the main point being that displacement is far from inevitable as a result of such endeavor, and, in fact that the opposite, a diffusion of crime control benefits appears to be the more likely consequence" (p. 4).
Wilson et al. (2011)	"The evidence suggests that DNA testing has value when used to investigate a broad range of crime types. There are caveats to this conclusion, and additional high quality evaluations are needed to establish the

	robustness and generalizability of these findings" (p. 5).
Braga & Weisburd (2012b)	"While the evaluation evidence needs to be strengthened and the theoretical underpinnings of the approach needs further refinement, we believe that jurisdictions suffering from gang violence, overt drug markets, and repeat offender problems should add focused deterrence strategies to their existing portfolio of prevention and control interventions" (p. 28).
Braga et al. (2012)	"The results of our updated systematic review and meta-analysis provide strong support for the basic conclusions of the original Campbell review: hot spots policing programs generate modest crime control gains and are likely to produce a diffusion of crime control benefits into areas immediately surrounding targeted high-activity crime places" (p. 19).
Patterson et al. (2012)	"These results do not provide evidence to support the efficacy of stress management interventions for police officers or recruits. Given the weakness of the research designs, we can neither claim that these programs are effective or ineffective" (p. 4).
Koper & Mayo-Wilson (2006, 2012)	"With one exception, the included studies suggest that directed patrols focused on illegal gun carrying reduce gun violence at high-risk places and times. Inferences are limited, however, by the small number of available trials, variability in study design and analytical strategy, and the absence of randomized trials" (p. 33 of Koper & Mayo-Wilson, 2012).
Meissner et al. (2012)	"The available data support the effectiveness of an information-gathering style of interviewing suspects. Caution is warranted, however, due to the small number of independent samples available for the analysis of both field and experimental studies" (p. 7).
Mazerolle et al. (2013)	"Our review finds that police can use a variety of police-led interventions (including conferencing, community policing, problem-oriented policing, reassurance policing, informal police contact, and neighborhood watch) as vehicles for promoting and enhancing citizen satisfaction with and confidence in police, compliance and cooperation, and perceptions of procedural justice" (p. 75-76).

What Do the Reviews Cover?

In a 2006 book Weisburd and Braga identify a number of police innovations that have developed in recent decades (Weisburd & Braga, 2006a). Most of the topics in that book are now covered by completed or in progress systematic reviews. These include community policing (Gill et al., in progress), hot spots policing (Braga et al., 2012), broken windows policing (Braga & Welsh, in progress),[21] problem-oriented policing (Weisburd et al., 2008), and pulling levers policing (also known as focused deterrence strategies; Braga & Weisburd, 2012b). At this point, most of the key areas of policing, particularly related to innovations in policing, have been covered.

Are there other areas where a review might be useful? Third party policing (see Mazerolle and Ransley, 2005) is one area where a review might be useful, as civil remedies and other third-party interventions continue to be used as a useful supplement to police work. Such third party interventions, however, often fall under the rubric of problem-oriented policing (e.g. see Mazerolle et al., 2000). The Weisburd and Braga (2006a) book also devotes chapters to Compstat (Weisburd, Mastrofski, Willis, & Greenspan, 2006) and evidence-based policing (Welsh, 2006). As Weisburd and colleagues (2006) note, Compstat has become an incredibly popular police innovation since its inception in New York City in the 1990s, but there remains only limited

[21] Braga and Welsh recently submitted a protocol for this review but are not far enough along to include this review in the previous section.

evidence on the contribution of Compstat to crime reduction. A systematic review in this area may be useful, but it is not clear that there would be a sufficient body of rigorous evidence to draw upon. It is often the case, as it was in New York City, that overlapping and simultaneous interventions make it difficult to assess the effectiveness of Compstat on its own. Evidence-based policing is an overarching category relevant to all of these reviews. Systematic reviews are designed, in part, to provide clearer answers to practitioners on what strategies do or do not have a strong evidence base. It seems unnecessary to devote a review to evidence-based policing, and it is unclear what such a review would entail.

Moving beyond police innovations, a larger concern may be the more traditional tactics in policing where there are not currently reviews. These more traditional approaches make up what Weisburd and Eck (2004) refer to as the "standard model" of policing. While such strategies are generally seen as outdated and ineffective, they continue to occupy a substantial portion of police time and resources and so more systematic inquiry into their effects may be warranted. For example, random preventive patrol is routinely dismissed as an ineffective strategy that police should not be using (see Telep & Weisburd, 2012) based largely on the results of a single study, the Kansas City preventive patrol experiment (Kelling et al., 1974). As Sherman and Weisburd (1995) note, the small sample of beats in the study created low statistical power, which made it difficult for the evaluation to discern a significant difference between the study groups even if one had existed. We are not suggesting that random preventive patrol is likely to be an effective approach. The data on the clustering of crime in small geographic areas

(e.g. see Sherman, Gartin, & Buerger, 1989; Weisburd et al., 2004) and the strong evidence of effectiveness for hot spots policing (Braga et al., 2012) suggest the greater effectiveness of focused police efforts compared to beat-based random patrol. Nonetheless, a more systematic examination of the impact of increasing patrol in beats or large geographic areas may provide a stronger answer to the question of "does random preventive patrol work?" than simply citing the Kansas City study as the final answer.[22]

Similarly, other parts of the "standard model" of policing may be worthy of systematic review, such as the broad question of the impact of the number of police officers on crime. While others have reviewed prior studies on this issue (e.g. see Marvell & Moody, 1996; Eck & Maguire, 2000), there is not a consensus on the impact more police officers have on crime (see Telep & Weisburd, 2012). While it may be difficult to examine this question with highly rigorous studies (i.e. a researcher would have to be creative to use a randomized design in a study of adding police officers), this is an important question for agencies and local government, particularly in the current era of reduced budgets for public safety.

Problems Encountered

While the systematic reviews described in this chapter have provided a wealth of information for researchers, policymakers, and practitioners, some issues and problems have also arisen. Not all of these are unique to policing reviews; they help to highlight

[22] Weisburd, Telep, Ttofi, and Farrington (in progress) have begun a systematic review to look at the impact of increasing police presence (in both random patrol and hot spots interventions) on crime.

the problems more generally in conducting systematic reviews in crime and justice. A first problem was cited above. In some areas we do not yet have systematic reviews and in others our conclusions are limited somewhat by the available studies.

A second major problem is the difficulties researchers sometimes face in calculating effect sizes for meta-analyses. Sometimes the difficulty is a result of limited studies and in those cases, a meta-analysis may not be appropriate because of the small number of eligible cases. In other cases though, the problem is more of descriptive validity (see Gill, 2011; Perry, Weisburd, & Hewitt, 2010). The authors of included studies often do not provide sufficient data on outcomes to make consistent effect size calculation possible. As a result, review authors are often forced to be rather creative in generating effect sizes that can be compared across studies. Weisburd and colleagues (2008), for example, used six different methods to generate Cohen's d effect sizes for the 10 eligible studies in the POP review.

While there is nothing inherently wrong with using different methods for calculating effects across studies, the more manipulations made to the original data, the greater potential for inconsistencies across reviews and problems with correctly calculating overall effects. For example, the Weisburd et al. (2008) review used an odds ratio method described by Farrington et al. (2007) to calculate effect sizes for four of the studies. Because this calculation is "a non-standard use of the term 'odds ratio'" (Farrington et al., 2007: 35), it is not clear that the standard error estimates for this odds ratio are correct. Of course any errors in individual study effect size standard errors will carry over to mean effect size calculations. A related problem is the reporting of different

effect sizes for the same study across different reviews. The Weisburd et al. (2008) review, for example, reported much smaller effects for the Braga et al. (1999) study than the Braga (2007) hot spots review. The updated Braga et al. (2012) review, however, has adjusted these effect sizes to more closely reflect those in the Weisburd et al. (2008) review. As systematic reviews continue to be updated and refined, it is important that authors report consistent effect sizes for the same study (assuming they are examining the same outcome measures) and explain any discrepancies.

Third, in policing, as in crime and justice more generally, treatments tend not to be entirely consistent across studies and the outcome measures often vary due to data availability or author choices. This tends to be less of a problem in medical trials, for example, where a series of experiments may examine the exact same treatment and the exact same outcome measures. This variation creates additional heterogeneity that can affect mean effect size calculations. This heterogeneity typically makes it important to use random effects models as opposed to fixed effects models, but even with this adjustment, a high degree of heterogeneity across studies could raise concerns about the use of meta-analysis in the first place. For example, in the area of hot spots, nearly all of the hot spots experiments and quasi-experiments did not follow the original Minneapolis model (Sherman & Weisburd, 1995) of simply increasing police presence on street segments. Instead, these later studies tended to use particular strategies in combination with increased presence, such as problem-oriented policing (e.g. Braga et al., 1999). Additionally, some studies focus on calls for service while others examine crime incidents. Since all of the studies in the Braga et al. (2012) review are focused on the

overall approach of concentrating police resources at small geographic areas, a meta-analysis still seems warranted, but the heterogeneity across studies cannot be ignored.

Overall then, we think it important that the effect size calculations in systematic reviews be interpreted with caution. As with any quantitative approach, meta-analysis only provides a best guess at the true effect for each study and for the studies overall based on a number of statistical assumptions. As we noted above, the heterogeneity across studies in many of the reviews and the difficulties in generating effect size estimates should make one hesitant to oversell the findings from any review. It is important for authors to be as comprehensive and transparent as possible in discussions of effect size calculations. Systematic reviews on policing have been an important tool in evaluating what does and does not work in policing, but the limitations, particularly in reviews with a small number of eligible studies, should not be overlooked.

We also think it is important to consider unit of analysis when interpreting effect size magnitude. For Cohen's d, the convention is to view effect sizes of 0.2 as small, 0.5 as medium, and 0.8 as large (see Borenstein, Rothstein, & Cohen, 2001). In terms of crime declines, a small effect is equivalent to about a 20 percent proportional decline in the treatment relative to the control group, a medium effect is associated with about a 38.5 percent proportional decline, and a large effect represents a 48.7 percent proportional decline. These effects however, may represent quite different overall outcomes when considering people versus places. For a person, for example, reducing recidivism risk from 50 percent to 40 percent (a small effect) is noteworthy, but still a fairly small change. However, when thinking about the same effect in a crime hot spot, a

20 percent reduction in crime in the treatment group relative to the control could be quite meaningful. Indeed, even smaller effect sizes may suggest significant crime declines in places. This is particularly important to consider in policing, where many of the interventions in the reviews considered here are place-based rather than person-based.

Finally, multi-faceted interventions create a challenge for determining the effectiveness of particular policing strategies. Policing interventions often combine multiple innovations simultaneously, which makes it difficult to discern what particular aspect of the program is driving the results. A number of the studies in the problem-oriented policing review (Weisburd et al., 2008), for example, also appear in the hot spots policing review (Braga et al., 2012). Is problem-oriented policing driving the effectiveness of the Jersey City POP at violent places study (Braga et al., 1999) or is it the focus on high violent crime hot spots? Or is it that hot spots policing and problem-oriented policing work particularly well in concert? Such multi-faceted interventions are common in policing, and it can be difficult to disentangle these different components using systematic reviews. This, of course, is not a problem limited to systematic reviews. It can be difficult or even impossible to isolate these components in primary evaluation studies as well.

Discussion and Conclusions

In recent years, systematic reviews have been an important means of synthesizing existing rigorous research on important practices and approaches in policing. We have

summarized these reviews and focused on the lessons we have learned from systematic reviews in policing, what might be missing with existing reviews, and problems encountered in current reviews. Overall, systematic reviews have proven to be an essential resource for academics, criminal justice policymakers, and police practitioners interested in knowing with greater confidence whether particular programs, strategies, or tactics are effective. As we complete our review of what we have learned about systematic reviews in policing, we think it useful to discuss collective lessons the police can draw from these reviews and also briefly look to what the future might hold.

What Can Police Learn From These Reviews Overall?

The evidence we have reviewed from systematic reviews on policing suggests certain generalizations the police can draw from these reviews. First, the police are most effective when they focus in on high activity people and places (see also Telep & Weisburd, 2012; Weisburd & Eck, 2004). When police narrow in on specific high-crime places or high-offending individuals, they can more efficiently use their resources to address crime problems. Many of the most effective policing strategies in terms of crime control focus in on small geographic areas (e.g. hot spots policing) or a small group of high rate offenders (e.g. focused deterrence strategies). The police can also draw important lessons from the fact that interventions at micro or meso scales will not simply lead to displacement and push crime to areas nearby. Focusing on a high crime street segment will not just push that hot spot to the next street block. A more likely occurrence than displacement is a diffusion of crime control benefits to nearby areas.

Second, police should focus in particular on proactive problem solving (Lum et al., 2011; Weisburd & Eck, 2004). The police should view themselves not just as a crime response agency that waits for 911 calls before springing into action, but instead as a crime prevention agency that can address underlying conditions that allow crime to develop in certain areas. Proactivity is a key component of most of the successful strategies described above and in particular the benefits of problem solving are clear in the POP review and the drug law enforcement review.

Third, police should, when possible, not rely exclusively on law enforcement and arrest to address crime and disorder (Weisburd & Eck, 2004). While arrest is an important tool of the police, as Goldstein (1990) argues, police can be more effective when they expand the toolbox to include other efforts to address crime such as partnerships with other agencies. This was a clear conclusion of the Mazerolle et al. (2007) review, and Weisburd and colleagues (2008) also note the benefits of multi-agency POP efforts. Focused deterrence projects typically require a multi-agency working group to be successful (e.g. see Braga et al., 2001). These partnerships do not need to just be with other law enforcement agencies either. The work of Mazerolle et al. (2007) and Gill et al. (in progress) suggest that police efforts to collaborate with the community can have significant benefits. As noted above, even if these benefits are not crime-related in the short-term, increases in satisfaction and legitimacy may lead to long-term increases in compliance with the law.

The Future of Systematic Reviews in Policing

As we noted earlier, there are some areas in policing where a new systematic review may be useful. Moving forward, it is important though to balance research generation and research synthesis. Perhaps we have reached a saturation point when it comes to systematic reviews in policing, and there is a need for additional rigorous studies to build the evidence base which these systematic reviews draw upon. Nearly every systematic review reaches the conclusion that more primary research is needed to reach stronger conclusions. Many of these reviews are targeted at interventions where researchers were aware of significant research efforts already undertaken, suggesting that other areas may not have enough research output for a strong review. Of course, without a systematic search one cannot be certain of this.

The good news is that primary research appears to be growing at a rapid rate. In the updated hot spots review (Braga et al., 2012), for example, there were 19 eligible studies, up from nine in Braga's (2007) original review. When the problem-oriented policing review is updated, there will similarly be an increase in eligible studies, as multiple experiments examining POP have been published since the initial review by Weisburd and colleagues (2008). The key for the future of systematic reviews may be to ensure that the pace of primary research keeps up with review completion to ensure that systematic reviews continue to provide useful information for researchers, policymakers, and practitioners.

CHAPTER FOUR: HOW MUCH TIME SHOULD THE POLICE SPEND AT CRIME HOT SPOTS?: ANSWERS FROM A POLICE AGENCY DIRECTED RANDOMIZED FIELD TRIAL IN SACRAMENTO, CALIFORNIA[23]

Introduction

Hot spots policing has been shown to be an effective strategy for reducing crime across a number of rigorous evaluations (see Braga, 2007; Braga & Weisburd, 2010; Braga, Papachristos, & Hureau, in press; Weisburd & Braga, 2006b). The definition of "hot spots" varies across studies, but they are typically small geographic areas (e.g. street blocks or groups of street blocks) that contain very high levels of criminal activity (see Sherman & Weisburd, 1995). The sizable body of experimental research on hot spots policing led the National Research Council (NRC) Committee to Review Research on Police Policy and Practices (2004: 250) to conclude that "studies that focused police resources on crime hot spots provided the strongest collective evidence of police effectiveness that is now available" (see also Weisburd & Eck, 2004).

Despite this strong body of evidence, there remain important gaps in our knowledge about hot spots policing. While research to date has concluded that hot spots

[23] This chapter originally appeared in *Justice Quarterly*, published by Taylor and Francis. Original citation: Telep, C. W., Mitchell, R. J., & Weisburd, D. (In press). How much time should the police spend at crime hot spots?: Answers from a police agency directed randomized field trial in Sacramento, California. *Justice Quarterly*. doi: 10.1080/07418825.2012.710645

policing "works," less research has focused on the question of how police officers should be addressing crime in hot spots. Tactics and approaches have typically varied across evaluations. As Braga (2007: 19) noted in his systematic review of the hot spots literature, "Unfortunately, the results of this review provide criminal justice policy makers and practitioners with little insight on what types of policing strategies are most preferable in controlling crime hot spots." Thus, further study of the effectiveness of particular approaches officers take to addressing crime in hot spots is needed.

We report here on a hot spots experiment in Sacramento, California that begins to address these gaps in the literature by more closely examining how officers can optimize directed patrol dosage at hot spots. The evaluation was one of the first experimental examinations of Koper's (1995) recommendation that police officers randomly rotate between hot spots, spending about 15 minutes patrolling in each. Our results suggest significant overall declines in both calls for service and Uniform Crime Report (UCR) Part I crime incidents in the treatment hot spots relative to the controls as a result of the hot spots intervention. Although not every treatment group hot spot showed declines in calls and incidents, the overall results suggest the benefits of using Koper's (1995) arguments to guide hot spots policing.

Additionally, the intervention and evaluation were conducted without any outside funding and, despite support from a major research center, the experiment was carried out and supervised primarily by practitioners. Nearly all previous hot spots studies have been the result of federal grants, typically from the Department of Justice, that involved close collaboration between researchers and agencies to design and implement hot spots

interventions. In an era of limited economic resources for policing, this experiment suggests a model by which police agencies can oversee the implementation and evaluation of evidence-based interventions using existing resources.

In the sections that follow, we more fully review prior literature on hot spots policing and describe the context in Sacramento that led to the current study. We then describe the experiment, provide results, and discuss how the findings help inform our knowledge of both hot spots policing and efforts for the police to take greater ownership of science in policing (see Weisburd & Neyroud, 2011).

Implementing Hot Spots Policing: A Review of the Literature

As noted earlier, a series of rigorous evaluations suggest that hot spots policing is effective in reducing crime (see Weisburd & Eck, 2004). A Campbell Collaboration systematic review (Braga, 2007; see also Braga et al., in press) came to a similar conclusion as the National Research Council (2004). Although not every hot spots study has shown statistically significant findings, the vast majority of such studies have, suggesting that when police focus on small geographic areas that experience crime and disorder problems, they can have a significant beneficial impact on crime in these areas. Analyses tend to show that 50 percent of calls or incidents are concentrated in less than five percent of places (e.g. addresses or street segments) in a city (see Pierce, Spaar, & Briggs, 1988; Sherman, Gartin, & Buerger, 1989). Research by Weisburd and colleagues (2004) suggests not only that crime is highly concentrated in a small number of places,

but that these concentrations are consistent over time. That is, high crime places do not shift around year to year but are a stable target for police enforcement. Thus, police can target a sizable proportion of citywide crime by focusing in on a small number of places (see Weisburd & Telep, 2010).

In Braga and colleagues' (in press; see also Braga, 2005, 2007) meta-analysis of hot spots studies, they found an overall mean effect size of 0.184, suggesting a meaningful benefit of the hot spots approach in treatment compared to control areas. As Braga (2007: 18) concluded, "extant evaluation research seems to provide fairly robust evidence that hot spots policing is an effective crime prevention strategy." Importantly, there was little or no evidence to suggest that spatial displacement was a major concern in hot spots interventions. That is, crime did not simply shift from hot spots to nearby areas (see also Weisburd et al., 2006). Indeed, a more likely outcome of such interventions was a diffusion of crime control benefits (Clarke & Weisburd, 1994) in which areas surrounding the target hot spots also showed a crime and disorder decrease.

The evidence for hot spots policing is particularly persuasive because it draws from a series of randomized field trials (Braga, 2005), a rarity in policing research. The first of these, the Minneapolis Hot Spots Patrol Experiment (Sherman & Weisburd, 1995), used computerized mapping of crime calls to identify 110 hot spots of roughly street-block length. Police patrol was doubled on average for the experimental sites over a 10-month period. The study found that the experimental as compared with the control hot spots experienced statistically significant reductions in crime calls and observed disorder. The significant decline in calls for service was driven largely by a decline in

soft crime calls (e.g. noise, vandalism, drunks). Hard crime calls (e.g. burglary, assault, auto theft) declined slightly more in the treatment hot spots than the control hot spots, but these differences were not statistically significant. For example, while soft crime calls declined 7.2 to 15.9 percent in the treatment group relative to the control group, depending on the time period examined, hard crime calls declined only 2.6 to 5.9 percent.

While the Minneapolis study was a major advance from random preventive patrol that had previously been (and continues to be) the primary means for distributing police patrol resources (see Kelling et al., 1974; Weisburd & Eck, 2004), officers in Minneapolis were given few specific instructions on how to respond to hot spots. The experiment was a test of patrol dosage, not the activities such dosage entailed. But even the amount of patrol dosage varied considerably during the experimental period. Experimental conditions broke down in the summer, for example, when the ratio of patrol time in the treatment vs. the control hot spots dropped from close to 3 to 1 in May to 1.2 to 1 in August. The department committed itself to providing three hours a day of patrol in each of the 55 treatment hot spots (although this amount of patrol was never achieved), but there was no systematic effort to control the length of time individual officers spent in the hot spots. As Sherman and Weisburd (1995) note, the time officers spent in an individual hot spot varied dramatically from a few minutes to over an hour. Subsequent analyses by Koper (1995), discussed more below, suggest that while increasing police presence generally was beneficial, the time officers spent in hot spots was an important part of the crime prevention equation worthy of further attention.

A series of subsequent randomized experiments also examined the effectiveness of hot spots policing, but they focused more on incorporating problem-oriented policing (POP) into hot spots policing (e.g. see Braga et al., 1999; Braga & Bond, 2008, Weisburd & Green, 1995). These studies concentrated on the police analyzing the specific problems in hot spots to design more tailored responses. These models focused more on what officers were doing in hot spots than how police presence more generally impacted crime and disorder, and so they differ from the focus of the current study. Overall, these studies found significant crime reductions as a result of the POP hot spots interventions.

A recently conducted hot spots experiment in Jacksonville, Florida (Taylor, Koper, & Woods, 2011) was the first to compare multiple hot spot treatments in the same study, with one treatment group receiving a saturation/directed patrol response and the second receiving a problem-oriented response. Results showed a decrease in crime (though not a statistically significant decrease) in the saturation patrol hot spots, but this decrease lasted only during the intervention period and disappeared quickly thereafter. In the POP hot spots, there was no significant crime decline during the intervention period, but in the 90 days after the experiment, street violence declined a statistically significant 33 percent.

These findings are relevant to the current study because the intervention is also a 90-day treatment that focuses primarily on saturation patrol. Much like in Minneapolis, the saturation patrol in Jacksonville was meant to dramatically increase levels of patrol, but the experimental conditions did not specify the exact timing and amount of this patrol. The Jacksonville Sheriff's Office typically spent several hours at a time in the

saturation/directed patrol hot spots during the saturation efforts. The authors conclude that this may not have been the most efficient use of police resources, noting "our results suggest that assigning officers to specific hot spots of violence for hours at a time is not an optimal approach for reducing serious crime. Other research suggests, for example, that a better patrol strategy may be to assign officers to several hot spots and have them make 10–15 minute stops at these locations throughout their shift, preferably on a random basis" (Taylor et al., 2011: 178). We discuss this other research below and its influence on the design of the current study.

The "Koper Curve"

The initial hot spots study in Minneapolis suggested that targeted increased police presence alone leads to some crime and disorder reduction (Sherman & Weisburd, 1995). Officers in Minneapolis were not given specific instructions on what activities to engage in while present in hot spots. Despite the more general approach, the experiment still showed a significant crime control benefit. While the study did not include a systematic examination of officer activities in the hot spots, subsequent analyses by Koper (1995) do provide some insight into how much time officers should be spending in hot spots to maximize residual deterrence (Sherman, 1990)—i.e., the deterrence of crime and disorder when officers are not physically present in the hot spots. Using survival analysis techniques, Koper (1995) found that each additional minute of time officers spent in a hot spot increased survival time by 23 percent. Survival time here refers to the amount of time after officers departed a hot spot before criminal or disorderly activity occurred.

Ten minutes was a critical threshold; at that point the residual deterrence benefits were greater than those generated by an officer simply driving through the hot spot. The ideal deal time spent in the hot spot was 14 to 15 minutes; after about 15 minutes, there were diminishing returns, and increased time did not lead to greater improvements in residual deterrence. This phenomenon is often referred to as the "Koper curve" as graphing the duration response curve shows the benefits of increased officer time spent in the hot spot until a plateau point is reached at around 15 minutes (see Koper, 1995, Figure 1).

As Koper (1995: 668) notes "police can maximize crime and disorder reduction at hot spots by making proactive, medium-length stops at these locations on a random, intermittent basis in a manner similar to Sherman's (1990) crackdown-backoff rotation strategy." Koper (1995) here is citing Sherman's (1990) arguments about the most effective way for police to employ crackdowns. Sherman (1990: 37) advocates for "intermittent, unpredictable, repetitive, and *brief* crackdowns on constantly shifting targets" (emphasis in original). Both Koper (1995) and Sherman (1990) argue for an approach in which police travel between hot spots, spending about 15 minutes in each hot spot to maximize residual deterrence, and moving from hot spot to hot spot in an unpredictable order, so that potential offenders recognize a greater cost of offending in these areas because police enforcement could increase at any moment (see also Loughran et al., 2011; Sherman, 2009). The current study attempted to apply these lessons from Sherman (1990) and Koper (1995) in an experimental context.

Lum (2010) first suggested the use of the "Koper curve" as a translation tool for police agencies. She argued that because officers tend to already be concerned with time,

the Koper Curve provides a straightforward way to explain to departments how to respond to crime concentrations. These principles were applied to an experimental evaluation of license plate reader technology by Lum and colleagues (2011), although this study used a less intensive treatment than Minneapolis and did not find any significant crime control benefits. Ariel and Sherman (2012) also recently applied the Koper Curve to crime in the London Underground in an experimental study with the British Transit Police. They found a significant decline in calls for service in the high crime treatment subway stations compared to the control stations that did not receive extra 15 minute patrols.

Limitations of Prior Studies

As we noted above, a series of rigorous studies suggest that hot spots policing is an effective approach for reducing crime, but we have less knowledge about how exactly police agencies should be addressing hot spots to maximize effectiveness. Taylor and colleagues (2011: 150) note, for example, "the body of research on hot spots policing is still relatively small, and it is not yet sufficient to demonstrate what types of strategies work best for hot spots generally or for particular types of hot spots as defined by types of crime problems or other features." While a number of experiments have focused on the impact of problem solving in hot spots, to date less research on focused on directed patrol at hot spots. This is significant because a Police Executive Research Forum (2008) police agency survey suggested that a large proportion of departments using hot spots policing use directed patrol to respond to crime hot spots (e.g. over 90 percent for

robbery hot spots) and for assault and robbery hot spots, directed patrol was identified by respondents as the most effective hot spots strategy.

This is one of the first experimental studies to apply the lessons of Koper (1995) and the first to use these lessons to assess the impact of a more focused directed patrol strategy applied to all crime on selected city blocks. The current study attempts to explicitly examine the impact of a hot spots strategy designed around Koper (1995) and Sherman's (1990) recommendations. That is, what is the impact of a hot spots approach when officers repeatedly visit hot spots in random sequence, spending around 15 minutes in each place? The goal here is not only to add to the evidence base on hot spots policing, but also to provide a rigorous evaluation of one example police agencies could draw upon when designing hot spots deployment strategies. As Koper (2011) notes, such an approach offers the prospect of allowing agencies to more efficiently use their resources to address the hot spots within jurisdictions.

Study Site and Context

The current experiment was conducted in Sacramento, California by the Sacramento Police Department. Sacramento is the capital of California and according to the U.S. Census had a 2010 population of 466,488. Based on 2010 Census data, the Sacramento Metropolitan area has a population of over 2.1 million and is the 24th largest in the United States and fourth largest in California. Based on 2010 UCR data, the city's violent crime rate (881.48 per 100,000 population) and property crime rate (4,330.23 per

100,000) are above the national average, but only slightly above the average for cities between 250,000 and 499,999 population. Both violent and property crime rates have been on the decline for the past five years. At the end of 2010, the department had 707 sworn officers, although this number has been reduced to 657 due to recent budget cuts.[24]

Hot Spots Policing in Sacramento

The Sacramento Police Department was drawn to hot spots policing as a means of policing more efficiently. SPD faced a third year of budget cuts in 2011 and the first year of layoffs and so interventions that would be both efficient and effective were a top priority for the department. Initial analyses by the crime analysis unit in SPD suggested that Sacramento followed most other major cities in terms of the level of crime concentration. About 4.7 percent of the street segments in the city accounted for 50 percent of the crime calls for service, indicating the appropriateness of a hot spots approach to reducing crime.

In initial conversations between researchers at the Center for Evidence-Based Crime Policy at George Mason University[25] and SPD personnel, the application of the "Koper curve" (1995) principle to an experimental hot spots intervention seemed particularly appealing to the department, both because of its link to policing crime hot spots more efficiently and effectively and for a number of practical reasons. For example, one criticism police officers make of hot spots interventions is that they get

[24] See the 2010 Annual Report staffing numbers (http://www.sacpd.org/pdf/publications/ar/ar10.pdf) versus those in a 2011 *Sacramento Bee* article (http://www.sacbee.com/2011/09/29/3946961/sacramento-region-will-hire-58.html)

[25] Cynthia Lum and Christopher Koper of the Center for Evidence-Based Crime Policy played an instrumental role in these initial discussions and the design of the experiment

bored sitting in a small geographic area for a long period of time. The experiment in Sacramento was designed to minimize boredom (and maximize effectiveness) by using a rotation strategy in which officers would not be spending long periods of time in the same place (see more below). Additionally, the focus on using an approach where officers were assigned to visit a certain number of hot spots in a pre-chosen randomized order gave the department a great deal of control over officer activities. As opposed to the more general approach of increasing presence in hot spots in Minneapolis (Sherman & Weisburd, 1995), this experiment was designed to better ensure treatment was delivered as intended by providing clearer guidelines on how officers should be providing patrol dosage to treatment group hot spots. We discuss the experiment in more detail in the next section.

As noted in the introduction, this experiment was unique because of a lack of outside funding for the implementation and evaluation of the intervention. The SPD took primary ownership of designing and running the experiment and providing data and initial analyses. We discuss the importance of SPD's efforts to take a leadership role in conducting a rigorous evaluation in the concluding section, but we think it noteworthy that a police agency was able to run a randomized field trial using largely existing departmental resources.

Methods

Below we discuss the design and implementation of the hot spots experiment. We begin with a description of the data used for selecting the hot spots for the study and then detail the randomization procedures and the nature of the experimental treatment. Finally, we discuss the outcome measures presented in the results section and our statistical power estimates.

Selection of Hot Spots

In collaboration with the research team from George Mason University, the Sacramento Police Department began the planning process for the hot spots intervention in late 2010. Recognizing that a citywide rollout of hot spots policing may prove overwhelming for the department, a decision was made to initially implement the experiment in two of the department's six districts, Districts 3 and 6. Districts 3 and 6 make up the Central Command area in SPD. District 3 covers the Downtown and Midtown areas of Sacramento as well as the campus of California State University Sacramento. District 6 includes the southeastern part of the city and covers the neighborhoods of Oak Park and Tahoe Park.

To identify hot spots the department began by focusing on all citizen-generated calls for service for Districts 3 and 6 from January 1, 2009 to December 31, 2010. All non-crime calls were removed as were calls that were geocoded to an intersection, in

order to create hot spots that were a street block in length (i.e. both sides of the street intersection to intersection). Calls to certain high-call addresses that do not qualify as typical hot spots of crime (e.g. county courthouse, hospitals) were also removed.[26] A total of 119,480 geocoded calls from Districts 3 and 6 were used. The department looked at the top 40 hot spots based on calls for service.

UCR Part I crime incidents were also geocoded to examine the top 25 hot spots for Part I crimes. The top 20 hot spots for soft crime incidents (e.g. disorder) were also assessed, but did not correlate highly with the call and Part I crime hot spots and so were removed from consideration. For Part I crimes, all 2010 incidents were examined and after removing intersection data and ineligible addresses, a total of 7,479 Part I crime incidents were used.[27] Following the same procedure as was used with the calls for service, street segments were rank ordered and additional hot spots not identified from the top 40 calls for service streets were added.

These initial examinations generated 52 hot spots to be further inspected. Two officers physically observed these areas to confirm that the hot spots were suitable for the experiment (see inclusion criteria below). Based on their observations of the location, the department reduced the total number to 42 hotspots. The criteria for inclusion mirrored those used for the Minneapolis Hot Spots Experiment (Sherman & Weisburd, 1995: 632):

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[26] There were initially 194,306 calls for service. After removing non-crime call categories, 149,204 remained. Removing calls at intersections dropped this number to 123,504. Intersections present a problem for the creation of street-block length hot spots, because the call could be assigned to two or more streets. These calls were eliminated to avoid having to randomly assign calls to a particular street segment (see also Weisburd, Groff, & Yang, 2012). Removing calls that could not be geocoded left 122,563 calls for service. Removing calls to excluded addresses led to the final number of calls for service used.

[27] There were initially 8,657 Part I crimes and after removing intersections, there were 7,525 remaining. The total of 7,479 was reached after removing incidents that could not be geocoded.

1. No hot spot is larger than one standard linear street block.
2. No hot spot extends for more than one half block from either side of an intersection.
3. No hot spot is within one standard linear block of another hot spot.

The first two criteria were used to ensure that an officer could visually inspect the entire hot spot while on patrol. The third was used to ensure that a patrol car in one treatment hot spot would not be visible in another treatment hot spot, thus reducing the likelihood of treatment contamination.

Randomization

The study employed a randomized experimental design with one treatment group that received the hot spots intervention and one control group. Randomized experiments are assumed to have the highest internal validity, and allow for the strongest causal statements about the effects of interventions (see Boruch, Snyder, & DeMoya, 2000; Cook & Campbell, 1979; Farrington, 1983, 2003; Shadish, Cook, & Campbell, 2002; Weisburd, 2003). This is the case because subjects (in this case hot spots) are randomized into treatment and control conditions, and thus their inclusion in one group or another is simply determined by chance.

In order to reduce variability between the treatment and control groups, the hot spots were paired prior to randomization. Two officers paired the hot spots based on similarity in levels of calls for service and crime incidents and similar physical appearance based on the initial observations of all the hot spot blocks. After the pairing,

a computerized random number generator assigned one of the hot spots to an experimental treatment group and the other to a control group (see Figure 2 for the location of the hot spots). In the final 42 hot spots, the mean number of calls for service at the active addresses was 389.27 in the previous year, with a minimum of 70 and a maximum of 1,066. T-tests showed no statistically significant differences between the treatment and comparison hot spots in calls for service or Part I incidents in 2008, 2009, or 2010, suggesting no reason for concern about post-randomization baseline differences between the groups.[28]

[28] The t-tests examining the difference-in-difference between 2009 and 2010 calls for service and Part I incidents in the treatment compared to the control hot spots were also not significant (see more on the difference-in-difference test below). All of these t-tests include only data from the 90-day study period (February 8–May 8) in prior years (e.g. February 8–May 8, 2009). See Table 4 for more on mean calls for service and incidents in the treatment and control hot spots.

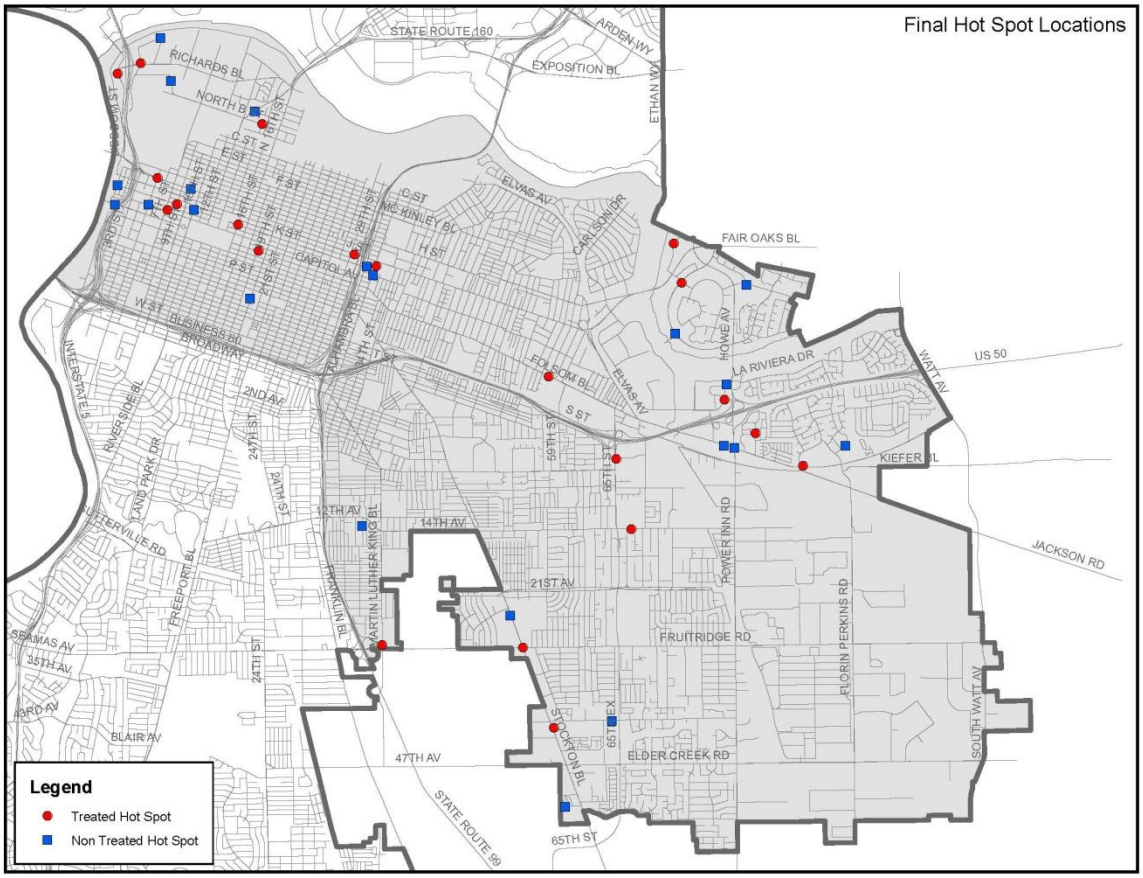

Figure 2 Hot spot locations

Treatment

As noted earlier, this experiment rigorously tests Koper's (1995) conclusions about the most effective and efficient allocation of police patrol at hot spots. Koper's findings suggested stops longer than about 14 to 15 minutes have diminishing returns on deterrence. The goal in the current study is not to evaluate what the officers did while they were in the hot spot; instead, we are evaluating whether officers randomly moving from hot spot to hot spot and spending about 15 minutes in each has a significant impact on crime incidents and calls for service. This is important to note at the outset. We were

unable to evaluate the efficacy of particular officer tactics while in the treatment group hot spots. Instead, we can only draw conclusions about the effectiveness of random approximately 15 minute stops in the hot spot relative to standard police patrol. We revisit this issue in the limitations section.

Each day, officers were assigned one to six hot spots in their patrol area and were given a random order in which to visit their hot spots. The number of hot spots each officer was responsible for varied by assignment as 16 of the treatment group hot spots were in District 3 and only five were in District 6. This random order shifted daily and varied by shift. Randomizations were distributed weekly to patrol officers by their sergeants. Officers were instructed to visit each of their hot spots for 12–16 minutes according to the random order provided and to try to treat each hot spot in their patrol area once every two hours. A special call sign (D1HOT) was used for the experiment and officers were supposed to initiate a call with that sign when present in their assigned hot spots. While officers were not given specific instructions on what to do while visiting hot spots, they did have daily access through their in-car computers to suggestions on proactive activities to engage in. These suggestions included making traffic stops, street checks, and business contacts. Officers were encouraged to get out of their patrol car to initiate citizen contacts while present in the hot spot.

An analysis of calls for service by time of day for the city suggested low call levels for the late night and early morning hours and so to maximize the effectiveness of treatment, the experiment ran seven days a week from 9:00am until 1:00am. The

treatment was implemented as planned for the 90-day period from February 8, 2011 to May 8, 2011.

During this time period, the 21 control hot spots received standard police response and were not the subject of any special police attention. The location of the 21 control hot spots was not publicized to patrol officers in an effort to avoid intentional contamination of the treatment. Police services were not removed from the control areas as this would create ethical concerns; instead the control group can be seen as a "standard police practices" condition.

The crime analysis unit used the department's automated vehicle locator (AVL) system to validate that officers were properly following experimental protocols. Additionally, during the 90-day experimental period, one of the officers overseeing the experiment would attend roll calls for each shift at least twice a week to ensure officers understood the procedures for the experiment. Each week 10 percent of officer-initiated D1HOT calls in the treatment area were randomly chosen and compared to AVL data to determine whether officers were actually present in their hot spots the same amount of time their call logs suggested. The AVL data suggested officers complied with the experimental protocols from the outset of the study.[29] AVL data confirmed officers were always physically present in treatment hot spots while using the D1HOT code.

[29] While the AVL data were not available for analysis in the current paper, the Sacramento Police Department intends to conduct additional research assessing police presence in the hot spots using the AVL data.

Additionally, AVL data confirmed that officers were typically spending about 12 to 16 minutes at a time in hot spots.[30]

The dosage levels stayed at approximately 546 visits a week, with the lowest treatment week being 432 and the highest 698. All of the treatment areas maintained increased levels of patrol throughout the 90-day experiment, although the total number of visits to each hot spot varied somewhat based on how often officers were able to visit the treatment hot spots. District 6 hot spots tended to receive more visits simply because more officer time was available per hot spot, since there were fewer total hot spots in the district. In total, there were 7,095 visits to treatment group hot spots during the experiment for an average of 78.8 visits per day across the 21 treatment group hot spots. The total number of visits at each spot ranged from 223 to 559 with a mean of 337.9. Additionally, data from the records management system suggest that treatment group hot spots received significantly more officer time during the experiment than the control group. In total, there were 2,875 hours of time spent on calls in the treatment hot spots (including the D1HOT call sign) versus 1,014 hours in the control hot spots. This is another indication that the intervention successfully increased levels of patrol in the treatment group. Weekly reports were sent to supervisors, and the area captain used these reports to try to keep treatment levels consistent week to week.

Outcome Measures

[30] Because of their unique patrol situation and responsibilities, bike patrol officers were allowed to follow the randomizations with 80 percent accuracy. They were largely responsible for patrol in the 3M beat of District 3 and often had to cover their partners on stops, and so they were given more flexibility to visit hot spots whenever they were nearby (even if this was out of the randomized order).

We collected three primary outcome measures: calls for service, Part I crime incidents, and soft crimes incidents. Calls for service data include all citizen-initiated calls to 911. Part I crime incidents are based on the UCR classification of serious crimes (e.g. robbery, burglary, auto theft, aggravated assault). Soft crimes refer to less serious criminal incidents that are usually related to disorder (e.g. public drunkenness, trespassing, vandalism).[31] As described in the results section below, the primary outcome of interest was the change between the experimental period and the same time period in 2010 in the treatment versus the control hot spots. We also used the average of the previous three years (2008–2010) from February–May as a second comparison time period and generated an average for calls for service, Part I crime incidents and soft crimes. Outcome measures include the full 24 hours of calls for service and crime incidents, even though the treatment was only implemented 16 hours a day. We did this with the expectation that any residual deterrence of hot spots treatment should operate throughout the day. In Table 4, we present the means and standard deviations for calls for service, Part I incidents, and soft crime incidents in the treatment and control groups for 2008–2010 (the pre-experiment years), as well as 2011 (the experimental year). We discuss the differences between the pre-years and experimental year in the results section below.

[31] Domestic violence-related incidents are included in the soft crime database but were removed in the analyses here because they are unlikely to take place in public and hence were believed to be less likely to be impacted by the experimental treatment.

Table 4 Descriptive statistics for calls for service, Part I incidents, and soft crime incidents in treatment vs. control hot spots

	Means		Standard Deviations	
Variable	***Treatment (n = 21)***	***Control (n = 21)***	***Treatment (n = 21)***	***Control (n = 21)***
2008:				
Calls for Service	50.429	45.905	33.235	28.980
Part I Incidents	6.190	6.667	5.259	9.096
Soft Crime Incidents	2.857	2.238	3.979	2.914
2009				
Calls for Service	48.429	42.286	33.221	30.049
Part I Incidents	6.238	6.286	7.238	10.640
Soft Crime Incidents	2.857	2.190	3.851	3.010
2010				
Calls for Service	46.524	40.619	33.908	22.848
Part I Incidents	6.667	4.524	7.238	5.591
Soft Crime Incidents	2.810	2.524	3.043	2.228
2011:				
Calls for Service	42.952	45.048	31.221	25.535
Part I Incidents	5.000	5.761	5.857	6.549
Soft Crime Incidents	3.952	2.667	3.106	2.497

Note: All totals only refer to the time period February 8–May 8

Analysis of Statistical Power

Statistical power is an important consideration in any research (Weisburd & Britt, 2007), particularly in hot spots experiments where sample sizes are often small. We were limited in the current experiment by the resources the SPD had available to devote to the project. While only 42 hot spots were paired and randomly allocated, this experiment was larger than some previous hot spots evaluations (e.g. Braga et al., 1999; Braga &

Bond, 2008). We examined statistical power estimates prior to the experiment to assess the likelihood of committing a Type II error. Using Optimal Design software (see Spybrook et al., 2011), we determined the study was well powered to detect a large effect (standardized effect size of .80). However for a moderate (.50) or small effect (.20), the study had fairly low power estimates, so we should be cautious in interpreting any non-statistically significant findings. It is also important to note the findings of Weisburd (1993) in his review of statistical power in experimental studies. He found what Sherman (2007) refers to as the "Weisburd paradox." Larger experimental studies typically had lower levels of statistical power, because the increase in sample size tended also to increase the variability in the study and reduced the precision of point estimates. In the current study, increasing the sample of hot spots likely would have diluted treatment and so may not have had a positive impact on statistical power.

Results

We present results below for overall calls for service, Part I crime incidents, and soft crime incidents in the treatment and comparison hot spots. While we present results comparing the experimental to the control hot spots during the 90-day intervention period in 2011, we rely primarily on comparing the change between the 90-day intervention period and the same 90-day period in 2010 in the treatment versus the control group. In other words, we use a difference-in-difference analysis (see Cohen & Ludwig, 2003) to examine whether treatment hot spots showed changes between 2010 and 2011 that were

significantly different from changes experienced in the control hot spots. Because of the randomization of the hot spots, we can reasonably assume that any differences between the two groups are a result of the police treatment.

Calls for Service

While our focus is primarily on the difference-in-difference results, we first present the differences between the treatment and control hot spots during the 90 days of the experiment. During the intervention period, there were 902 calls for service in the 21 treatment hot spots compared to 946 in the 21 control hot spots, a difference of about 4.65 percent. The hot spots in both groups showed a great deal of variability of calls with a range of 9 to 101 calls in the control group (mean = 45.05; standard deviation = 25.54) and 3 to 112 in the treatment group (mean = 42.95; standard deviation = 31.22).[32] The overall differences here are fairly modest and not statistically significant ($t = -.231$; $p = .820$).

When comparing the 2011 calls for service to the same three month period in 2010, the results suggest a stronger treatment effect. On average, each treatment hot spot had a decline of 3.57 calls for service comparing 2011 to 2010, while each control hot spot had an average increase of 4.43 calls. Thus overall, calls for service declined about 7.68 percent in the treatment group and increased about 10.90 percent in the control hot spots. Results are similar when comparing 2011 numbers to call data averaged from

[32] We also examined the hot spots in District 3 and District 6 separately. In both groups, incidents dropped at a fairly similar rate (23.3 percent in District 3 and 29.7 percent in District 6), but calls for service increased slightly in District 6 while showing a decline in District 3. The increase was driven largely by one treatment hot spot which showed a large increase in calls, which we discuss in more detail below. All the analyses will examine the hot spots in District 3 and District 6 together.

2008–2010. On average, treatment hot spots each had a decline of 5.51 calls for service when comparing the 90-day intervention period in 2011 to the prior three year average for the same time period. Each control spot had an average increase of 2.11 calls when comparing 2011 to the prior three year average.

In Table 5, we present one-tailed paired t-tests for the difference-in-difference comparisons. The means represent the average difference when subtracting, for each pair of hot spots, the difference in control hot spot calls for service from the experimental year to baseline conditions (i.e. 2010 or an average of 2008–2010) from the difference in treatment hot spots calls for service from the experimental year to baseline conditions. In other words, if in one pair of hot spots, the control hot spot had 20 calls in 2010 and 25 in 2011 and the treatment group hot spot had 10 calls in 2010 and 5 in 2011, the estimate would be (5-10) – (25-20) or -10. A negative value here indicates a greater decline in calls in the treatment hot spot than the control hot spot. The overall mean represents the average value of this calculation among the 21 pairs of hot spots. We use one-tailed tests for all analyses because, based on prior hot spots studies, we felt confident that a significant backfire effect of hot spots policing was very unlikely.

The results in Table 5 suggest significant declines in calls for service in both comparisons. Calls for service changed significantly more in the treatment hot spots between 2011 and 2010 than they did in the control hot spots. Because calls overall decreased in the treatment group while increasing in the control group, this suggests a beneficial impact of the hot spots treatment. This effect holds comparing the

experimental period to the same period in 2010 or to an average of 2008 to 2010, although the effect is somewhat stronger in the comparison between 2011 and 2010.

Table 5 Paired t-tests for calls for service

Test	*Mean*	*Std. Deviation*	*Std. Error Mean*	*t-Statistic*	*p-Value*
Difference-in-Difference (2011 to 2010)	-8.000	17.632	3.848	-2.079	.026
Difference-in-Difference (2011 to 2008−2010)	-7.619	19.032	4.153	-1.835	.041

df = 20

Part I Crime Incidents

Part I crime incidents showed a somewhat similar pattern to calls for service. During the experimental period, treatment hot spots experienced fewer total Part I incidents (105) than the control hot spots (121). In the same period in 2010, the treatment hot spots had 140 Part I incidents, compared to 95 in the control hot spots. Thus, during the experimental period, the treatment group experienced a 25.00 percent decrease in Part I incidents, while the control group experienced a 27.37 percent increase in Part I incidents. As with calls for service, the hot spots showed some variation in number of Part I incidents, with both the treatment and control hot spots ranging from 0 to 26 Part I incidents during the experimental period.

In Table 6 we present the difference-in-difference t-test results for Part I incidents. Comparing 2011 to 2010, treatment hot spots on average showed a decline of 1.67 Part I incidents, while control group hot spots showed an average increase of 1.24 Part I incidents. The difference-in-difference t-test was statistically significant, indicating the change in crime in the treatment compared to the control hot spots between 2010 and the experimental period was not likely due to chance. The difference between 2011 and 2010 was more substantial than the difference between 2011 and the average of 2008 to 2010. When comparing the experimental period to the three year average, the treatment group shows an average decline of 1.37 Part I incidents, but the control group hot spots also show a slight decline of 0.06 Part I incidents, which explains the non-significant findings in the second row of Table 6. Despite these differences in the two comparisons, the overall trend in both favors the treatment group, and this difference is significant when comparing the experimental period to the same period in the prior year.

Table 6 Paired t-tests for Part I incidents

Test	***Mean***	***Std. Deviation***	***Std. Error Mean***	***t-Statistic***	***p-Value***
Difference-in-Difference (2011 to 2010)	-2.905	5.458	1.191	-2.439	.012
Difference-in-Difference (2011 to 2008−2010)	-1.302	8.441	1.842	-0.707	.244

df = 20

Soft Crime Incidents

Finally, we briefly note the results of soft crime incidents. We did not necessarily expect the hot spots treatment to lead to significant declines in soft crime. Unlike the Minneapolis experiment, which used soft crime calls for service and observations (Sherman & Weisburd, 1995), we relied here on soft crime incident reports. Indeed, because of the increases in officer presence in these high crime areas, we anticipated there could be soft crime incident increases in the treatment hot spots relative to the controls. Results show that soft crime incidents increased in both the treatment and control hot spots, but the increase was greater in the treatment group. On average, each treatment group hot spot showed an increase of 1.14 soft crime incidents between 2010 and 2011 while in control group hot spots, the average increase per hot spot was only 0.14 incidents. As Table 7 shows, the difference- in-difference tests did not show any significant findings when comparing soft crime incidents in the treatment and control groups.

The soft crime results may be more of an indicator of treatment than an outcome of the experiment. That is, the increase in soft crime incidents, as noted earlier, likely reflect to some extent the increase in officer time spent in the treatment hot spots, which provided officers with increased opportunities to write incident reports for disorder crimes. Since our measure of soft crime is entirely police-initiated, it is likely influenced by the experiment itself.

It could also be the case, however, that the hot spots treatment was not successful in reducing soft crime. That is, the non-statistically significant findings for soft crime

might suggest that the hot spots treatment was successful in reducing Part I crime incidents and calls for service, but not soft crime incidents. An examination of the soft crime incidents suggests some persistent problem addresses on the hot spot blocks that are largely driving the soft crime numbers. For example, 12 incidents on one of the hot spot blocks (all of the soft crime incidents on this block) occurred at a single motel the SPD recognized as a trouble spot for drugs and prostitution. Perhaps the 15 minute stops in this experiment were an insufficient treatment dosage to address the underlying problems at hot addresses such as this motel. Problem-oriented policing tactics may be a more successful long term approach to address such places (see Braga & Weisburd, 2010).

Table 7 Paired t-tests for soft crime incidents

Test	***Mean***	***Std. Deviation***	***Std. Error Mean***	***t-Statistic***	***p-Value***
Difference-in-Difference (2011 to 2010)	1.000	5.079	1.108	.902	.189
Difference-in-Difference (2011 to 2008−2010)	.762	4.291	.936	.814	.213

df = 20

Sensitivity Analyses

Finally, while our results suggest overall significant declines in calls for service and Part I crime incidents as a result of the hot spots treatment, we wanted to assess whether these declines were consistent across all of the treatment hot spots through the use of nonparametric tests. Because our overall sample of 42 hot spots is fairly small, Wilcoxon signed-rank tests offer an alternative means to assess the impact of the hot spots treatment that are less sensitive to the normality assumptions of the t-distribution (Siegel & Castellan, 1988; Wilcoxon, 1945). A review of the skewness statistics for the outcome measures above suggests no major concerns about normality in the calls for service data, but some indication of a skewed distribution when examining Part I incidents in the control group.

For calls for service and Part I incidents, we used Wilcoxon signed-rank tests to compare the difference between 2011 and 2010 data in the treatment versus the control hot spots. That is, we first subtracted 2010 calls for service (and incidents) from 2011 calls for service (and incidents) for each hot spot. This left us with a value we refer to as "difference treatment" for the treatment hot spots and "difference control" for the control hot spots. We then compared these numbers for the treatment and control hot spots in a sign test by subtracting "difference treatment" from "difference control" for each hot spot pair. Negative numbers here indicate that calls or incidents declined more in the control hot spot than the treatment hot spot, while positive numbers indicate that calls or incidents decreased more in the treatment hot spot (or increased more in the control spot).

In Figure 3 we present a bar graph for calls for service and Part I incidents that show the number and magnitude of positive and negative values when "difference treatment" was subtracted from "difference control" for each hot spot pair. We show the full results from the Wilcoxon signed rank tests in Table 8.

Table 8 Wilcoxon signed rank tests for calls for service and Part I incidents

Outcome	***Negative Ranks (Mean Rank)***	***Positive Ranks (Mean Rank)***	***Ties***	***Z-Score***	***p-Value***
Calls for Service	10 (7.00)	11 (14.64)	0	-1.582	.057
Part I Incidents	6 (7.83)	14 (11.64)	1	-2.172	.015

For calls for service, Figure 3 suggests that only a slight majority of the 21 treatment hot spots enjoyed greater call declines than their paired control hot spot. This suggests that the overall significant effects in Table 2 may be masking some heterogeneity between individual hot spots. In other words, the hot spots treatment did not reduce calls for service in all of the treatment group hot spots. However, it is worth noting that the magnitudes of the positive and negative differences vary quite markedly. While eight of the 10 differences that favor the control group are less than 10 calls for service, only one of the 11 positive differences fall in this category, with a majority of these differences being greater than 20 calls for service. This is also evident in Table 5 when we examine the mean ranks for positive and negative differences. The mean rank for the positive differences is 14.64 compared to 7.00 for the negative differences. In

other words, in the instances when the treatment group outperformed the control group, it did so with a much greater magnitude on average, than the instances when the control group hot spot outperformed the treatment group. The one-tailed Wilcoxon signed-rank test ($z = -1.582$; $p = .057$) is just above the $p < .05$ threshold and hence we cannot reject the null hypothesis that the median of differences between "difference treatment" and "difference control" is 0 (see Table 5). Overall, the bar graph suggests that the decline in calls for service was not universal across all of the treatment group hot spots.

When examining the results for the Part I crime incidents in Figure 3, they overall favor the treatment group more than for calls for service and the one-tailed Wilcoxon signed-rank test is statistically significant ($z = -2.172$; $p = .015$). Fourteen of the 21 hot spot pairs favor the treatment group and half of these show a difference of greater than five Part I incidents. All of the six comparisons that favor the control group are differences of less than five Part I incidents. Overall, the bar graph suggests that about two-thirds of the individual hot spots showed a treatment impact for Part I crimes, and these impacts were generally as large as or larger than the six pairs where the control hot spot performed better than the treatment hot spot.

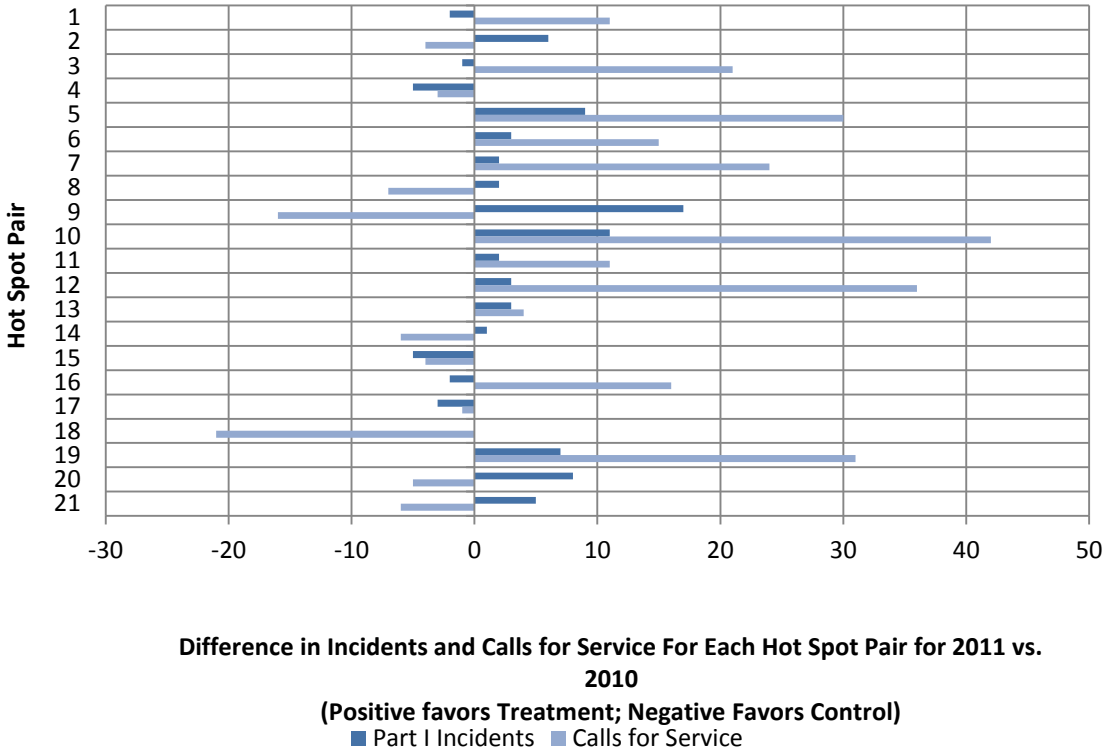

Figure 3 Difference in Part I incidents and calls for service in treatment group vs. control group in 2011 vs. 2010

Our sensitivity analyses overall add some nuance to our earlier findings. Not every treatment group hot spot showed improvements in terms of reduced Part I crime and calls for service. As a result, we do not want to overstate our findings, because these additional analyses indicate that the treatment showed variation in effectiveness across different hot spots. However, we also do not want to ignore the analyses in Tables 2 and 3 that use a statistically more powerful paired t-test and suggest significant declines overall in the treatment group versus the control group in calls for service and Part I crime when comparing 2010 to the experimental period in 2011. As we noted earlier,

low statistical power is a concern in this study and any examination of individual hot spot pairs suffers from even lower power.

Figure 3 also shows that in only four of the 21 pairs did the treatment group hot spot not perform better than the control group hot spot in at least one of the two outcomes. Further in all four of these pairs, the treatment group showed declines in at least one outcome measure, but the control group declines exceed those in the treatment group. In other words, every single treatment hot spot showed either a decline in at least one outcome measure between 2010 and 2011 or an improvement in calls for service or incidents (or both) relative to the control group. Nonetheless, these analyses overall suggest that the hot spots treatment may not have been universally effective across the 21 treatment group hot spots. In particular, we focus on one hot spot with a particularly large increase in calls for service (see the bar for pair 18 in Figure 3). While Part I incidents showed a slight decline from 2010 to 2011, calls increased dramatically from 37 to 61 while increasing only slightly (from 23 to 26) in the control hot spot it was paired with. It is not entirely clear why calls went up so much in this one hot spot, although this street is home to a large apartment complex, and a few units were generating a large number of the 2011 calls. It is possible that these problem tenants were not living in the complex in 2010.

Additional Outcomes

Although the results described above suggest that the hot spots intervention had a significant overall impact on calls for service and Part I crime incidents, we also recognize that practitioners, including those in the SPD, often have additional questions that are not always sufficiently answered by the main experimental results alone. Below, we briefly address some of the most common concerns in SPD to suggest that the hot spots intervention not only reduced overall crime, but also did not have negative side effects that some in the department may have feared.

Response Time

Some in the SPD were concerned that the focus on crime hot spots would take away from officers' ability to respond quickly to 911 calls. While rapid response to 911 calls has not been linked to reducing crime (Spelman & Brown, 1984), quickly responding to emergency calls has remained a key concern of most police agencies (Sparrow, Moore, & Kennedy, 1990; Weisburd & Eck, 2004). We examined response time at the District level to make an initial assessment of whether or not the experiment had a significant impact on response time. In District 3, which included 16 of the 21 hot spot pairs, the median response time across priority levels actually decreased when comparing the experimental period to the same period in 2010. District 6 did experience slight increases in response time across priority categories, but these changes were fairly minimal and District 6 still enjoyed a faster median response time than some of the other districts in the city.

Crime Displacement

As we noted earlier, hot spots interventions do not typically show strong evidence of the geographic displacement of crime to areas nearby. Nonetheless, many officers expressed concern that focusing in on high crime areas would simply push crime to places where police were not increasing their visibility. To examine this, we originally intended to construct two block catchment areas surrounding each treatment and control hot spot to assess whether spatial displacement may have been one explanation for the significant treatment group declines in calls for service and Part I incidents. Because of the geographic proximity of some treatment and control hot spots, however, these buffer areas overlapped at times and thus we could only construct catchment areas for 11 treatment hot spots and nine control hot spots. As a result, we are limited in our displacement analyses and cannot draw strong conclusions about crime displacement in the experiment.

Our results overall show increases in calls for service (from 800 in 2010 to 877 in 2011) and Part I incidents (from 89 in 2010 to 101 in 2011) in the treatment group catchment areas and decreases in calls (from 678 in 2010 to 590 in 2011) and incidents (from 83 in 2010 to 67 in 2011) in the control group catchment areas. At first glance, these findings would suggest some evidence of spatial displacement. However, it is important to note that none of these changes are statistically significant at the $p < .10$ level. That is, there is no evidence of significant crime displacement as a result of the experiment.

When examining the individual hot spots, there are some possible explanations for the increases observed. The treatment catchment area with the greatest raw increase in Part I incidents (up from 4 in 2010 to 14 in 2011) and the largest percentage increase in calls for service (up 52.3 percent from 2010 to 2011) was also the site of a new large retail store that was not yet open in 2010. This change in the environment rather than crime displacement likely explains the crime increase. The catchment areas with the largest raw increase in calls for service (from 81 in 2010 to 142 in 2011) surrounded the hot spot that performed "worst" in the experiment. That is, this was the one hot spot pair where the control group performed better than the treatment group by more than 20 calls for service (see earlier). This rise in calls in that particular treatment hot spot makes displacement an unlikely candidate for explaining the increase in calls for service on the surrounding blocks. When examining the overall results in the catchment areas for the other nine treatment hot spots, Part I incidents increased from 66 in 2010 to 67 in 2011 and calls for service actually declined slightly from 698 in 2010 to 691 in 2011. While we do not see evidence of an overall diffusion of crime control benefits, spatial displacement also does not seem to be driving our overall finding of a crime control benefit from the hot spots treatment.

Officer Proactivity

While hot spots policing can be viewed generally as a proactive strategy designed to prevent crime (see Lum, Koper, & Telep, 2011), some in the SPD were concerned that

the amount of time officers would be spending in crime hot spots would limit total proactivity because officers would be too busy visiting hot spot areas. We analyzed both total officer-initiated activity by district and officer-initiated activity subtracting out all D1HOT calls by District to assess whether levels of proactivity changed as a result of the experiment. As would be expected, total officer-initiated activity increased dramatically during the experimental period in District 3 and District 6. The number of officer-initiated calls increased in District 3 from 2,861 from February 8–May 8, 2010 to 7,543 during the same period in 2011, an increase of 163.65 percent. The increase in District 6 was less dramatic (from 3,048 to 5,270), but still a very sizable 72.90 percent. This can be seen as an indicator of treatment integrity. In the other four districts in the city, two experienced a slight decrease in officer-initiated activity (0.14 percent decline in District 1 and 6.91 percent decline in District 2) and two experienced smaller increases (20.37 percent increase in District 4 and 31.85 percent increase in District 5), which suggest that the sizable increases in Districts 3 and 6 are likely a result of the experimental treatment.

To address the concerns of SPD officers that general proactivity would decline, the D1HOT calls were removed and changes in officer-initiated activity were reexamined. Although the increases are far less dramatic, both Districts 3 and 6 show increases in officer-initiated activity, even when excluding calls directly related to the experimental protocols. The increase was 14.54 percent in District 3 and 5.74 percent in District 6. While Districts 4 and 5 experienced greater increases, there is no indication from these findings that the hot spots experiment prevented officers in Districts 3 and 6 from engaging in other proactive activity. Additionally, these results overall suggest that

officers were not simply sitting in their cars when visiting crime hot spots, but instead were engaging in a great deal of proactivity in treatment areas.

Discussion and Conclusions

Our findings suggest a significant overall impact of the hot spots treatment on total calls for service and Part I crime incidents, particularly when comparing the 90-day experiment to the same time period in 2010. The experiment suggests that the application of Koper's (1995) recommendations to the design of a hot spots intervention can lead to an effective program that successfully addresses both total calls and more serious crime. While our overall results suggest the crime control benefits of the hot spots intervention, our sensitivity analyses also show some variation across the hot spots in the effectiveness of treatment.

While recognizing the inherent difficulties in making comparisons across studies, below we briefly compare the results in this study to similar hot spots interventions that have not applied Koper's (1995) recommendation. We then discuss the implications of the experiment both for the hot spots policing literature and for efforts to increase the occurrence of evidence-based policing. We also note the limitations of the current study and make some final concluding remarks.

While recognizing the limitations of post hoc comparisons across different sites and interventions, we wanted to briefly note how our findings fit in with other similar hot spots interventions, in particular the experiments in Minneapolis (Sherman & Weisburd,

1995) and Jacksonville (Taylor et al., 2011). While the Minneapolis study found a significant impact of the hot spots treatment on total calls for service and observed disorder, there was not a significant impact on hard crime calls for service. Similarly, in Jacksonville, violent crime declined in the saturation/directed patrol hot spots during the intervention period, but the decline was not statistically significant. In contrast, in the current study, Part I (i.e. serious) crime incidents showed significant overall declines, as did total calls for service, although calls here were not divided between hard and soft calls. While there are a number of different possible explanations for why the current intervention may have had a more significant overall impact on serious crime, one plausible reason is the focus here on using Koper's (1995) recommendations on hot spots deployment. Perhaps having officers randomly rotate from hot spot to hot spot every 15 minutes or so had a greater deterrent effect on serious crime. The failure to use this approach was suggested by Taylor and colleagues (2011) as one possible reason for their finding of non-statistically significant effects. While we must be cautious in explaining the reason for the significant overall findings in Sacramento, it is possible that the approach the SPD used makes hot spots policing a more powerful tool in police efforts to address serious crime.

More generally, we think the experiment is an important addition to the more limited literature on directed patrol dosage in high crime hot spots. This is not the first study to provide such recommendations. Braga and Bond (2008), for example, use a mediation analysis to assess the impact of different hot spots approaches, finding that situational efforts and to a lesser extent misdemeanor arrests were effective tactics in

addressing hot spots in Lowell, MA. Still, as Braga (2007) noted, there is a need for additional studies that have clear policy implications for police practitioners. In other words, "hot spots policing works" is less helpful to police practitioners than "sending officers to hot spots for 15 minutes at a time in a random order works." While our findings are only statistically generalizable to Sacramento, we think the approach taken by the SPD can be helpful in guiding hot spots deployment strategies for agencies across the country.

Our findings also suggest the benefits of agency efforts to better manage officers' uncommitted time. Famega, Frank, and Mazerolle (2005), for example, found that over 75 percent of officers' time in Baltimore was unassigned, but little of that time was used for proactive work, in part because supervisors provided little guidance on how officers should allocate their free time. In the current study, officers were given explicit directions on how often to visit particular high crime street segments and suggestions on proactive activities to engage in while present in these hot spots. This experiment thus promoted the use of proactive directed patrol in a way that was lacking in Baltimore. As Famega et al. (2005: 555) note, "It appears that in the absence of directives, officers are *choosing* to remain in their cars, randomly patrolling, waiting for calls for service" (emphasis in original). The Sacramento experience provides a model by which other departments could help better guide the discretionary time of patrol officers in order to address crime more effectively.

We also want to emphasize the importance of the SPD's efforts to take ownership of the implementation and evaluation of the hot spots intervention. Sherman (1998) and

Weisburd and Neyroud (2011) have argued strongly for the importance of police practices being based on scientific evidence, and Weisburd and Neyroud have placed particular emphasis on the importance of police agencies taking a leadership role in science in policing. Weisburd and Neyroud (2011) argue that ownership of science in policing must shift from the universities and research organizations to the police agencies themselves. As they note:

> Such a shift would allow police science to become an integral part of policing and in this way would enable the development of evidence-based approaches for the identification of effective and cost-efficient practices and policies. This is essential if the science of policing is to provide evidence that its practices improve public safety. It is also essential if policing is to gain legitimacy and secure investment in an increasingly skeptical world of public services" (Weisburd & Neyroud, 2011: 6).

Thus, police ownership of science can help push evidence-based policing forward (Sherman, 1998), while also ensuring that police agencies can prove that they are public agencies worth funding in a time when governments are making major cuts to a number of services.

This study is an instance of a police agency taking a leadership role in both developing an innovative approach to addressing high crime areas and evaluating the effectiveness of this approach. This experiment was conducted and evaluated without any outside federal or foundation funding. Additionally, the experiment caused minimal expense for the department. No overtime money was used; instead the intervention was a redeployment of existing patrol resources. George Mason researchers did donate some of their time to consult with the SPD, particularly in the design phase of the study, but the final design and implementation of the experiment was overseen and monitored entirely

by the SPD. The efforts of SPD in this study demonstrate the promise and prospects for a model of improving policing that puts police organizations in the center of increasing the use of science in policing.

Limitations

While we believe this experiment is an important addition to our knowledge about how police can most effectively address high crime areas, we also recognize limitations in the study. First, the 90-day intervention period is short compared to the intervention periods in some previous studies. Although we believe, and our overall results suggest, that a 90-day intervention period is sufficient for the police to have a significant impact on high crime areas, a lengthier intervention period may have been associated with greater crime declines.

Second, in part because of a lack of external funding, we relied entirely on official data for assessing the impact of the intervention and were unable to examine additional outcomes, such as changes in observed physical disorder. We also were unable to use ride-alongs or systematic social observation to assess what officers were actually doing when they patrolled in crime hot spots. As a result, our results do not address the question of what officers should be doing while they are present in hot spots. We can only speak to the overall benefits of using random 15 minute stops. In a related way, we cannot be sure of how officer activities in the hot spots affected our overall findings. It is possible, for example, that particular activities officers engaged in while present in the hot spots are driving the overall call and incident declines, rather than the 15 minute

stops. As we noted previously, officers did have daily access through their in-car computers to suggestions on proactive activities to engage in, and officers were encouraged to get out of their patrol car to initiate citizen contacts while present in the hot spot. We unfortunately do not have the data available to assess officer activities, and so we focus on the fact that the experimental manipulation between the treatment and control hot spots was the use of random 15 minute stops.

Finally, the current study only allows us to assess the impact of using Koper's (1995) recommendations compared to a control group. A more ideal design for future studies would be to have three conditions: a control group that receives standard policing, a treatment group that receives a treatment similar to the current study, and a second treatment group that receives increased police presence similar to the Minneapolis study without direction as to how long officers should spend in hot spots or the order they should visit hot spots in. This would allow for a rigorous test of the extra benefit of using the approach in the current study over a more standard directed patrol strategy. Future research could also test whether 15 minutes is in fact the ideal length of time for officers to spend at crime hot spots. In this case, the three conditions might be a control group, a treatment group that receives the same treatment as the current study, and a treatment group where officers use 10 minute (or 20 minute) stops.

Conclusions

Overall, our findings add to the evidence base on hot spots policing and show that when police make approximately 15 minute visits to crime hot spots in a random order,

they can have a significant overall impact on calls for service and Part I incidents. These findings help reinforce the conclusions of Koper (1995) in an experimental context and in a site very different from Minneapolis in terms of geographic location, racial make-up of the population (Minneapolis = 71.9 percent white and Sacramento = 45.0 percent white) and climate (average February high = 28.4° F in Minneapolis and 64.5° F in Sacramento). These findings suggest that officers need not be in hot spots constantly (see Lawton, Taylor, & Luongo, 2005) or even for long periods of time (see Taylor et al., 2011) to enjoy a crime control benefit. Increased police presence in medium-length, randomly timed increments appears to be an effective way to decrease both total calls for service and serious crime incidents. While we believe the overall findings of our experiment have important implications for police agencies, we also caution that the intervention in Sacramento was not universally effective across each of the 21 treatment hot spots. While we believe the findings of our sensitivity analyses add nuance to our findings, we do not believe we should ignore the overall significant declines in calls for service and Part I incidents.

Although we must be cautious in generalizing beyond Sacramento, our findings have implications for police agencies regarding the adoption of hot spots policing. We also think the overall approach to implementation and evaluation we have presented here is a useful framework for police departments interested in becoming more evidence-based. Other agencies should attempt to replicate and expand upon these findings by taking ownership of the scientific process (Weisburd & Neyroud, 2011). Academics will remain an important partner in assisting with the planning and evaluation of police

interventions, but with limited funding for police departments and for research projects, departments need to think more about ways to use their existing resources in ways that maximize efficiency and effectiveness and make use of rigorous methods to demonstrate to the public and politicians that the police are maximizing the public safety return on taxpayer dollars.

CHAPTER 5: THE RECEPTIVITY OF POLICE TO RESEARCH[33]

Introduction

Todd Clear noted in his 2009 Presidential Address to the American Society of Criminology that it "suddenly seems that everyone in the policy-making world, from professional associations to the White House, has accepted the importance of the evidence-based paradigm" (Clear, 2010: 2). He continued by arguing, "we find ourselves at a time when, across the landscape of the policy world, the idea of 'evidence' for policy making has never had a firmer footing" (Clear, 2010: 4). The push for evidence-based policymaking has become common in academic and policymaking circles across a number of disciplines including crime and justice, and as Clear notes, an increasing consensus is building around the importance of using scientific evidence to guide public policy.

The evidence-based framework has played a major role in policing in the last 15 years, since the publication of Sherman's (1998) seminal article advocating for evidence-based policing. Sherman (1998: 2) began by arguing "Of all the ideas in policing, one stands out as the most powerful force for change: police practices should be based on scientific evidence about what works best." As Weisburd and Neyroud (2011: 2)

[33] This paper will be submitted for publication with Cynthia Lum as a co-author.

describe, much progress has been made on efforts to make the police more focused on effective strategies: "The police, who were once considered conservative and resistant to change, have become a model for criminal justice systems experimentation and innovation." They point to a number of evidence-based innovations, such as hot spots policing and problem-oriented policing that have diffused widely in recent decades (see Weisburd & Lum, 2005; Weisburd & Braga, 2006a, Reaves, 2010). Nonetheless, they also note that evidence-based policing is far from commonplace in most police agencies. They continue, "But having noted the advances in the relationship between research and practice in policing, we think it reasonable to say that despite progress, there is still a fundamental disconnect between science and policing" (Weisburd & Neyroud, 2011: 2). They argue that much still needs to be done to bring research into the forefront of policing and make evidence-based policing more of a reality.

One important step in moving forward with evidence-based policing is to better understand the views of practitioners and frontline officers. Much of the discussion in the evidence-based movement has focused on academics, policymakers, and agency executives or chiefs, but less attention has been giving to the street-level bureaucrats that make evidence-based policy (or any agency policy) a reality (see Lipsky, 1980). Any effort to make scientific evidence a more important part of police policy and practice will require extensive cooperation and investment from officers working in the field. In other words, as Wood, Fleming, and Marks (2008: 75) argue, "If *all* police officers are to be considered as change agents, the challenge before us is to identify and then to establish the conditions that build this capacity, not exclusively from the 'top', but also 'from the

bottom up.'" It is therefore important to assess the extent to which officers understand and apply concepts related to evidence-based policing (see Lum et al., 2012). Do police officers even know what evidence-based policing is? Are they familiar with what the research evidence suggests regarding effective programs for addressing crime and disorder? Are police officers willing to incorporate research findings and evaluation into their day-to-day work?

We report here on an effort to assess police officer receptivity to evidence-based policing and research using a standardized survey instrument. We surveyed officers in two fairly large police agencies, the Sacramento, California Police Department (SPD) and the Richmond, Virginia Police Department (RPD), to better understand the extent to which officers recognize, use, and are open to evidence-based tactics. The focus on two agencies of similar sizes, both serving state capitals on opposite sides of the country, also allows for comparisons both within and across agencies. We first discuss prior literature focused on receptivity to research in policing and other fields, before turning to a description of the officer survey. We then present results for SPD and RPD and conclude by discussing the importance of officer receptivity in efforts to move forward with evidence-based policing.

Receptivity to Research: A Review of the Literature

Prior research on police officer receptivity to research and evidence-based policing is limited. As Lum and colleagues (2012: 70) note, "empirical research on the

sociology of knowledge application and acquisition is scant in policing and in other fields. However, these types of studies may prove just as useful as research that generates evaluations or reviews that synthesize knowledge. Understanding what makes police officers and their supervisors willing to look at and incorporate scientific knowledge and processes into their decision making may better inform both researchers and practitioners about how to apply the results of evaluations." While little research has focused directly on these issues in policing, there exists a longer tradition of research on receptivity across a number of fields, including medicine (e.g., Forsetlund & Bjørndal, 2002; Hansen et al., 1999; Lomas, 1997), nursing (e.g., French, 2005; Hunt, 1981; Wangensteen et al., 2011), social work (e.g., Edmond et al., 2006; Morago, 2010), and education (e.g., Caplan, 1976; Levin et al., 2011). These studies have examined a number of issues related to practitioner use of research findings and factors that increase this use. Our survey focuses more on understanding of and receptivity to scientific evidence and evaluation research and so we focus less here on the extensive literature on research utilization. While this is an important topic for evidence-based policing, our survey did not focus on whether or not officers were using research in their day-to-day work per se, and we were not assessing whether organizations were making use of research findings in their policies and practices. We discuss issues related to research utilization more extensively in chapter 6. We begin by reviewing some major studies on receptivity from a field with some relationship to criminal justice, mental health, before turning more specifically to research in policing and other criminal justice subfields that helped inform the specific questions we asked officers on our survey.

Weiss and Bucuvalas (1980), in some of the most seminal work on research receptivity, interviewed mental health decision makers to assess their views on the usefulness of social science research and the extent to which research was used in practice (see also Weiss & Bucuvalas, 1977). They found overall a general receptivity to research and a belief that research should be used to guide policy and practice, and a majority of respondents reported using research in their own work. Four key characteristics of research influenced whether or not decision makers found it to be useful. The first was research quality, both in terms of how well done the research was and in terms of its comprehensibility. Not surprisingly, interviewees were more receptive to higher quality research. The second was action orientation, or whether or not the research had clear policy implications. Decision makers find it easier to use research when the research clearly informs particular policies or practices. The third was conformity to user expectations. Decision makers were more receptive to research that fit in with their personal beliefs and viewpoints. Finally, and most unexpected, was challenge to the status quo. Respondents were more receptive to research that went against current practice. Weiss and Bucuvalas (1977: 224) found the fact that "challenge is a positive feature of research" to be particularly interesting because it suggests research is "useful not only when it helps to solve problems—when it provides ideas and information that can be instrumentally applied to recognized problems—but research is also useful when it questions existing perspectives and definitions of the problematic… even if the implications are not feasible or politically acceptable at present, such research

helps to develop alternative constructions of reality." Thus, research has the ability to inspire new ideas and stimulate change, even if it does so slowly or indirectly.

Weiss and Bucuvalas (1980) also found that personal and background characteristics had only a small impact on the likelihood of mental health professionals using research in their work. Education level, gender, and age were all fairly poor predictors of the use of research. Those with more years of experience tended to trust their own judgments more and were somewhat less receptive towards research. These respondents were mental health decision makers at the state and federal level, and so most had more education and more day-to-day contact with research than the average police officer. Still, these findings suggest certain characteristics of research may affect the likelihood of research being applied and used in practice, and these research characteristics seem to be more influential than personal characteristics of practitioners.

More recently, Aarons (2004) has also examined the views of mental health professionals, developing the Evidence-Based Practice Attitude Scale as an assessment tool for understand receptivity to research and innovation. His initial scale used questions covering four dimensions of willingness to adopt evidence-based practices: intuitive appeal (i.e., whether the practice makes sense), requirements (i.e., whether the practice is required by a supervisor or law), openness (i.e., whether the provider likes trying new things), and divergence (i.e., whether the practice fits in with usual practices). Organizational characteristics were associated with these different dimensions (e.g. low bureaucracy environments were associated with a greater openness to trying new things), and unlike Weiss and Bucuvalas (1980), Aarons (2004) found that individual

characteristics were also influential. For example, more highly educated providers were more supportive of evidence-based practices with intuitive appeal. Again though, Aarons (2004) was dealing with a better educated respondent pool than most police officers. Further analyses of a larger sample of mental health providers by Aarons et al. (2010) suggest that women are more receptive to evidence-based practices that men, and that more highly educated providers, while more open to practices with intuitive appeal, were less open to practices when they were required. This suggests that the better educated providers may have a general openness to evidence-based practices, but are resistant to being told what to do.

Aarons and colleagues (2012) continued expanding the dimensions to consider in assessing attitudes towards evidence-based practice by recently developing a 50 item questionnaire, a large increase in number of questions from the initial 15-item Evidence-Based Practice Attitude Scale. This new questionnaire includes questions on domains such as balance (i.e., the mix between using art and science in administering mental health therapy) and burden (i.e., the amount of time evidence-based practices take to learn and implement). The findings of Aarons and colleagues (2012) highlight the importance of considering variation in receptivity both within and across organizations and point to the relevance of multiple domains in assessing acceptance of evidence-based practices.

Receptivity research in criminal justice

Within the criminal justice system, limited research on receptivity shows variation within and across subsystems. Rosen (1977), for example, examined the use of social science research in judicial policymaking. He noted the relevance of research in particular Supreme Court decisions, such as the decision to uphold special women's labor laws in *Muller v. Oregon* (1908), which referenced a brief from Louis Brandeis that contained extensive social science and medical data on the impact of extended working hours on women. More recently, justices have referenced psychological and development research in cases such as *Roper v. Simmons* (2005), which made it unconstitutional to execute anyone who committed his crime when under 18. Rosen (1977) though found that scientific research has generally not had a major impact on law or the judiciary. As he argued, "social science must still be accepted and a proper place found for it in the judicial process, and not the other way around. This means social science must be adapted to the requirements of legal procedure if it is to influence law" (Rosen, 1977: 115). Judicial decision making, particularly at the highest levels, is much more influenced by precedent and the social order than social science. Additionally, Rosen notes that lawyers typically do not have extensive social science exposure or training and that the judiciary does little or no independent scientific research.

Nonetheless, even in the judiciary, there is some evidence of increasing receptivity to using research in recent years. The Center for Court Innovation, for example, is involved in a number of demonstration projects based on court research. Many of these projects focus on problem solving courts (e.g., drug courts, mental health

courts), which have proliferated across the U.S. in recent decades (see Casey & Rottman, 2003) and have tended to show evidence of effectiveness (Mitchell et al., 2012). Farole et al. (2008) found in a survey of trial court judges a general willingness to incorporate problem-solving principals into their courtrooms with 75 percent of respondents strongly approving or approving of using problem-solving methods in their current assignment. Despite this, actual use of problem solving practices was generally fairly low, with judges on average reporting using just 2.4 out of 8 practices on a problem-solving checklist often.

In the correctional field, research has focused primarily on the receptivity of treatment providers or top administrators to evidence-based practices and less on the views of frontline guards and staff in jails and prisons. McGovern and colleagues (2004), for example, surveyed drug treatment clinicians and directors on their use of and interest in particular evidence-based practices. They found variation across respondents based on the type of approach with greater receptivity towards some practices (e.g. 12 step programs) than others (e.g. contingency management). They concluded that receptivity takes more than just effective results; clinicians must be convinced that new practices are easy to use, cost-effective, and in line with existing beliefs and attitudes. Using interviews in a state department of corrections Lovell (1988) found variation in the use of research both within and across hierarchical levels of the organization, although research use overall was generally low. Interviewees tended to rely more on staff expertise and laws and standards to guide policy rather than internally or externally produced research. Similarly, Lovell and Kalinsch (1992) find in an unnamed agency concerned with

offender reentry that despite the agency devoting resources to an in-house evaluation unit, the research produced by this unit was largely ignored.

Light and Newman (1992) conducted a national survey of state-level corrections administrators and researchers to assess whether respondents had access to and were aware of social science research. Nearly all respondents believed being aware of social science research was at least somewhat important. Research use, however, was generally low, and respondents were much more likely to make use of non-scholarly research than academic articles. Both research and non-research corrections staff rated practical experience and staff expertise as more useful in day-to-day work. Still, only about a quarter of respondents disagreed or strongly disagreed with the statement that social science research is useful for day-to-day decision making. Light and Newman (1992: 315) conclude by noting the contrasts in the views of respondents: "Members of this sample have not abandoned social science. On the contrary, they appear to regard it quite respectfully and positively, and they view its use as appropriate under certain conditions. It is also apparent, however, that they do not value social science research more highly than information from other sources. Correctional agency officials and staff members express strong support for social science; yet they report using it little in comparison with other types of information and knowledge."

Receptivity in Policing

As noted earlier, very little research has focused specifically on receptivity to research in policing. We describe the five sections of our receptivity survey in more

detail below, but summarize here the existing research on officer receptivity and related topics our survey questions address.

Officer knowledge base

We begin with an important first question in assessing receptivity to evidence-based policing: do officers know what evidence-based policing is? The phrase "evidence-based," as noted above, has become quite common in academic circles, and while there is debate among researchers on exactly how to define evidence-based policing (or evidence-based crime policy),[34] there is a general consensus that evidence-based policing requires the use of high-quality research studies to guide police strategies and policies. To date, no research we are aware of has asked officers whether or not they have heard of evidence-based policing, and if so, to define it. In Aarons' (2004) study of mental health providers, he found very low familiarity with the term "evidence-based practice."

We were also interested in what sources (if any) police officers consult to learn about research and the crime control effectiveness of particular strategies and programs. Nutley, Walter, and Davies (2007) note that it is rare for practitioners (particularly outside of medicine) to read peer-reviewed academic journals, and instead police would be expected to be more likely to read professional journals and magazines, such as *The Police Chief* published by the International Association of Chiefs of Police (IACP). Rojek, Alpert, and Smith (2012), in a national survey of police agencies, found that

[34] See the different definitions offered in the January 2010 Center for Evidence-Based Crime Policy newsletter http://gunston.gmu.edu/cebcp/newsletterjan10.pdf (pp. 6-7).

among agencies that reported using research seldom, sometimes, or very often (93.2 percent of responding agencies), the vast majority (84.7 percent) used professional journals as a way to learn about research findings. Other frequent responses included publications and guides from the IACP (71.3 percent), National Institute of Justice publications (58.7 percent), research conducted by other agencies (58.7 percent), and the Police Executive Research Forum (40.2 percent). Academic journals were less commonly consulted, but over a third of agencies (34.1 percent) did report using them to learn about research.

In one of the few studies of police receptivity to research, Palmer (2011) surveyed inspectors and chief inspectors in the Greater Manchester Police Department in the United Kingdom on the research resources they used and their views towards conducting various kinds of research. These higher-ranking police officers read government publications fairly frequently. Two-thirds of chief inspectors (67 percent) read materials from the Home Office and a majority (54 percent) read publications from the National Policing Improvement Agency (NPIA). Lower ranking supervisors (inspectors) read research less frequently, although almost half of these respondents read publications from the Home Office (44 percent) or the NPIA (48 percent).

We wanted to assess not only to what extent officers are exposed to research but also what they have learned from this research about what works (and what does not) in policing. There has been little research to date that has assessed officer views on the effectiveness of particular strategies to address crime and disorder. At the agency level, we can surmise that the strategies departments report using, such as on the Law

Enforcement Management and Administrative Statistics (LEMAS) survey, are ones they believe are at least somewhat effective in addressing crime. Based on the latest LEMAS data (Reaves, 2010), agencies frequently reported adopting community policing and elements of problem-oriented policing, and larger agencies in particular reported adopting hot spots policing. LEMAS is limited though in that only one individual in each agency completes the survey, and so there is no assessment of individual officer views regarding these and other innovative tactics.

Research on officer views towards particular strategies has tended to focus on officer attitudes and views about community policing (see Chappell, 2009). Studies specifically asking officers whether they believe community policing is or will be effective in reducing crime have shown mixed results. Lurigio and Skogan (1994), for example, found that officers prior to the start of community policing in Chicago generally did not believe the program would be effective in reducing the city's crime rate. Adams, Rohe, and Arcury (2002) found that while males and longer serving officers were skeptical about the crime-control effectiveness of community policing in six agencies in North Carolina, officers specifically assigned to community policing units were much more likely to believe it was effective in addressing crime. Pelfrey (2004) found that community policing officers in Philadelphia believed they were having a greater impact on crime and disorder in their beat and community compared to traditional motorized patrol officers. These results overall suggest there could be variation both within and across departments on officer views regarding the effectiveness of community policing, depending on officer assignment and departmental adoption of community policing.

Additional research has examined the reasons for adopting (or dropping) Drug Abuse Resistance Education (D.A.R.E.) programs (e.g. Birkeland, Murphy-Graham, & Weiss, 2005). Although D.A.R.E. programs are delivered by police officers, the decision to use (or ignore) the largely negative research evidence lies largely with the school district, and so these studies do not deal directly with police officer views and attitudes. Weiss, Murphy-Graham, and Birkeland (2005), for example, found that evaluation research had an impact on school system decisions to abandon or scale back D.A.R.E., largely because the Safe and Drug Free Schools Office in the U.S. Department of Education required districts to choose effective programs in order to receive federal funding.

Officer interactions with crime analysts

While we did not assess how officers' views about the effectiveness of particular strategies affected their behavior, we did want to know to what extent officers took advantage of departmental resources that would allow them to be more evidence-based. Crime analysis is essential to the successful adoption of many evidence-based approaches (Lum, 2009), and so receptivity towards crime analysis and active use of the products of crime analysts are important components of overall receptivity towards evidence-based policing. Little research has examined officers' views towards crime analysis and their use of materials produced by crime analysts in day-to-day work. Cope's (2004) qualitative assessment of the integration of crime analysis into daily policing work suggests a divide can exist between line officers and analysts. This is due in part to a

lack of communication and a general lack of understanding by officers of what analysts do and produce and a lack of understanding by analysts of what officers need to do their jobs more effectively. But more generally, there is a cultural divide between the groups. As Cope (2004: 202) explains, "Police knowledge is contextual and subjective, while crime analysis is conducted out of context to develop overviews of problems. Negotiating these differences is crucial to generate legitimacy and respect for the knowledge produced by crime analysts so they can be viewed as a new generation of crime experts."

Taylor, Kowalyk, and Boba (2007) surveyed 238 crime analysts to examine their views about how well they were integrated into their organizations. They found that overall crime analysts believed they were supported by top administrators, but they expressed lower levels of perceived support from patrol officers. Respondents also noted limited interactions with patrol officers and a belief that patrol officers infrequently used their products. Existing research has not examined whether these crime analyst perceptions mirror the views of officers towards analysts.

Openness to using and conducting research

An additional key question in understanding receptivity is the extent to which officers are open to both using research and conducting their own research either internally or with outside research partners. Rojek, Alpert, and Smith (2012) found in an agency-level survey that only about 7 percent of responding agencies said they never use research to inform policy decisions, with more than half of agencies (53.4 percent)

responding that they sometimes use research and about a quarter (24.3 percent) saying they use research often. Larger agencies were more likely to respond that they use research sometimes or often than smaller ones. This suggests most agencies are at least occasionally using research, although like LEMAS, an agency-level survey does not tell us much about what the views of individual officer within agencies.

Police-researcher partnerships are one way to encourage the use of research in agencies (Nutley et al., 2007). Rojek, Smith, and Alpert (2012) assessed the extent to which police agencies are involved in these partnerships. Among agencies responding to their national survey, 32 percent had participated in a partnership with a researcher within the past five years. Larger agencies were much more likely to participate in such partnerships; 48 percent of agencies with more than 100 officers had recent experience with an academic partner. When non-partner agencies were asked why they had not participated in a research partnership, the most common response (56 percent) was insufficient funding or staff resources. Only 15 percent of agencies said they did not think partnership with a researcher would be of much use to the agency. Agencies also tended to view the partnerships as beneficial with 83 percent of agencies with a partnership rating that partnership as successful or somewhat successful.

One reason that these partnerships are not more common may be, as Buerger (2010) notes, that police and researchers have varying definitions of "evidence" (see also Tseng, 2012). As Buerger (2010: 139) describes "scientists and police approach evidence from dramatically different starting points." While researchers tend to be much more concerned about measurement issues and designing evaluation studies with high internal

validity, police practitioners focus much more on personal experiences. While researchers exclude outliers and focus on averages, police tend to dedicate even greater attention to outliers as these are the most memorable experiences. Thus, research can often be viewed as too abstract and not relevant to the actual experiences of a particular officer. In other words, why base practices on an outsider's statistics and numbers, as opposed to what one has viewed and witnessed while on the job?

Sherman (1984) provides an example of this in describing the reaction of officers following the completion of the Minneapolis domestic violence experiment (Sherman & Berk, 1984), where results suggested that arrest helped deter reoffending by abusers. The officers were reluctant to let the experimental results guide their day-to-day practice because, "'Every case is different. You can't generalize,' went the familiar refrain. This was not so much an antipositivist sentiment as an assertion of the right to retain discretion to vary their actions for reasons other than crime control" (Sherman, 1984: 75). Officers thus expressed skepticism about the generalizability of research findings to specific domestic violence cases. This also suggests that crime control may not always be the only or even primary goal of a street-level officer as he or she responds to calls and incidents. This is a challenge for evidence-based policing, because science can provide answers based on statistical averages (i.e. does arrest generally reduce recidivism in domestic violence cases?), but officers are seeking the "right" answer in a specific case (i.e. will an arrest stop this offender from abusing again?) (see Buerger, 2010; Sherman, forthcoming). We were very interested in understanding how officers respond to this

balancing act between the importance of research and personal experience. This is an issue we revisit below and in chapter 6.

Not all officers in the Minneapolis domestic violence experiment completely bought in to the importance of following protocols in a randomized experiment. At times, there were efforts to override the randomization procedures or unnecessarily disqualify a case from the experiment, because officers were reluctant to let randomization rather than their own experience and intuition guide police treatment (Sherman, 1984, 1992b). We wanted to better understand the extent to which officers were willing to conduct research (including randomized experiments) to evaluate the effectiveness of their strategies and tactics.

Palmer's (2011) research also examined officers' willingness to engage in research. He found, as Buerger (2010) would predict, that officers tend to rely more on experience than research to guide day-to-day decision making. In terms of willingness to conduct research, chief inspectors and inspectors who read research publications (see above) were more likely to be willing to conduct a small randomized trial. Respondents overall tended to be fairly unwilling to stop a tactic if this were required for a randomized trial, but they did show a general willingness to examine crime data before and after an intervention. While a before/after or pre/post design is not as rigorous as a randomized trial (Cook & Campbell, 1979), any sort of evaluation study improves the ability of agencies to assess whether or not a particular strategy or approach is effective. Palmer (2011) also found that officers focused more on their own experiences and the views of the community rather than results from experiments and evaluation studies when

deciding on strategies and tactics, again suggesting the preference for experience over scientific research in day-to-day decision making (see also Lum et al., 2012).

Koehle, Six, and Hanrahan (2010) also suggest that police officers may be more receptive to the results of qualitative research, particularly interviews and focus groups, than quantitative research, which could suggest an overall reluctance to some more rigorous research methods. They note that while police officers may dismiss statistical analyses as too complicated or too far removed from the day-to-day work of policing, "the nature of qualitative findings—in the words of real people, in response to questions familiar in police work—may increase the receptivity of police officers" (Koehle et al., 2010: 20).

Receptivity and higher education

Finally, there exists a long tradition of policing research examining the impact of higher education on officer attitudes and behavior (see Roberg & Bonn, 2004). To date, however, this research has examined neither officer views about the importance of higher education in policing nor how officer education level may impact views towards evidence-based policing. Higher education and evidence-based policing are intuitively linked, because one would expect that better educated officers would have a better understanding of research and effective strategies and thus may be more receptive towards evidence-based approaches. Weisburd and Neyroud (2011), for example, point to the requirement of only a high school education in most police agencies as an impediment to making science a focal point in policing (see Engel & Whalen, 2010).

Empirically though, there has been little assessment of how education affects views towards evidence-based policing, particularly at the officer level. Cave, Grieco, and Telep (in progress) found that police agencies engaged in rigorous research were not more likely to have higher minimum education standards than a comparison sample of large agencies. Additionally, as noted above, in other fields, personal characteristics have had a mixed influence on receptivity.

Critiques

Before turning to a more detailed description of the receptivity survey, we note here that the evidence-based movement in policing is not without critics. While we generally view receptivity to research and evidence-based policing as a good thing, not all scholars agree that evidence-based policing should be something for agencies to strive towards (e.g. see Moore, 2006; Sanderson, 2003, Thacher, 2001). Sparrow (2011) and others at the Harvard Executive Session on Policing and Public Safety have raised a number of concerns about how beneficial evidence-based policing really is for agencies. Sparrow (2011), for example, notes that rigorous research methods (i.e. quasi-experiments and experiments) have produced only a small amount of scientific knowledge in policing, and so focusing largely on these evaluation methods throws out too much valuable knowledge and leaves police with limited guidance on policy and practice. We would argue that while police can learn from a number of different research sources (see Weisburd et al., 2010), the rigorous research evidence in policing has indeed

provided a wealth of information on effective and ineffective approaches (see chapter 2 and chapter 3; Lum et al., 2011).

Sparrow (2011) also points to a potential disconnect between problem-oriented policing and evidence-based policing as a focus on rigorous methodology and proven programs may inhibit the tailored responses required by good problem solving (Goldstein, 1990). Additionally, problem-oriented policing often does not require a major experiment and so a smaller-scale evaluation that can produce more immediate data for police might be most useful. We agree that not all police problems require a large randomized trial, and this is why we assessed officer receptivity to a number of evaluation approaches of varying rigor (see below). We do believe though that some sort of evaluation of the crime control outcomes of policing interventions is important for agencies to ensure resources are being used to maximize effectiveness and efficiency.

The Receptivity Survey

Lum and Telep initially developed the receptivity survey in December 2009 and piloted the survey in a mid-sized department in California in January 2010 (Telep, 2010). The Sacramento Police Department began administering the survey during a required in-service class in March 2011. After examining results from Sacramento, we revised the survey to limit open-ended questions and re-word potentially confusing questions. The Richmond Police Department administered this newly revised version to both sworn officers and civilian employees beginning in April 2012. That version of the survey

appears in Appendix A and is available online at the Matrix Demonstration Project website.[35]

In designing the survey, past literature was a useful guide, but we recognize that the literature on police receptivity to research is scant, and so in some instances, we were charting new territory in our question creation. The work of Aarons (2004) on the Evidence-Based Practice Attitude Scale was particularly useful in designing questions related to officer receptivity to trying new things and officer views about the importance of research vs. personal experience. Sherman (1984) also influenced our thinking about officers' views about relying on research (and in particular, experimental research) in day-to-day practice rather than personal experience. We chose to examine the relationship between higher education and receptivity, in part because of their intuitive link, and in part because of a history of research on policing on efforts to find out if more highly educated officers are "better" in terms of their attitudes and behavior across a number of different areas (see Roberg & Bonn, 2004; Worden, 1990).

The receptivity survey has five sections. The first section assesses officers'[36] knowledge base about evidence-based policing and policing evaluation research. An important first question is whether officers have heard of the term evidence-based policing. If so, they are asked to define it in their own words. Officers are then asked what sources, if any, they consult to learn about the effectiveness of particular tactics. They can choose from a list including both academic journals (e.g. *Criminology*) and

[35] See http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/receptivity-to-research/

[36] We use the term "officers" while recognizing that some of the respondents in the RPD are not sworn law enforcement officers.

practitioner-oriented magazines and publications (e.g. *The Police Chief*). Officers are also asked if they have read any publications or documents produced by their own agency or other organizations and government agencies involved in policing research. The first section then asks officers whether they believe a series of police innovations are effective or ineffective in reducing crime and disorder. This is one of the most important questions in the survey as it provides data on whether or not officers' views line up with research evidence. In other words, do officers actually know what works and what does not? This is crucial for efforts to move evidence-based policing forward. If officers are unfamiliar with the evidence base, or worse, if officers believe effective tactics (according to rigorous research) are ineffective, then it seems less likely they will be willing to adopt these strategies.

The second section examines officers' perceptions and views of science, as well as officers' practices and tactics. It includes questions on how useful officers believe the work of crime analysts is and how often they make use of the materials produced by crime analysts in their daily work. Additionally, officers are asked about the usefulness of having a criminologist working in the agency and whether or not they know if a criminologist currently works in the department. The goal of this section is to get a better understanding of officers' general views towards research and also the work of researchers and analysts within the department. Many police innovations require extensive collaboration between officers and crime analysts (Lum, 2009), and so it is important that officers understand what a valuable resource crime analysts can be for a department.

In the third section, officers are asked questions regarding their view of innovation, new ideas, and outsiders. A series of questions assess whether officers would be willing to try new strategies and collaborate with researchers on new approaches. Additionally, officers were asked whether they agree that when new ideas are presented from commanders, they are typically just a fad. Officers are also asked about a number of different research scenarios to examine their willingness to evaluate whether or not tactics are effective. These range in rigor from simple before/after designs to small randomized trials. These questions ask more specifically about officer receptivity towards doing evaluation research and trying new things. These are important things to understand in efforts to make the police more actively involved in rigorous evaluations of evidence-based practices.

Higher education is the focus of the fourth section. Officers are asked how important they believe higher education is for policing and what they believe should be the minimum educational standard for officers. As noted above, the relationship between higher education and evidence-based policing is not entirely clear. One might assume that officers with a college education will have had more exposure to research methods, and hence will be more open to innovation and evidence-based policing, but to date, only limited research has examined these issues (see Trojanowicz & Nicholson, 1976).

Finally, officers are asked personal and demographic information in the fifth section. These questions include gender, race, ethnicity, years of experience, rank, education, and supervisory experience. These data are useful for assessing whether officer responses vary by any departmental or demographic factors. One might expect,

for example, that a college education would make officers more likely to believe higher education plays an important role in policing.

Methods and Agency Descriptions

The survey took officers about 15 minutes to complete. In Sacramento, the survey was administered to officers on paper during a required in-service training course. Five hundred twenty-three officers out of about 675 total officers completed all or part of the survey. In Richmond, the administration process included surveying both officers and civilian staff. Officers and staff with personal computers were sent emails encouraging them to take the survey online. For those without easy computer access at work (primarily patrol officers), the survey was administered at roll calls by a criminologist working for the Richmond Police Department. The total sample in Richmond is 484 surveys out of a total department size of about 730 sworn officers and 230 civilians.[37]

The Sacramento Police Department serves the capital of California, which according to the U.S. Census had a 2010 population of 466,488. Based on 2010 Census data, the Sacramento Metropolitan area has a population of over 2.1 million and is the 24th largest in the United States and 4th largest in California. The Richmond Police Department similarly serves the capital of Virginia, which had a 2010 population of 204,214 in 2012. The Richmond Metropolitan Area was the third largest in Virginia,

[37] A total of 282 respondents took the survey on paper and 282 employees completed the online survey.

based on the 2010 Census, with a population of 1,258,251. Both agencies have been involved in prior research projects working with academics, although neither agency appears frequently in the Evidence-Based Policing Matrix (Lum et al., 2011), suggesting that neither agency has a long history of rigorous evaluation of crime control evaluations. One study from Richmond on crackdowns (Smith, 2011) is part of the Matrix, and the recent hot spots experiment in Sacramento described in chapter 4 (Telep, Mitchell, & Weisburd, in press) will soon be added to the Matrix. At the time of survey administration, both departments employed multiple crime analysts and in the RPD, a criminology PhD student was working in the office of the chief as a departmental criminologist.

In Table 9 below, we provide a breakdown of the demographic and departmental characteristics of respondents in both Sacramento and Richmond and how these compare to characteristics of the department as a whole, based on data available in each agency's 2011 annual report.[38]

[38] Data for SPD are drawn from: http://www.sacpd.org/pdf/publications/ar/ar11.pdf and data for RPD come from: http://www.richmondgov.com/police/documents/2011AnnualReport.pdf.

Table 9 Survey and departmental descriptive statistics for SPD and RPD

Characteristic	***SPD Survey***	***SPD Annual Report***	***RPD Survey***	***RPD Annual Report***
Total Respondents	523 Sworn (100%) 0 Civilian	676 Sworn (73.8%) 240 Civilian (26.2%)	359 Sworn (74.2%) 58 Civilian (12.0%) 67 Unknown (13.8%)	730 Sworn (76.0%) 231 Civilian (24.0%)
Male	415 (79.3%)	549 (81.2%)	328 (67.8%)	681 (70.9%)
White/Caucasian	304 (58.1%)	509 (75.3%)	250 (51.7%)	537 (55.9%)
Rank = Patrol	446 (85.3%)	550 (60.0%)	253 (52.3%)	592 (61.6%)
Bachelor's Degree	342 (65.4%)	N/A	187 (38.6%)	N/A
Average Years of Experience	14.17 (SD = 8.01)	N/A	11.19 (SD = 7.19)	N/A

Making comparisons from the survey data to annual report data is challenging because the surveys contain missing data, particularly on sensitive questions like officer race, but Table 9 provides some basic comparisons that suggest that the survey sample in both agencies is fairly representative of the department as a whole. The Sacramento sample only includes sworn officers, and so has no coverage of civilian employees. White officers are somewhat underrepresented, although this likely reflects missing race data on the survey. Patrol officers are somewhat overrepresented, which is not surprising because the in-service class where the survey was administered was not required for high-ranking SPD officials. In the RPD, civilian employees are somewhat underrepresented, although again, missing data makes it challenging to assess this. Because of the small number of civilian respondents in the RPD, our results below

combine all respondents (including respondents who did not provide their rank). We describe in our section on variation by respondent characteristics that sworn status was significantly correlated with only two questions. Examining responses from only sworn officers did not greatly affect the results, and so we chose to maximize sample size by using data from all respondents.[39] The percentage of male and white or Caucasian respondents matches departmental numbers fairly well. In RPD, patrol officers are somewhat underrepresented; the survey was advertised to all employees in the RPD and so higher-ranking officials are somewhat better covered in Richmond than in Sacramento. Below, we examine the results for both Sacramento and Richmond, making comparisons between the two agencies when appropriate. These results build on preliminary findings from Sacramento discussed by Lum and colleagues (2012). Because research on officer receptivity is in its infancy, we focus here primarily on basic descriptive analyses, while also examining how officer personal and departmental characteristics impact responses to particular questions. We consider this research exploratory in nature and thus had no specific research hypotheses we were testing. Instead, our goal was to provide an initial descriptive portrait of receptivity to evidence-based policing in these two agencies.

[39] As McCarty and Skogan (2013) note, little recent survey research has assessed views of civilian employees, despite their increasing numbers in recent decades, so it is difficult to know how civilian employee views may differ from sworn officers. In their study, McCarty and Skogan (2013) found little difference between officers and civilians in levels of burnout and factors contributing to employee burnout. Rosenbaum and colleagues (2011) discussed employee surveys developed as part of the National Police Research Platform, noting that surveys on certain topics have been given to both civilians and sworn officers. Data from these surveys, however, are not yet available.

Results[40]

While "evidence-based policing" has become common terminology in the academic world, it seems clear that the term is not as well known in the world of practitioners. Just under a quarter of officers had heard of the term (24.9 percent) in Sacramento. In Richmond, a slightly higher percentage of employees responded they had heard of the term (29.8 percent), but sizable majorities in both agencies were unfamiliar with evidence-based policing.[41]

We then asked respondents what journals or magazines they had read in the past six months and which sources (if any) they consulted to read about the effectiveness of particular strategies or tactics. Results are presented below in Table 10 and Table 11. In both agencies, respondents most typically had read none of the journals or magazines provided. In SPD, over three-fourths of officers (76.9 percent) had not read any of the seven publications that were included. The percentage answering "none of the above" was smaller in RPD, but still a sizable 62.4 percent of respondents. While few officers in SPD read any of the publications provided, about 1 in 6 RPD employees reported reading either *The Police Chief* (16.1 percent) or the *FBI Law Enforcement Bulletin* (15.7 percent). The greater representation of supervisors in the RPD sample may explain the higher rates of practitioner journal readership. The results from Table 11 are somewhat similar. Respondents in both agencies did not frequently read any formal or written

[40] While we focus on results from selected questions here, the full survey results for both agencies are available from the authors.
[41] Respondents who had heard of the term were asked to define it. We will examine these definitions and other responses from open-ended questions in future analyses.

information that was not provided by their own agency. About 46 percent of officers in SPD had read something from their own agency, and about 45 percent had not read any formal or written information in the past six months. Similarly, in RPD officers and civilians are most frequently learning information from their department (46.3 percent) or they are not being exposed to any information (38.4 percent of respondents answered none of the above). Across both agencies, only one other source cracked the 10 percent mark; 10.1 percent of respondents in the RPD read information from the IACP.

Table 10 Officers responses to: "In the last SIX months, from which of the following journals or magazines have you read an article or feature?"

Source	***SPD***		***RPD***	
	n	%	n	%
None of the Above	402	76.9	302	62.4
Other	73	14.0	50	10.3
FBI Law Enforcement Bulletin	32	6.1	76	15.7
The Police Chief	18	3.4	78	16.1
Criminology and Public Policy	5	1.0	4	0.8
Police Quarterly	4	0.8	13	2.7
Criminology	4	0.8	10	2.1
The Criminologist	4	0.8	6	1.2
Justice Quarterly	4	0.8	3	0.6

Note: Officers could choose as many answers as were applicable

Table 11 Officers' responses to: "In the last SIX months have you read any formal or written information provided by the following organizations specifically about the effectiveness of particular tactics or strategies?"

Source	***SPD***		***RPD***	
	n	%	n	%
Your Own Police Agency	241	46.1	224	46.3
None of the Above	236	45.1	186	38.4
Other	38	7.3	25	5.2
COPS Office	22	4.2	38	7.9
IACP	20	3.8	49	10.1
A university	13	2.5	28	5.8
Police Foundation	10	1.9	17	3.5
Police Executive Research Forum	9	1.7	17	3.5
National Institute of Justice	9	1.7	35	7.2
Bureau of Justice Assistance	8	1.5	21	4.3
Bureau of Justice Statistics	5	1.0	23	4.8
Office of Justice Programs	3	0.6	10	2.1
A library database	1	0.2	11	2.3

Note: Officers could choose as many answers as were applicable

We asked officers a series of questions about the crime control effectiveness of 14 policing strategies and innovations. For each, officers were asked to choose whether the tactic was "very effective," "effective," "somewhat effective," or "not effective." They could also choose "I have not heard of this tactic." The findings in both agencies are mixed with officers' views more in line with the research evidence for some tactics than others, suggesting both prospects and challenges in moving forward with evidence-based policing. At a recent presentation, we described "the good," "the bad?" and "the ugly" results that emerged in Sacramento (Telep, 2012). The results were generally more positive in Richmond than in Sacramento, but in both agencies officer viewpoints are very much in line with the research evidence for some tactics, and directly opposite what the research suggests for others. We start with might be termed the good news in both agencies. In Figure 4 and Figure 5, we present officer views on the effectiveness of

problem-oriented policing (POP) and Drug Abuse Resistance Education (D.A.R.E.). In both agencies, these views were generally in line with the research evidence, which suggests the effectiveness of POP in reducing crime and disorder (Weisburd et al., 2010) and the ineffectiveness of D.A.R.E. in reducing adolescent drug use and alcohol use (West & O'Neal, 2004). Nearly 89 percent of officers in the SPD responded that POP is very effective or effective in addressing crime, while more than 28 percent of SPD officers thought D.A.R.E. was ineffective and over half rated it as only somewhat effective. Findings were similar in RPD where 59.1 percent of respondents viewed problem-oriented policing as very effective or effective and just 3.5 percent said the approach was ineffective, although a smaller percentage of respondents viewed POP as very effective compared to SPD. Respondents also generally recognized the largely negative evaluation findings on D.A.R.E. with 63.7 percent saying that D.A.R.E. is somewhat effective or ineffective. Just 2.0 percent of respondents in Sacramento and 6.4 percent in Richmond viewed D.A.R.E. as very effective for reducing crime.

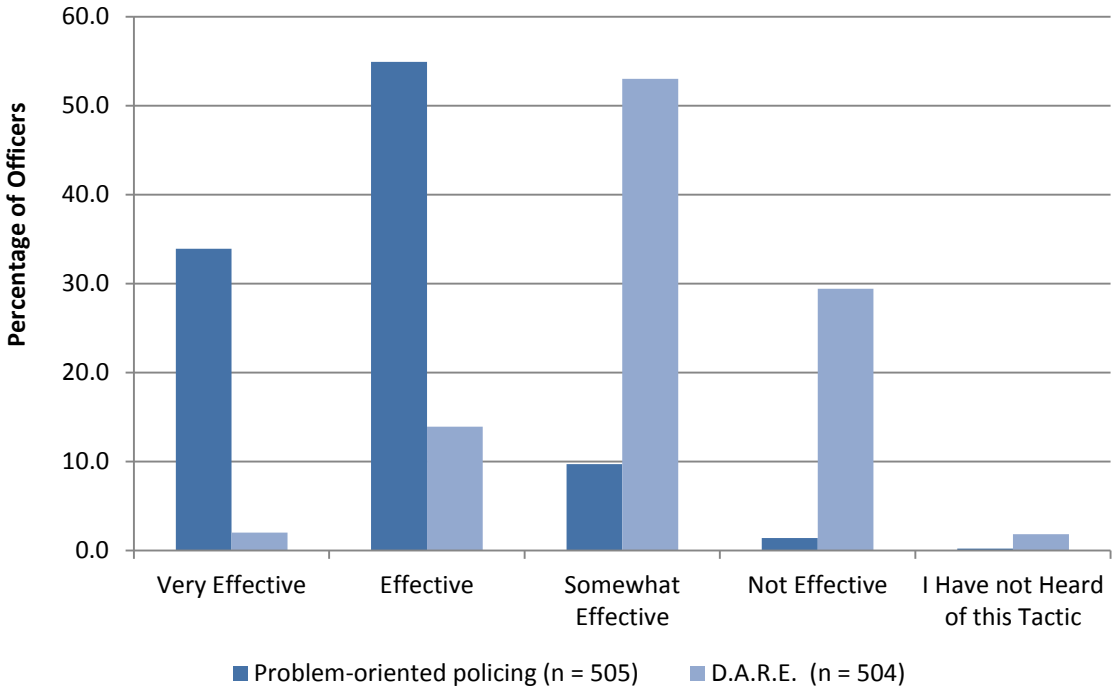

Figure 4 Officer views about the effectiveness of problem-oriented policing and D.A.R.E. in the SPD

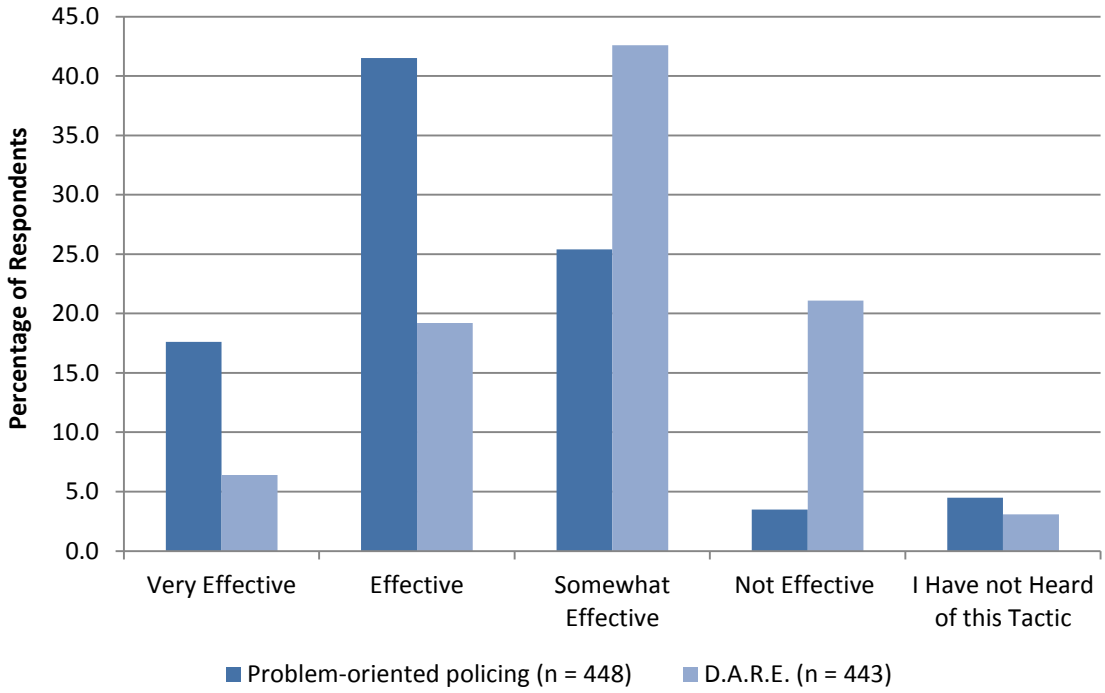

Figure 5 Officer views about the effectiveness of problem-oriented policing and D.A.R.E. in the RPD

In Figure 6, we present respondent views about the effectiveness of community policing for reducing crime. The results here may seem like some bad news, although officer views are somewhat in line with the research evidence. Officers seem fairly convinced of the crime-control effectiveness of community policing in both agencies, although the evidence for community policing reducing crime is not particularly strong. In a recent Campbell Collaboration systematic review, Gill and colleagues (in progress) do find an overall positive impact of community policing on reducing crime when examining effect sizes across studies, although the effect is fairly small in magnitude. Thus, officer views may be overstating the effectiveness of the program. In the SPD, 74 percent of officers called community policing very effective or effective for reducing

crime. In the RPD, fewer respondents, but still a majority (57 percent) viewed community policing as very effective or effective. It could be the case though that officers were thinking more about other potential benefits of community policing, like improvements in citizen satisfaction and perceptions of legitimacy when answering the question. It is also the case that these other outcome measures could be related to crime control in the long term (see Gill et al., in progress, Tyler, 2004). Figure 6 also suggests that the conventional wisdom that officers view community policing negatively may be overstated (at least in these two agencies), as almost all of the officers view it as at least a somewhat effective way of reducing crime (see Lurigio & Skogan, 1994; Paoline, Myers, & Worden, 2000). Less than 10 percent of respondents in both agencies called community policing an ineffective strategy for addressing crime.

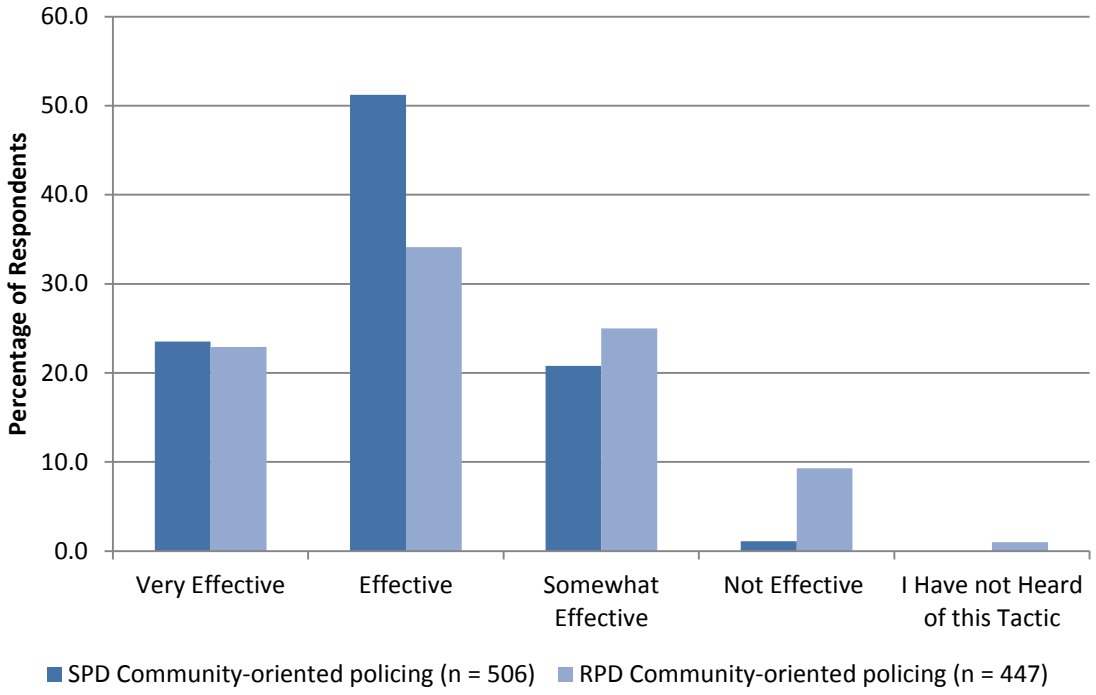

Figure 6 Officer views about the effectiveness of community policing in the SPD and RPD

Figure 7 and Figure 8 present some more problematic results for moving forward with evidence-based policing, particularly in the Sacramento Police Department. These figures display responses about the effectiveness of random preventive patrol and hot spots policing. While random preventive patrol has been a hallmark of policing since the invention of the automobile (Kelling & Moore, 1988), there is little evidence to suggest that officers randomly driving through an assigned beat on patrol is an effective crime deterrent (Sherman, 1997; Weisburd & Eck, 2004). Indeed, the most prominent study on preventive patrol, the Kansas City preventive patrol experiment (Kelling et al., 1974), found no evidence that increasing or decreasing levels of random motorized patrol affected crime levels. In contrast, there is a rigorous and growing body of research

suggesting hot spots policing is an effective way for police to target crime and disorder (e.g., Braga et al., 1999; Braga & Bond, 2008; Sherman & Weisburd, 1995; Weisburd & Green, 1995). In many ways hot spots policing is the exact opposite of random preventive patrol. Instead of randomly allocating patrol resources, hot spots policing takes advantage of the fact that crime is strongly concentrated at a small number of places (see Weisburd, Groff, & Yang, 2012) and thus police resources should also be focused on these places. A recent systematic review and meta-analysis by Braga, Papachristos, and Hureau (2012) confirmed the findings of earlier narrative reviews (see National Research Council, 2004; Sherman & Eck, 2002) that hot spots policing is one of the most effective police strategies for addressing crime. In Sacramento, however, officer views about hot spots policing and random preventive patrol are largely opposite of what the research evidence suggests. Officers in the SPD appear to be rather skeptical of hot spots policing and much more confident in the traditional beat patrol tactic. Just 3.3 percent of officers responded that hot spots policing was very effective and almost 28 percent responded that the tactic is ineffective. Only 7.8 percent of officers responded that random preventive patrol was not effective for reducing crime.

RPD showed different results, particularly for hot spots policing, suggesting more variation across departments than we saw in prior questions. Nearly 60 percent of respondents (59.3 percent) thought hot spots policing was very effective or effective for reducing crime and just 4.5 percent thought hot spots policing was an ineffective tactic. For random preventive patrol, however, the results were fairly similar to Sacramento, suggesting again largely incorrect views about the effectiveness of this traditional

policing approach. Just 7.6 percent of RPD respondents thought random preventive patrol was not effective with 38.6 percent of respondents viewing the tactic as very effective or effective.

Respondents in both departments also tended to view rapid response to 911 calls for service as an effective way to address crime. This evidence, however, suggests that rapid response only contributes to an on-scene arrest in a very small portion of cases (Spelman & Brown, 1984), and thus rapid response is viewed, along with random preventive patrol, as an ineffective "standard model" policing tactic (Telep & Weisburd, 2012; Weisburd & Eck, 2004). Despite this research evidence, in the SPD 62.3 percent of officers viewed rapid response as a very effective or effective tactic, and in RPD, 54.1 percent of respondents answered very effective or effective.

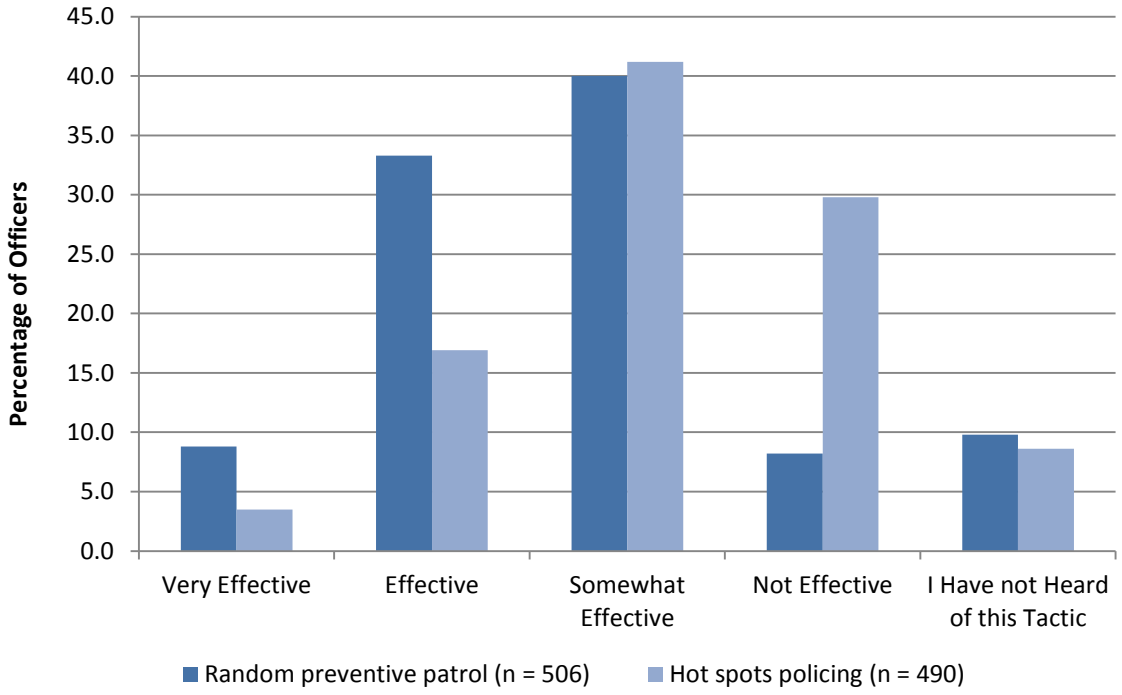

Figure 7 Officer views about the effectiveness of hot spots policing and random preventive patrol in the SPD

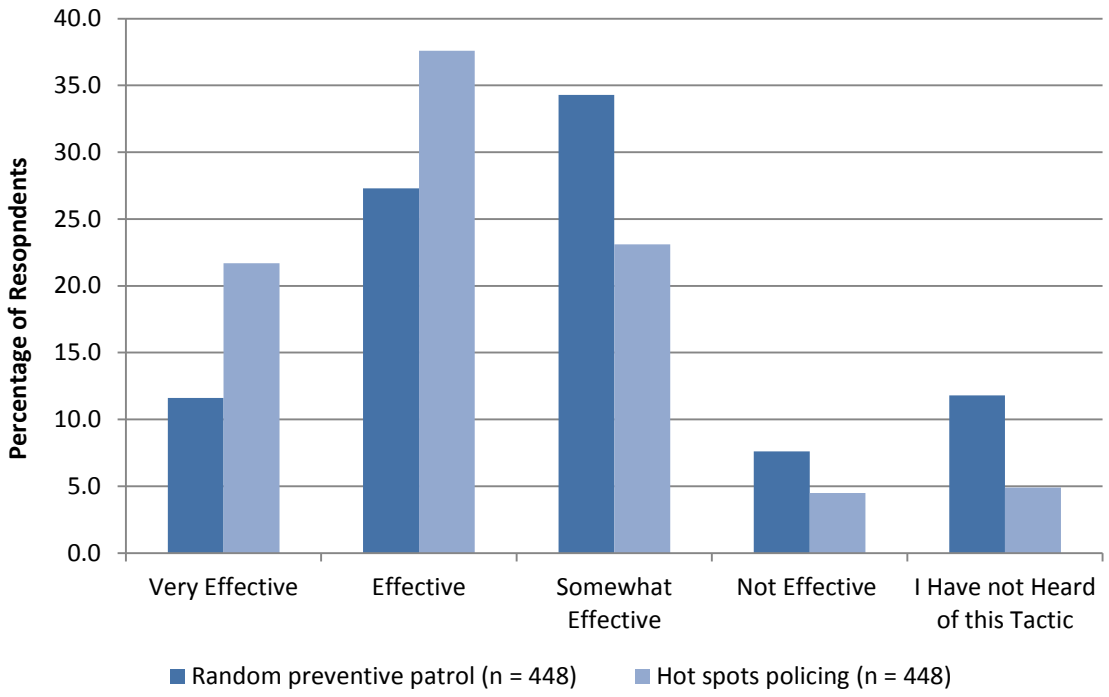

Figure 8 Officer views about the effectiveness of hot spots policing and random preventive patrol in the RPD

There were also some policing innovations that, while popular in academic circles, seem to be lesser known among police practitioners. For example, 49.6 percent of respondents in the RPD said they had not heard of "pulling levers" interventions to reduce gang violence and 47.3 percent answered they had not heard of restorative justice. Similarly, in the SPD, 52.9 percent of officers had not heard of "pulling levers" interventions and 61.6 percent of respondents answered they had not heard of restorative justice. Both "pulling levers" approaches and restorative justice programs have shown evidence of effectiveness in reducing crime and/or decreasing recidivism (see Braga, 2008; Braga & Weisburd, 2012a; Sherman et al., 2005).

The second section of the survey focused on officer views on the usefulness of crime analysis, criminologists working within the agency, and police research more generally. In Figure 9, we present results on how often officers reported using materials produced by crime analysis in their daily work. The figure suggests a greater use of these materials by officers in the RPD, where 28.1 percent of respondents said they used such materials often versus just 7.1 percent in the SPD. In the SPD, the majority of officers (61.2 percent) reported using such materials rarely or not at all. These differences highlight the variability that can exist across agencies in the acceptance of crime analysis and use of materials from crime analysts (see O'Shea & Nichols, 2003). As Taylor and Boba (2011: 6) have noted, getting officers to use the materials crime analysts are producing is a major challenge for a number of reasons including, "a police culture that is perceived to question the legitimacy of analytical work, a hierarchy that may take little notice of non-police staff, organizational fragmentation, a reactionary stance on policing, and a failure to support innovation" (see also Santos, 2013). Our results suggest these barriers to use may exist in both agencies, although they seem to be much more pronounced in the SPD.

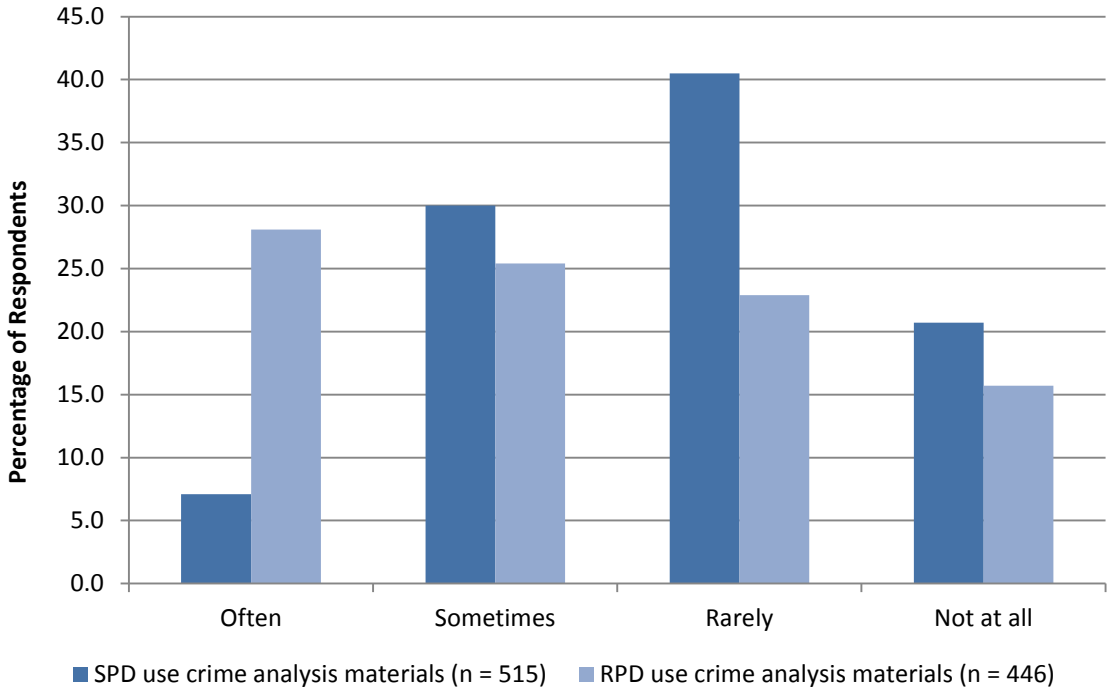

Figure 9 Officer responses to "How often do you use materials from crime analysis in your daily work" in the SPD and RPD

We asked officers if a criminologist (which we defined as an academically-trained researcher who is not a sworn officer) was currently working in their agency, and then regardless of whether or not a criminologist was currently part of the agency, to what extent they thought a criminologist would be helpful to the agency. At the time of survey administration, the RPD did have a criminology graduate student working on research and accreditation issues. The SPD did not have a criminologist working in the agency. RPD officers were more likely to answer that the agency did have a criminologist on staff (21.3 percent) compared to SPD (5.8 percent), although this still suggests a sizable proportion of officers did not know about the criminologist on staff. In both agencies officers were fairly unsure about whether there was a criminologist in the agency with

45.9 percent of respondents in the RPD and 68.6 percent in the SPD answering "not sure" to this question.

Respondents in both agencies were most likely to say that a criminologist would be somewhat helpful, regardless of whether or not the agency currently employed one (see Figure 10). Just over 40 percent of respondents in the SPD (40.7 percent) and 36.8 percent of RPD respondents said a criminologist would be somewhat helpful in the agency. The least common response in both agencies was "not at all helpful" with 10.5 percent of respondents answering this way in the SPD and 13.2 percent in the RPD.

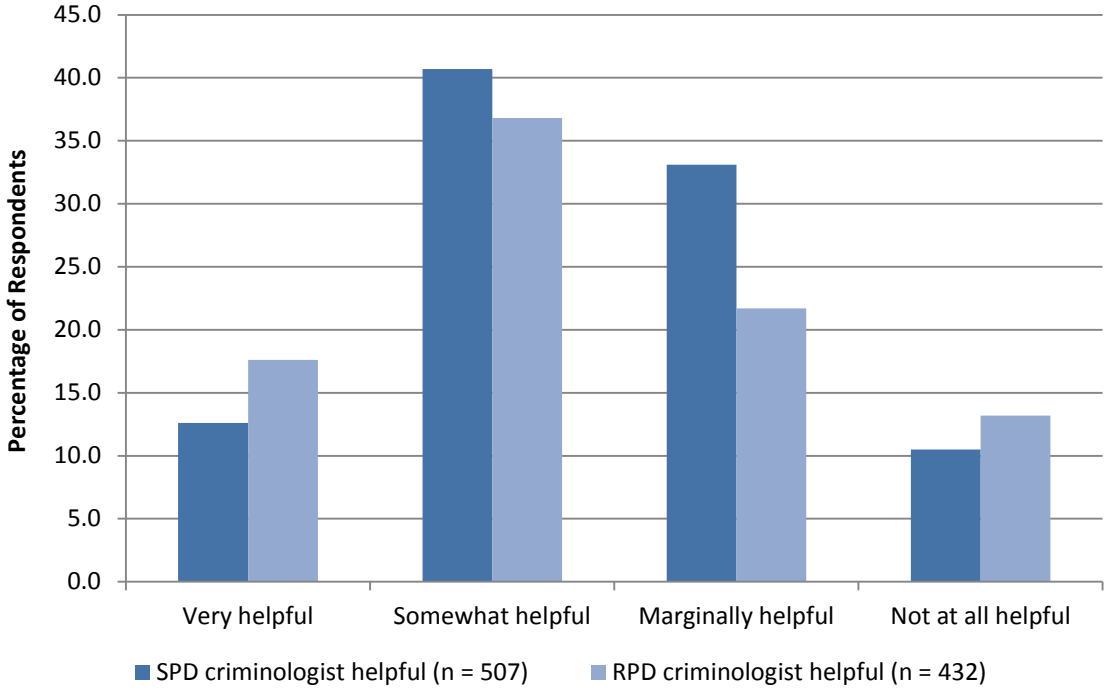

Figure 10 Officer responses to "regardless of whether your agency currently employs a criminologist, how helpful do you think a criminologist would be in your agency?" in the SPD and RPD

We asked officers about the usefulness of information from research regarding police tactics (see Figure 11). Some differences emerged between agencies here with officers in the SPD generally finding research to be more helpful than respondents from the RPD. In the SPD, the percentage of officers saying information from research was very helpful (21 percent) was more than three times higher than in RPD, where just 6.8 percent of respondents find research to be very helpful. Similarly, RPD respondents were much more likely to say research was not at all helpful (16.9 percent) versus officers in the SPD (3.3 percent). These findings are particularly interesting of light of the fact that RPD officers are somewhat more likely than SPD officers to be exposed to research evidence from academic and professional sources. For academics, the results suggest that in both agencies, there is much room for improvement in making social science research more useful to practitioners.

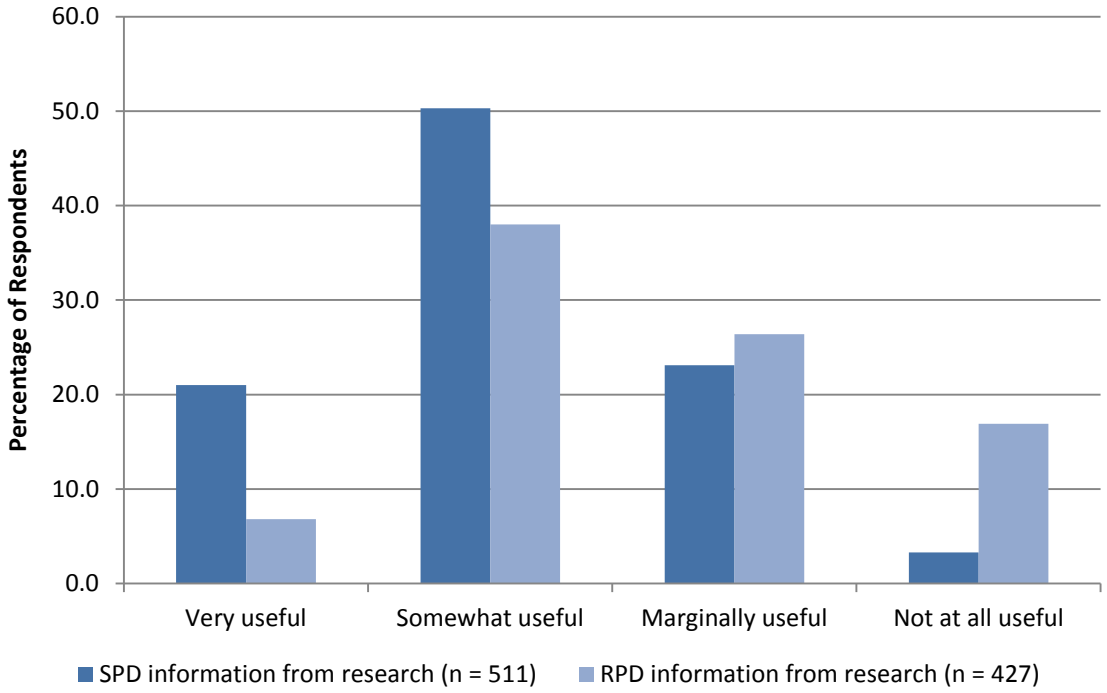

Figure 11 Officer views about the usefulness of information from research regarding police tactics in the SPD and RPD

In the third section of the survey, we assessed officers' views regarding the importance of conducting research and using scientific evidence to guide daily practice. In Figure 12 are officer responses to the question of what should be the balance between scientific research and personal experience in day-to-day decision making. Officers in both agencies overwhelmingly believed personal experience should play a greater role than research in day-to-day work. In the SPD, 24.5 percent of officers said experience should control 90 percent of decision making with scientific research making up the remaining 10 percent and 55.6 percent of respondents said experience should contribute 75 percent and science should make up the balance. Results were fairly similar in the RPD, where 21.1 percent of respondents believed experience should make up 90 percent

of decision making and 44.4 percent answered that experience should contribute 75 percent to day-to-day decision making.

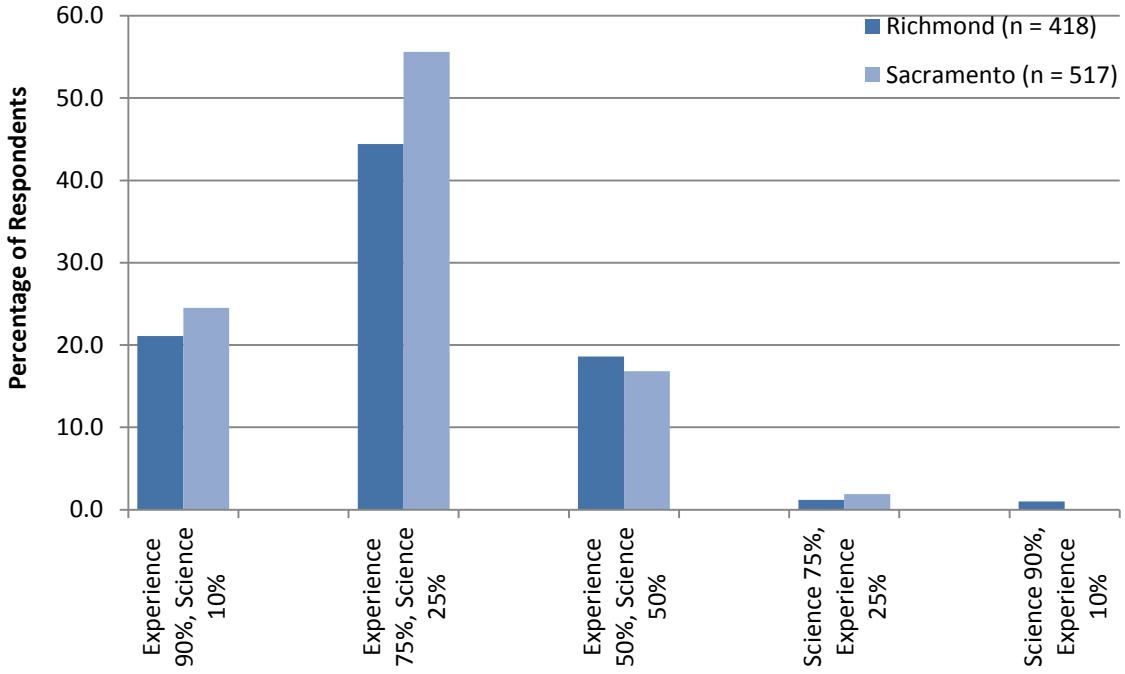

Figure 12 Officers' responses to "In day to day decision making, what do you think the balance should be between the use of scientific research/knowledge (e.g. from universities and research organizations) and personal experience?" in the SPD and RPD

Despite generally viewing experience as more important than scientific research in decision making, officers also tended to recognize the necessity for collaboration with researchers to better address crime (see Figure 13). Over 70 percent of officers in both agencies agreed or strongly agreed with the statement that such collaboration is necessary for a police agency to improve its ability to reduce crime (73.7 percent in the SPD, 70.5 percent in the RPD). Only about 2.5 percent of respondents in both agencies strongly

disagreed that collaboration with researchers is important for helping an agency to reduce crime.

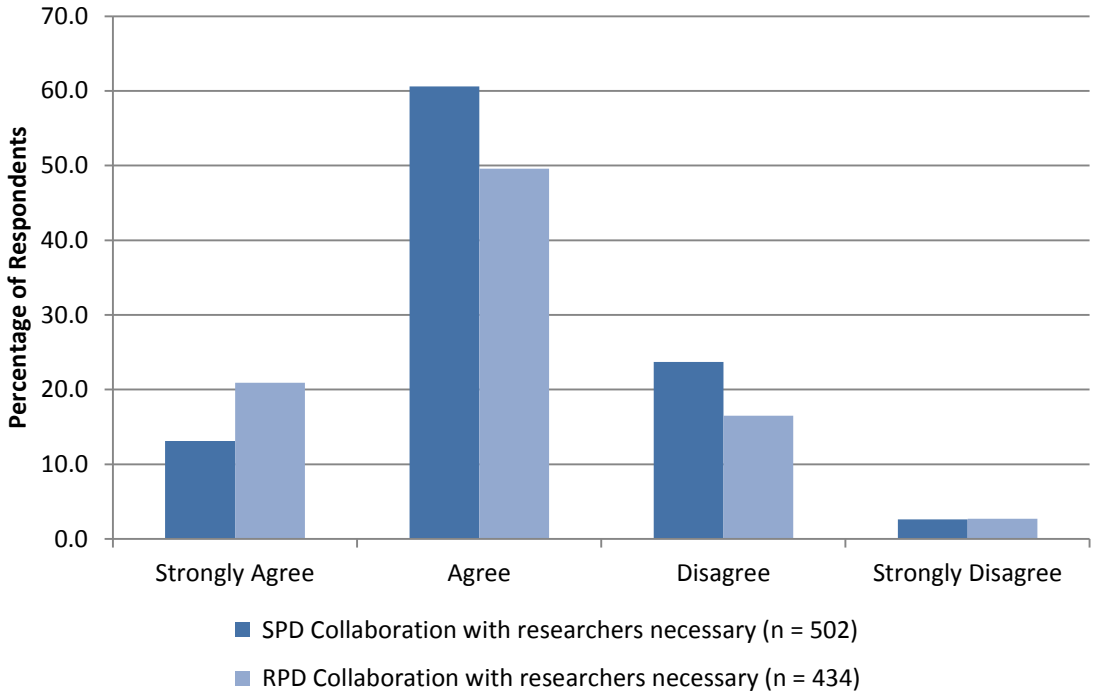

Figure 13 Officers' level of agreement to the statement "Collaboration with researchers is necessary for a police agency to improve its ability to reduce crime" in the SPD and RPD

Officers in both agencies also showed a strong willingness to try new things. The vast majority of officers in both the SPD and RPD either strongly agreed or agreed with the statement "I am willing to try new tactics or strategies, even if they are different from what I am currently doing" (see Figure 14). Only 4.8 percent of respondents in the SPD and 3.9 percent in the RPD disagreed or strongly disagreed with this statement, suggesting that officers are generally open-minded about trying new strategies and tactics.

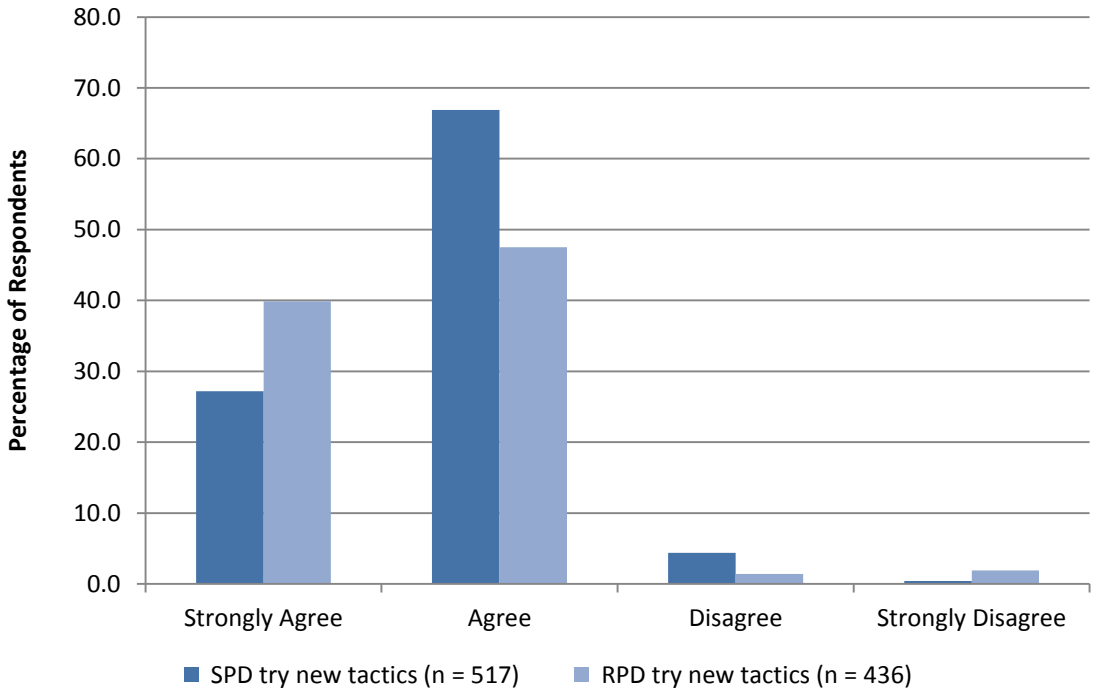

Figure 14 Officers' level of agreement to the statement "I am willing to try new tactics or strategies, even if they are different from what I am currently doing" in the SPD and RPD

In Figure 15 and Figure 16 are responses from two questions that ask officers about their willingness to take certain actions to test whether a particular tactic the police were using was effective. Officers were asked if they would be willing to implement a small randomized experiment by randomly selecting 20 areas where the problem occurs and using a coin flip to assign 10 to a treatment group that receives the tactic and 10 to a control group that does not. Just over a quarter of officers in the SPD (27.5 percent) responded that they were unwilling to do this, while just over a third were somewhat willing. About 36 percent of officers were either quite willing or very willing to try this method to evaluate a tactic. Results were fairly similar in the RPD although officers were

a bit more apprehensive about this method of evaluation, with 35.3 percent of respondents answering they were not willing to try a small randomized trial, and 26 percent of respondents saying they were very willing or quite willing to try this.

Officers in both agencies were much more willing to implement what is typically called a before/after design for evaluating a tactic. Over 62 percent of officers were quite willing or very willing to use data from before the tactic was implemented and compare it to data from after the tactic was up and running in the SPD. Just 5.2 percent of SPD officers were not willing to use this methodology. In the RPD, 58.9 percent of respondents were very willing or quite willing to use a before/after design and only 6 percent of respondents were unwilling to use this tactic. Overall then, officers are somewhat less likely to be willing to implement a more rigorous methodology to evaluate crime control effectiveness, although a sizable proportion of officers showed some willingness to try a small randomized trial.

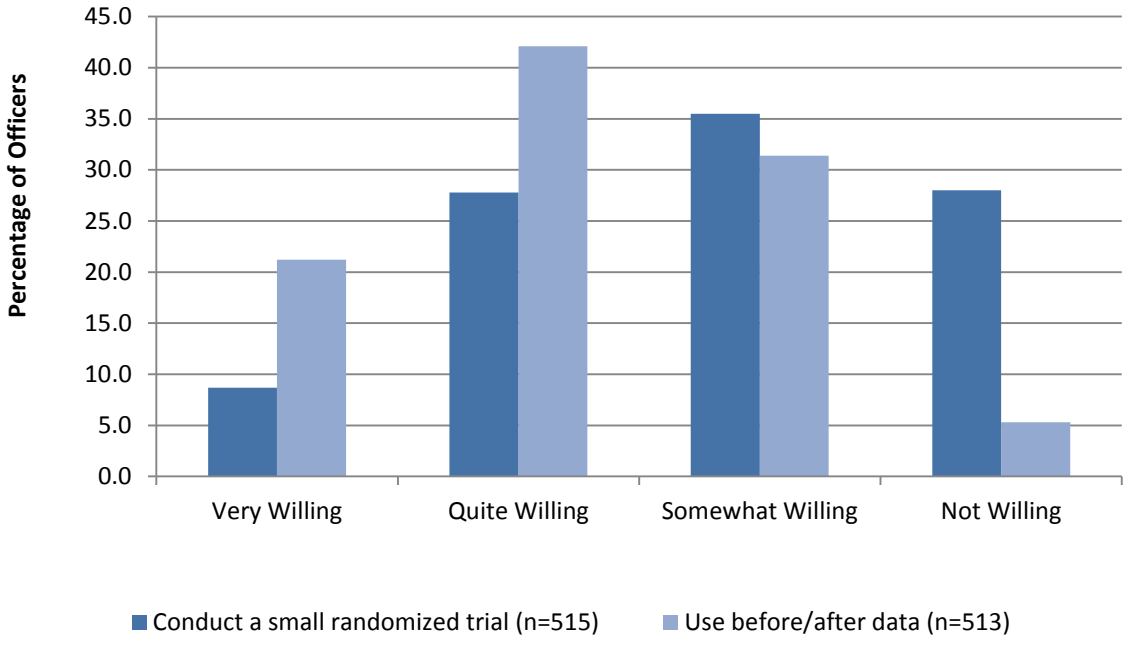

Figure 15 Officers' level of willingness to try the following methods to evaluate whether a tactic is effective: "Find the top 20 areas where this problem exists and toss a coin to assign 10 areas to have the tactic and 10 areas not to receive the tactic and compare it to data from after the tactic was up and running" in the SPD

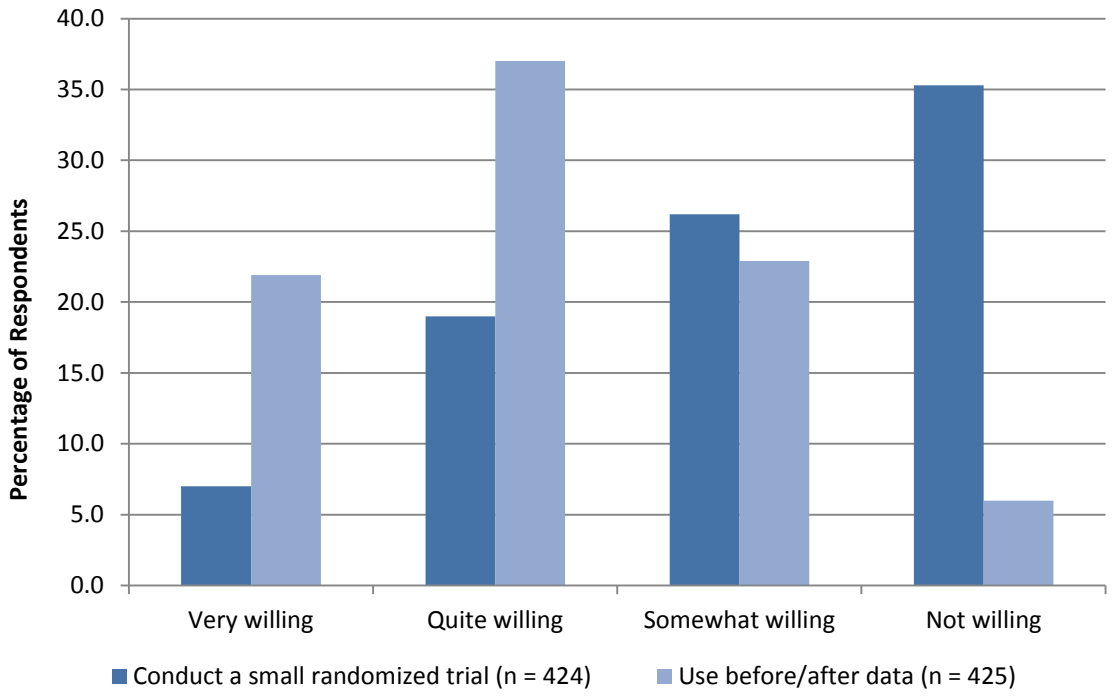

Figure 16 Officers' level of willingness to try the following methods to evaluate whether a tactic is effective: "Find the top 20 areas where this problem exists and toss a coin to assign 10 areas to have the tactic and 10 areas not to receive the tactic and compare it to data from after the tactic was up and running" in the RPD

In Figure 17 and Figure 18, we compare respondents' willingness to seek help from an outside researcher to evaluate a particular tactic to their willingness to ask someone within the organization for assistance in devising an evaluation method. While respondents in both agencies generally showed at least some level of willingness to use either method, officers were more likely to be willing to seek help from within their department than to ask for assistance from a university. In the SPD, only 9.8 percent of officers were not at all willing to consult with someone in the agency on an evaluation method compared to 31.2 percent who said they would not be willing to work with a researcher. The percentages for "not at all willing" in the RPD were lower, but the pattern was similar. Just over 6 percent of respondents were unwilling to work with

someone in the organization to devise an evaluation method compared to 19 percent who said the same for working with an outside researcher. Again though, while respondents seemed to feel more comfortable working with individuals within their agency to evaluate tactics, the majority of respondents showed at least some willingness to work with researchers from universities or research organizations.

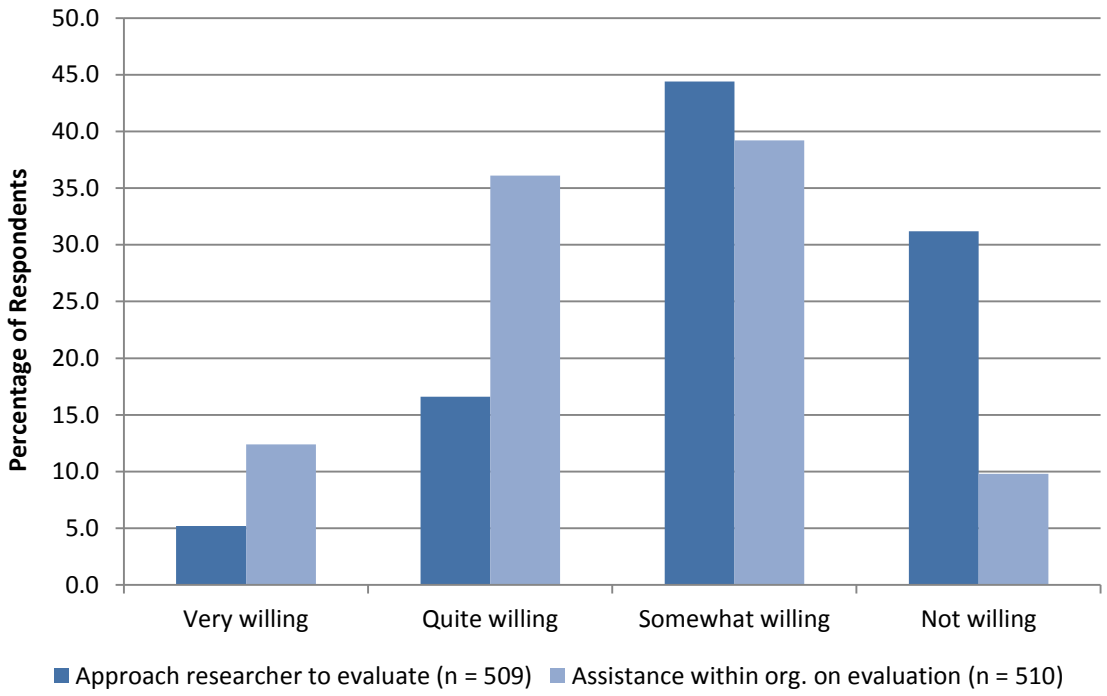

Figure 17 Officers' level of willingness to try the following methods to evaluate whether a tactic is effective: "Approach a researcher from a university or research organization to help you evaluate your tactic" and "Seek assistance from within the organization to create an evaluation method that would be acceptable to the organization" in the SPD

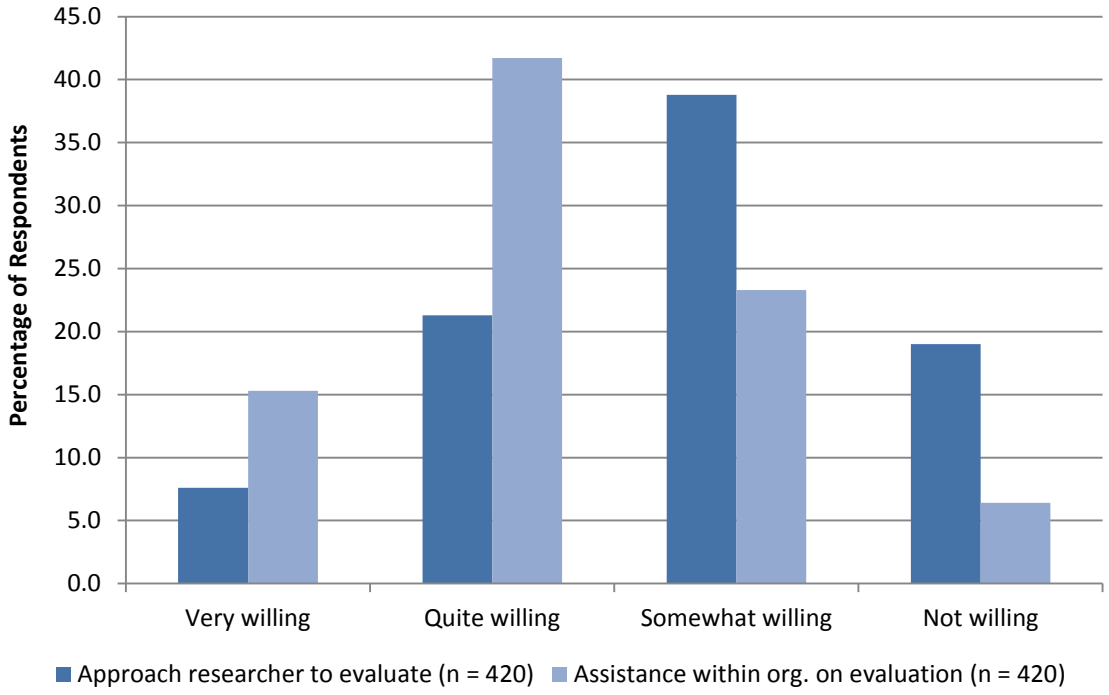

Figure 18 Officers' level of willingness to try the following methods to evaluate whether a tactic is effective: "Approach a researcher from a university or research organization to help you evaluate your tactic" and "Seek assistance from within the organization to create an evaluation method that would be acceptable to the organization" in the RPD

Finally, we present results on what respondents believed should be the minimum educational standard for new sworn recruits in the agency (see Figure 19). The SPD and RPD currently have different minimum education requirements. The RPD requires recruits to have a high school diploma (as do more than 80 percent of agencies nationwide; see Reaves, 2010), while the SPD requires recruits to have a minimum of 60 semester units of college credit, but there is no requirement for a specific degree.[42] These differences across agencies may help explain the widely divergent findings in Figure 19. Respondents in the SPD are much more likely to believe officers should have some post-

[42] This requirement can also be met by 90 quarter units. Technically, recruits can enter the academy with 42.5 semester units because they receive 17.5 semester units after completing the academy.

high school education than respondents in the RPD. While just 8.3 percent of RPD respondents believe the educational requirement should be raised to a bachelor's degree, 31.2 percent of SPD officers support this increase in standards. Still, even in the RPD, a majority of officers support increasing the educational standard with 50.5 percent answering that some college, an associate's degree, or a bachelor's degree should be required for new recruits. Thus suggests changing requirements is one method by which organizations could potentially change officer beliefs. For example, requiring greater officer exposure to crime analysis may increase receptivity towards analysis and may lead to greater use of materials from crime analysis. A required course on police effectiveness would likely increase the extent to which officer views on policing strategies are in line with research evidence. These agency-level initiatives to increase receptivity and research utilization are discussed more below and in chapter 6.

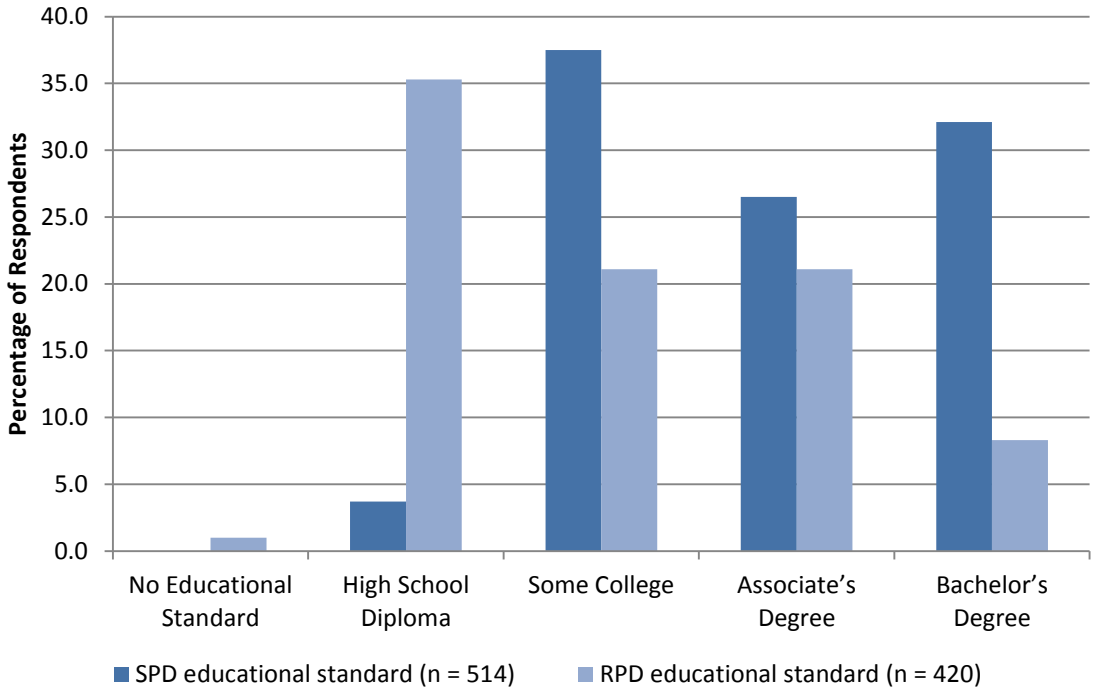

Figure 19 Officers' views on what should be the minimum educational standard for new police recruits in their agency in the SPD and RPD

Because of the exploratory nature of this initial assessment of officer receptivity, we were most interested in these descriptive findings above, but we also wanted to examine whether officer responses varied by departmental or demographic characteristics. Below, we examine the correlation between certain officer characteristics and responses. Overall, only a small number of questions are significantly correlated with personal characteristics, and these correlations tend to be quite low in magnitude. Thus, our findings are similar to those of Weiss and Bucuvalas (1980), who concluded that personal characteristics did not play a major role in research receptivity among mental health providers.

Results by Officer Characteristics

We were interested in whether officers' personal and departmental characteristics had some impact on their responses. As an initial assessment, we examined correlations between responses in the SPD and RPD and three characteristics: years of experience, respondent gender, and respondent level of education.[43] We also examined whether respondent views differed based on sworn status in the RPD. Across both agencies, the number of significant correlations was low, and most of these significant correlations were small in magnitude. In Table 12, we present questions that had a significant correlation of at least 0.20 in magnitude with one of these characteristics in the RPD or SPD (or both). There were seven significant correlations in the RPD (four for level of education, one for gender, and two for sworn status) and two in the SPD (both for level of education).

In both agencies, the strongest correlations, perhaps not surprisingly, were between respondent level of education and views about the importance of education and what the minimum education standard should be. Better educated officers tended to believe higher education was more important for policing and that the minimum standard required for new recruits should be higher. In the RPD, more educated officers were also more likely to show willingness to use before and after data to evaluate a strategy and to stop a tactic that a researcher said was ineffective. These significant correlations did not

[43] We focused on these three characteristics in part because they were well measured in both agencies (see our discussion section for issues related to measuring officer race), and because these were characteristics described in prior research as potentially relevant. In both departments, officer years of experience was significantly and highly correlated with officer rank, so our years of experience variable is also, to some extent, capturing responses by rank.

emerge in the SPD, however, suggesting that is not clear whether higher education can be one way to increase officer receptivity to evaluating the effectiveness of crime control tactics. It is also the case that the higher minimum educational requirement in the SPD means that there is less variation in educational level in our SPD sample, potentially making it more difficult to identify relationships between education level and receptivity.

In the RPD, one question was significantly correlated with respondent gender. Female officers were more likely to respond that research evidence should play a greater role in day-to-day decision making. An examination of the responses by gender suggests that female officers were less likely to say that experience should be most important and scientific knowledge should play little role and were more likely to say both that experience and scientific knowledge should play an equal role and that scientific knowledge should be most important. The correlation was significant for this question in the SPD as well, although of a lesser magnitude. Thus there is some suggestive evidence here that female officers may be more receptive towards using research (as opposed to experience) to guide practice, although we must be cautious in drawing any strong conclusions from these data. Empirical research examining gender differences in officer attitudes across a number of areas has generally found few significant differences (see Poteyeva & Sun, 2009). Cochran, Bromley, and Swando (2002), for example, found no difference between male and female sheriff's deputies in their receptivity towards an organizational shift to community policing. Future research should further examine the relationship between gender and receptivity to using scientific research.

Two questions were correlated with the respondent's sworn status in the RPD (only sworn officers were surveyed in the SPD). Civilian employees compared to sworn officers were more likely to say that research evidence should play a greater role in day-to-day decision making compared to experience. The correlation between sworn status and gender is significant and moderate in magnitude (0.329), suggesting some of the correlation between gender and this question may be explained by sworn vs. civilian status in the department. Civilian respondents were also less likely to agree with the statement, "When a new idea is presented from top commanders, it is usually a fad, and things will eventually return to normal." While we did not detail findings on this question above, officers in both agencies tended to show some skepticism about new ideas being a fad, while civilian employees were more likely to disagree or strongly disagree with this statement.

In both agencies, none of the questions was significantly correlated with a magnitude of 0.20 or greater with respondent years of experience, suggesting limited variation across respondents based on years of service.

Table 12 Significant correlations between responses and officer characteristics in the SPD and RPD

Question	***Characteristic***	***Corr. SPD***	***Corr. RPD***
Use before/after data in evaluation	Education	-.015	.202***
Stop tactic because researcher said ineffective	Education	-.002	.226***
How important is higher education?	Education	.344***	.231***
Minimum educational standard	Education	.365***	.298***
Balance scientific research and experience	Gender	.089**	.204***
Balance scientific research and experience	Sworn	N/A	.247***
Is new idea presented a fad?	Sworn	N/A	.225***

* $p < .10$ ** $p < .05$ *** $p < .01$

How Well Do Respondents' Views on Evaluation Hold Together?

As a final assessment of officer responses, we wanted to examine whether or not officer views on particular survey questions seem to hold together well. In other words, can officer responses to particular questions be combined in a scale or factors in meaningful ways? We focus here on one area where we asked respondents a number of questions: the willingness of officers to use different strategies to evaluate police tactics. Below we use principal components analysis (Joliffe, 2002, 2005) and Cronbach's alpha (Cronbach, 1951) to examine whether it would be reasonable to reduce the number of variables capturing views in this area. Principal components analysis is a data reduction tool similar to factor analysis used to create a smaller set of components that ideally capture a substantial proportion of the variance from the original variables. Cronbach's alpha is a reliability measure to examine the internal consistency of items in a scale to assess how reliably the items are tapping into a single construct. While the current study does not use multivariate modeling, we view these analyses as an important first step in future efforts to assess officer views using regression models as we continue to expand our database of officers.

The eight questions about evaluation methods seem to hold together particularly well in terms of internal consistency (see question 2 in section D of the survey in Appendix A). If the items are combined into a scale, the Cronbach's alpha is 0.826 in the RPD and 0.769 in the SPD, which both exceed the conventional standard of 0.700 for a

reliable scale (Nunnally & Bernstein, 1994). In both agencies, removing any item would lower this measure of internal consistency, suggesting that no single question is negatively affecting the scale. All eight of these questions ask about an officer's willingness to do particular things related to evaluating the effectiveness of crime control tactics and so these alphas suggest that officers who show willingness to engage in some of these evaluation approaches are also likely to be willing to try others. In other words, respondents are more likely to respond the same way to every question (be it "not at all willing" or "very willing") than they are to vary their responses greatly based on the evaluation method. There still exists variation from question to question, as we saw above, but this suggests that increasing officers' willingness to engage in any of these evaluation approaches may have beneficial impacts on their willingness to try other evaluation methods.

In both agencies, principal components analysis suggested two components could be retained (i.e. had eigenvalues greater than 1). These two factors explained 64.3 percent of the variance in the RPD and 57.9 percent in the SPD. In Table 13, we present component loadings for each of the eight questions in both agencies. These findings suggest that in both agencies all of the questions are loading very well (i.e. component loadings greater than 0.50) on the first component, adding support to the idea that these eight questions could be a reliable scale for assessing officer views on conducting evaluations. In both agencies, the first question (stop the tactic to see if the problem gets worse) is the only one of the eight to load better on the second component than the first. Officers in both agencies were typically very unwilling to use this approach and this

makes sense as it involves changing police strategy without conducting an evaluation. Thus while all eight questions together can create a reliable scale, the principal components analysis suggests that a seven item scale may better reflect officer views on evaluation methods.

Table 13 Component loadings for evaluation questions in the SPD and RPD

	SPD		***RPD***	
Question	*1*	*2*	*1*	*2*
Stop tactic to see if problem worses	.561	.626	.561	.626
Stop tactic one area, compare to other area	.632	.579	.632	.579
Small randomized trial	.583	.452	.583	.452
Use before/after data	.670	-.091	.670	-.091
Approach researcher	.649	-.346	.649	-.346
Seek assistance in organization	.634	-.442	.634	-.442
Online research	.654	-.544	.654	-.544
Stop tactic if researcher said ineffective	.559	-.104	.559	-.104

Summary of Findings

Overall, our findings suggest both good news and bad news in terms of efforts to move forward with evidence-based policing. In Table 14 we compare some of our findings from the SPD and RPD to an agency in California where we piloted the receptivity survey to 50 sworn officers. At the time, this agency was among the most progressive in the nation, and so we would expect that officers surveyed in the pilot site would be on the high end in terms of receptivity to research and evidence-based policing.

We start with some of the bad news. In both the SPD and RPD, there were low levels of familiarity with the term evidence-based policing (particularly when compared

to the pilot agency) and officers were generally not exposed to research findings through either the academic or professional literature. This suggests that simply publishing articles, even in outlets such as *The Police Chief* or *FBI Law Enforcement Bulletin*, will not be a sufficient way for researchers to better expose officers to research findings. In terms of an understanding of the research evidence, there was both good news and bad news. Officer views were generally in line with the evidence for some tactics, such as D.A.R.E. and problem-oriented policing, but not as much for others, like rapid response to 911 calls. Interestingly, as the table suggests, officers were much more negatively disposed towards hot spots policing in the SPD than the RPD. We revisit this issue below.

We also see some variation across agencies in some of the questions. Respondents in the RPD report using materials from crime analysis more often than those in the SPD, although in both agencies a sizable proportion of officers are using such materials rarely or not at all. Respondents in the SPD were much more likely to respond that they find information from research very or somewhat useful compared to the RPD. This variability across agencies highlights the importance of agency-level contextual factors in explaining officer responses. This variation also suggests that organizational practices and policies can impact officer views towards receptivity and using research in practice, an issue we revisit in chapter 6.

The last two rows of Table 14 suggest some generally good news. Across all of these agencies, officers were very willing to try new tactics, even if they were different

from what they had been doing. Respondents also tended to agree that collaboration with researchers is necessary for an agency to most effectively address crime and disorder.

Table 14 Comparison of survey responses from the SPD, the RPD, and a pilot agency

Question	***Sacramento***	***Richmond***	***Pilot***
Heard of evidence-based policing	25%	30%	80%
"None of the above" knowledge sources	77%	62%	46%
Hot spots policing very effective/effective	20%	59%	74%
Use materials from crime analysis often/sometimes	37%	54%	56%
Information from research very/somewhat useful	71%	45%	76%
Willing to try new tactics (strongly agreed/ agreed)	94%	87%	96%
Collaboration with researchers is necessary (strongly agreed/ agreed)	74%	71%	90%

Discussion and Conclusions

Our findings add to the limited existing research on police officer receptivity to evidence-based policing and research. We discuss some of our most interesting results below, focusing in particular on areas that need to be addressed to more effectively move forward with evidence-based policing. An additional key question is how can we best increase research utilization in police agencies? We save our discussion of this important issue for chapter 6.

A first important finding from both the SPD and the RPD is that the term "evidence-based policing" is not part of the vocabulary of the majority of our respondents. While the evidence-based movement has grown in policing and a number

of fields in recent decades, the terminology may not be as familiar to police practitioners. Additionally, officers typically are not reading either academic or professional journals to learn about research and the effectiveness of police tactics, and most information they are receiving is coming from their agency. This suggests researchers should be careful in how they present and advocate for evidence-based policing as academics and practitioners may not be speaking the same language when it comes to making the police more evidence-based (see Innes & Everett, 2008). Researchers also must think more about effective dissemination channels for research. Based on prior research (and our own experience with police practitioners), we were not surprised that officers were not typically sitting down to read the latest issue of *Criminology*, but we did not expect the percentage of respondents answering "none of the above" to our list of knowledge sources to be so high. Clearly, even publishing pieces in *The Police Chief* or other practitioner-oriented outlets is insufficient to ensure officers are exposed to research.

One effective approach may be to use departmental distribution channels as a sizable proportion of officers did report receiving information on effective practices from their own agency. Researchers could, for example, work directly with departments to disseminate information on effective practices during in-service or academy training. As part of the Matrix Demonstration Project, Lum and colleagues have developed a four part, freely available video training module on evidence-based policing that would be useful in exposing new recruits to effective practices and the concepts behind evidence-

based policing.[44] Efforts such as this could be useful in ensuring that officer views on the effectiveness of particular strategies and tactics are in line with research, particularly more traditional patrol strategies, which officers often overestimate the effectiveness of.

Our findings on the relationship between officers and crime analysts suggest variation across the two agencies. Respondents in the RPD were much more likely than those in the SPD to use materials from crime analysis often; in the SPD over 60 percent of officers used materials from crime analysis rarely or never. While close to 30 percent of RPD respondents were using such materials often, this still suggests the majority of officers are not. In both agencies, about a quarter of respondents said the work of crime analysts was very useful or an integral part of day-to-day operations, again suggesting room for improvement. There is little evidence of direct animosity towards analysts, as only a handful or respondents were unaware whether analysts existed in the agency and smaller percentages responded that the work of analysts was not at all helpful or not integral to day-to-day operations. It seems that educating officers about what crime analysts do and the usefulness of materials they can produce might be beneficial in increasing officer-analyst interaction and ensuring that officers are basing strategies and tactics on the best possible data and analysis (see Lum et al., 2012).

We also see variation in officer views about the effectiveness of certain policing innovations. While respondents in both agencies showed largely similar views that were in line with the research evidence for strategies such as problem-oriented policing and D.A.R.E., there was great divergence regarding the effectiveness of hot spots policing.

[44] See http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/evidence-based-academy-curriculum/ to view the videos and study guide for the module.

Officers in Sacramento generally had very negative views regarding the effectiveness of hot spots policing, despite the fact that the agency was involved in a successful hot spots experiment (see chapter 4). It is not clear exactly what is driving these negative views, but one possibility is officer backlash to the experiment and the changes in officer routines that the experiment required (see chapter 6). The experiment, however, was only implemented in two of the city's six districts and was only carried out 16 hours a day, so these findings from such a large number of officers, many of whom were not likely involved at all in the experiment, are difficult to explain. The results in the SPD suggest though the difficulties departments face in implementing and institutionalizing evidence-based policing. One can imagine the backlash supervisors and managers could face in rolling out hot spots policing citywide when only 1 in 5 respondents rated the approach as effective for addressing crime. As we described above, Weiss and Bucuvalas (1980) find respondents tend not to be receptive to research that does not fit in with their beliefs and attitudes, and hot spots policing certainly does not seem to fit in well with the beliefs of the majority of our SPD respondents. This reinforces the importance of better informing officers about the evidence base (i.e. that hot spots policing is effective), although just providing the information may be insufficient. We discuss these challenges in moving forward with evidence-based policing in Sacramento more in chapter 6 and focus on strategies to help increase the likelihood of research utilization in practice.

In terms of officer views on the usefulness and value of research, we see what at first might seem to be contradictory findings. Officers in both agencies overwhelmingly tend to believe that experience should play a greater role than scientific knowledge in

guiding day-to-day decision making, but about 70 percent of respondents also strongly agree or agree that collaboration with researchers is necessary for a police agency to improve its ability to reduce crime. Based on their views on the importance of personal experience in guiding decision making, one might assume that officers place a low value on scientific research, and while we did see variation between SPD and RPD respondents in their views on the usefulness of research (with RPD officers finding scientific research much less useful), officers in both agencies recognize the importance of research evidence to help make their department better at fighting crime. This also suggests an important lesson for academics: police-practitioner collaborations are likely to be more successful when officer experience is valued and taken advantage of in the design and implementation of any intervention. If officers feel their experience and street-level knowledge is being put to good use in designing a crime control approach, they are more likely to buy in and be cooperative (see Toch, Grant, & Galvin, 1975). Officers value the expertise of academic researchers, but they still value their own experience more, and researchers should be aware of this as they design and evaluate new approaches. We discuss this issue further in chapter 6.

An especially exciting finding is how open officers seem to be to trying new things. Only 3 percent of officers in the RPD and 5 percent in the SPD disagreed or strongly disagreed with the statement "I am willing to try new tactics or strategies, even if they are different from what I am currently doing." While change can be difficult for any organization, this open-minded attitude towards doing new things suggests a general receptivity to changing strategies or tactics in light of research evidence. Of course, there

also is some skepticism from officers about trying new things. In the SPD, about three-fourths of officers agreed or strongly agreed that when a new idea is presented from top commanders, it is usually a fad, and things will eventually return to normal. About 65 percent of respondents in the RPD agreed or strongly agreed with this statement, suggesting that officers are willing to try new things, but the burden is on the agency and top commanders to show a long-term commitment to change.

We found overall that officers were at least somewhat willing to engage in a number of evaluation methods to assess the effectiveness of police tactics. Officers tended to show greater levels of willingness to engage in less rigorous approaches and more reluctance to engage in approaches with higher internal validity, such as randomized trials. While any sort of evaluation would be more beneficial than not assessing at all the impact of police strategies and approaches, we emphasize the importance of officers and agencies using the most rigorous approaches possible when examining questions of effectiveness. More rigorous research methods will produce more believable findings that can be used to guide policy and practice with greater confidence. As McCord (2003) has emphasized, only randomized experiments and other rigorous methods can help ensure that police treatments are doing more good than harm. McCord (2003) points to the example of Scared Straight programs, which showed evidence of effectiveness in initial before/after trials, but which were found to be harmful in later randomized experiments that suggested juveniles exposed to the programs were at a greater risk for future offending. Von Bubnoff (2008) has documented similar cases in medicine, where conclusions from epidemiological research examining correlations

between risk or protective factors and diseases have often been disproven by later experimental trials that show that these correlations were not causal.

Finally, we included questions on police education in our survey because of the intuitive link between higher education and evidence-based policing. As Weisburd and Neyroud (2011) have argued, college-educated officers may be more exposed to the research evidence and more receptive to using rigorous science to guide practice. Our strongest finding with regards to education was that more highly educated officers value higher education. While this suggests that officers who receive more than a high school education value their education and believe it is important for other officers, it tells us less about how education is related to moving forward with evidence-based policing. There was some evidence in the RPD that more highly educated officers were more willing to engage in certain evaluation approaches, although more research is needed as these significant correlations did not emerge in the SPD. We can thus draw no strong conclusions about whether or not recruiting and hiring more highly educated officers will aid in efforts to make policing more evidence-based.

While our study adds to the limited existing literature on police officer receptivity to research, our research is not without limitations. Our survey focuses on issues related to receptivity to evidence-based policing and evaluation research, but in an effort to more carefully explore these issues we chose not to focus on issues related to research utilization. Thus, we do not have data on how often officers are using evidence-based approaches in the field and to what extent they are using specific pieces of research to

guide their strategies. As we note below, better understanding the use of research in practice is an important area for future research.

Our biggest limitations concern missing data and officer veracity in completing the surveys. The questions were all fairly innocuous and so we see no reason for officers to not be honest in their responses, but we also do not know to what extent officers took the survey instrument seriously and carefully answered the questions. Indeed, as noted above, the largely negative views on hot spots policing in the SPD could reflect officer dissatisfaction with having to take the survey and the involvement of the agency in a hot spots experiment (see chapter 4). Missing data was also a problem throughout the survey, particularly on demographic questions such as race. Officers were often reluctant to provide identifying information on the survey, which as we noted above limits our ability somewhat to assess the representativeness of the samples in these agencies. For example, about 1 in 5 respondents in the RPD (20.7 percent) did not answer the race question. In the SPD, we used an open-ended race question,[45] which 9.6 percent of officers left blank. An additional 7.7 percent provided unclear answers (e.g. American) or wrote-in answers making it clear they did not want to provide their race (e.g. N/A, declined). Still, in the SPD we sampled over 75 percent of officers, and in the RPD we surveyed about half of sworn officers, suggesting at least some level of representativeness.

[45] We initially used an open-ended race question in the SPD that just asked officers to provide their race in a text-box. Because of the wide variety of responses we received and the difficulty in coding some of these responses, we switched to a close-ended race question using standard U.S. Census categories for the RPD.

Finally, we also emphasize that while we think these findings provide new insight into issues of research receptivity in policing, our results are only statistically generalizable to the sample of officers in Sacramento and Richmond that completed the survey. Our convenience sample of two agencies is not sufficient to make strong statements about receptivity in American policing more generally. Both the SPD and the RPD are fairly large agencies serving major urban centers, and so we might expect variation in responses from officers in different contexts. Just as we saw many similarities between Sacramento and Richmond, but some differences also emerged, we suspect that findings in different agencies would echo these results in some ways while diverging in others. Better understanding and identifying these areas of divergence are important avenues for future research, because they are suggestive of the importance of agency-level factors. In other words, identifying why officers in the RPD recognize the effectiveness of hot spots policing to such a greater extent than officers in the SPD may be important in efforts to build officer receptivity to hot spots approaches. What is RPD doing, or what is SPD not doing that could explain these differing results? On the other hand, some of our results, such as the consistent finding that officers value experience more than scientific evidence, could be attributable to aspects of the policing profession rather than agency-level factors, and thus for certain questions we would expect greater similarity in findings across a larger sample of agencies. We plan to continue to expand our database of respondents in an effort to enhance our ability to generalize more widely. We recently completed survey administration in Roanoke County, Virginia, survey

administration is underway to officers attending courses at the Southern Police Institute,[46] and we plan to survey additional agencies in the near future.

Conclusions

Our study was among the first to examine issues of officer receptivity to research and evidence-based approaches in policing. While our results are largely descriptive, we think these preliminary analyses help shed new light on issues of receptivity and suggest both prospects and pitfalls in efforts to move forward with evidence-based policing. Future research should continue to explore these issues with additional agencies, perhaps expanding or using other surveys to better understand research utilization, an issue we further explore in chapter 6. As our sample size increases, so will our ability to further generalize about receptivity to research in American policing. Future research should more closely examine the effects of both individual officer-level factors and agency or jurisdiction-level characteristics in multivariate models and potentially in multilevel models. This would shed further light on variation both within and across police agencies. Future studies should also attempt to assess change over time in receptivity at both the officer and agency level, particularly as a result of agency research efforts or interventions designed to expose officers to policing research and evaluation.

Finally, future studies should devote more attention to the issue of theory in research on receptivity. Our findings here were largely descriptive and not guided by a

[46] We thank Tad Hughes, Director of the Southern Police Institute at the University of Louisville, for his assistance in overseeing survey administration at the Southern Police Institute.

particular theoretical perspective, but in moving forward with understanding police receptivity to research, theory should play an important role. Indeed, the continued expansion of our officer sample should help in theory-building efforts. As Lum and colleagues (2012: 70–71) noted in describing the receptivity survey, "For researchers, the survey provides more empirical data to develop theory in this area and to test factors contributing to (or inhibiting) the use of research in practice." These issues are critical to examine because evidence-based policing cannot become a reality without acceptance and support from officers in the field.

CHAPTER 6: CONCLUSIONS

This dissertation has focused on moving forward with evidence-based policing, concentrating in particular on the tactics officers should be engaging in to most effectively reduce crime and disorder. This concluding chapter first briefly reviews the goals of this dissertation and what has been learned about efforts to move forward with evidence-based policing before an in-depth discussion of an important issue initially raised in chapter 5: what should be done to increase the utilization of research in policing? Using literature from a number of fields, this section describes models and prior efforts to bring research into practice. Suggestions for future research are then reviewed before final concluding remarks.

Research utilization is an appropriate final substantive topic for this dissertation because institutionalizing the use of research evidence in practice is the final crucial step in moving forward with evidence-based policing. There really is no moving forward if police are not using research to help guide practice and day-to-day decision making. The discussion below helps bring together the other chapters and articles in this dissertation. We focus on three main questions in the section below. First, how do we get police agencies to use the advice provided in chapter 2 and chapter 3? Second, how do we ensure that interventions such as the hot spots experiment discussed in chapter 4 lead to long-term changes in patrol and deployment strategies? Finally, how can we use the

lessons we learned in chapter 5 on officer receptivity to research to guide efforts to increase utilization? Despite the importance of research utilization, this interestingly is not an area that has received much attention in research on policing or criminal justice more generally. We turn to a more detailed discussion of this important issue after first briefly summarizing what we have learned in prior chapters.

Summary of Prior Chapters

This dissertation set out to address three major questions described in chapter 1. The first was what does the research evidence suggest police should be doing? Specifically, this dissertation has been focused on drawing lessons for agencies and officers on how specifically they should be implementing evidence-based strategies. These reviews of what the police should (and should not) be doing in chapter 2 and chapter 3 drew upon both primary studies and systematic reviews of the policing literature. These overall summaries of the state of the policing evaluation literature were focused on establishing what we do and do not know about what works in policing and providing advice for how agencies can best address crime and disorder problems in the communities they serve. Overall, these chapters generally emphasized the effectiveness of strategies focused on specific high-crime places (e.g. hot spots policing, directed patrol to reduce gun violence) and high-crime people (e.g. focused deterrence strategies).

A second question addressed in this dissertation was what does evidence-based policing look like in action? Can agencies successfully use the lessons presented in

chapter 2 and chapter 3 to design and evaluate evidence-based approaches? An evaluation of a hot spots policing experiment in Sacramento, California in chapter 4 suggested that interventions using tactics guided by prior research could be successful in reducing overall calls for service and crime incidents in targeted hot spots.

The Sacramento experiment involved the application of the "Koper curve" principle (see Koper, 1995) in treating high crime areas. Officers randomly rotated between hot spots during their downtime between calls for service, spending about 15 minutes in each hot spot in an effort to maximize deterrence. In a sample of young adults, Loughran and colleagues (2011) find some support for the idea that increasing levels of ambiguity in punishment can increase deterrence because individuals tend to be "ambiguity averse." However, in a sample of juvenile offenders, increasing ambiguity was only effective for increasing deterrence in non-contact (e.g. property) crimes, but in the case of contact (e.g. violent) crimes, ambiguity actually increased the likelihood of offending when the perceived risk of detection was low. This suggests the model in Sacramento may have varying effects depending on both crime type and type of offender. These issues were not examined in chapter 4, but are worthy of future research. Despite these mixed findings, Loughran et al. (2011: 1056) emphasize the potential benefits of a "Koper curve" hot spots policing approach, noting, "With the same amount of resources, an alteration of police policy by manipulating the ambiguity of the certainty of arrest would enable them to enhance the deterrent effect they have. Our finding with respect to ambiguity suggests it would be worthwhile for law enforcement to exploit any vagueness in perceptions of the risk of punishment."

The Sacramento study was especially relevant for this dissertation because the experiment was undertaken with existing departmental resources (i.e. no overtime was used) and with only limited consultation with researchers. The police department took the initiative to design and implement a strategy based on scientific evidence about what works best, suggesting a model for moving forward in evidence-based policing.

A third and final question addressed in the prior chapters was what challenges exist in moving forward with evidence-based policing? The primary challenge considered in chapter 5 concerned officer receptivity to research and evidence-based policing. The main questions addressed were do officers have an understanding of what works in policing, and are they willing to be innovative and evaluate the effectiveness of their tactics and strategies? Survey responses from officers in the Sacramento Police Department and the Richmond Police Department suggested both prospects and challenges that exist in trying to institutionalize the use of science to guide departmental practice. For example, in both agencies major challenges include low levels of familiarity with the term evidence-based policing and a lack of exposure to information about policing research evidence. Major prospects for moving forward include the fact that officers were very willing to try new tactics in both agencies, even if they were different from what they had been doing, and respondents tended to agree that collaboration with researchers is necessary for an agency to effectively address crime and disorder.

Increasing the Use of Research in Practice

The focus of chapter 5 was police officer receptivity to research and evidence-based policing. That chapter examined officer understanding of and views about the research evidence and using evaluation to examine the effectiveness of tactics. While these data shed new light on issues of officer receptivity, they do not address another important issue in moving forward with evidence-based policing, research utilization. That is, to what extent are officers using research in their day-to-day work, and what can be done to increase this use? As with receptivity, the research utilization literature in policing is very limited, although this topic has generated more research in a number of other fields, particularly in the health-related professions. Research utilization is a topic worthy of extended discussion because receptivity is only a first step in making evidence-based policing a reality. Despite this, as Cherney (2009: 244) points out, "what is surprising is that the research utilization literature has had only a marginal impact on crime prevention scholarship." Utilization more closely considers actual practice and how this does or does not match up with the evidence from rigorous research. The section below uses the survey findings from chapter 5, as well as the lessons from chapters 2-4, to provide suggestions on how to best move forward in getting officers to make use of research and engage in the specific tactics most strongly linked to effectiveness.

What is research utilization?

As in chapter 5, the influential research of Carol Weiss is a good starting point for a discussion of research utilization. Weiss (1977, 1979) makes clear that the term "research utilization" does not have a simple definition and there are at least seven different ways that research can be utilized by practitioners and policymakers. The first ways are more instrumental; specific research is used to provide a clear change in policy or practice. In the knowledge-driven model, research drives the creation of some new technology or product that becomes widely diffused and used. Such a model is not particularly likely to occur even in the natural sciences, where there are examples Weiss (1979) points to (e.g. birth control pills, advances in television technology). In the social sciences, such a model is even rarer because social science research rarely is unambiguous and infrequently leads to the creation of any sort of new technology or product. Problem-solving approaches involve making use of research to address a public policy issue. Prior research is utilized or new research is conducted specifically to guide a policy or practice decision. This model of utilization is appealing to researchers, because research here has a clear impact on policy and practice. Weiss (1979) cautions, however, that such instrumental uses of research are fairly uncommon, because of the complexities of the policy and practice world (see Weiss, 1977).

As Cherney (2009) emphasizes, the instrumental use of research is often emphasized in criminal justice and policing. Hot spots policing, for example, diffused across American policing, in part because of basic research demonstrating the high levels of concentration of crime at small geographic areas and applied research suggesting that

when police focus in on these high crime places, they can have a significant impact on crime and disorder (Weisburd & Lum, 2005; Weisburd & Braga, 2006b). Similarly, problem-oriented policing is based on the problem-solving model that Weiss (1979) describes. Under the SARA model (Eck & Spelman, 1987), research and careful analysis of a crime problem directly lead to the development of a tailored response. These instrumental uses of research, however, are not the only way research can affect decision making.

Weiss (1979) also points to other less direct ways in which research use can have some impact on policy and practice. In the interactive model, research is one part of a complicated world of policymaking, in which decision makers are interested in research, but also seeking advice from a number of other sources (e.g. interest groups, the public, politicians). Criminal justice policymaking and practice often faces a diverse group of actors who want to influence the final outcome. Research can also be used as political ammunition. Research findings supportive of a policymaker's personal political views may be touted, although this policymaker would likely be unconvinced by contrary findings. This occurs frequently in criminal justice, particularly on contentious issues like gun control. In the tactical model, the idea that research is being done is used more than the actual findings. Research can be used, for example, to delay action or to show that an agency is progressive. In the enlightenment model, specific research findings from a single study are not affecting policy as much as decision makers will say "social science research has given them a backdrop of ideas and orientations that has had important consequences" (Weiss, 1979: 430). Finally, Weiss (1979) points to research as

part of the intellectual enterprise of society. In other words, research interacts with and is affected more generally by policy and society as a whole.

These non-instrumental approaches, while more complex, are important to consider in policing and crime prevention because "crime prevention problem-solving demands that evidence is also used conceptually in order to tease out the multi-dimensional nature of crime and safety problems" (Cherney, 2009: 246). Conceptual utilization can be important in developing the baseline knowledge necessary for instrumental use to occur. As Nutley, Walter, and Davies (2007: 307) note, "conceptual uses of research, which contribute to subtle but potentially weighty shifts in knowledge, understanding and discourse, can be hugely significant in policy and practice." Additionally, even exposing police practitioners and policymakers to research may have an enlightening effect that is difficult to measure in any sort of instrumental way, but which may have a longer-term impact on receptivity to using and generating research.

Similarly, Nutley and colleagues (2007) also point to multiple ways research can be useful to practitioners and policymakers. They note three main uses of research for agencies. First, and perhaps most obvious, research can provide agencies with knowledge through the actual products produced by the research, such as articles and final reports. Ideally, these products are useful for making decisions, but direct knowledge is not the only way research can be useful. A second benefit is exposing practitioners to the research process. As Nutley et al. (2007) note, conducting evaluation research in an agency, particularly when the agency takes the lead, as in chapter 4, provides valuable skills and knowledge to individuals within the agency on what good

science looks like. This greater exposure to the research process more generally can have important implications for future receptivity to evidence and evaluation research. Finally, research can lead to the production of useful tools, products, and protocols that can be applied to agency strategies and problems. In policing, for example, the Evidence-Based Policing Matrix (Lum et al., 2011) is a good example of a tool designed to translate research findings visually for practitioners. The Matrix is designed to not only provide knowledge on specific studies, but also to aid in drawing generalizations from the body of rigorous policing research and serve as a tool for helping agencies develop strategies that take advantage of lessons from existing research.

Overall then, research utilization is not a simple concept, and increasing it is not an easy task (Weiss, 1977). This is, in part, because most government institutions are reluctant to make major changes, even when presented with persuasive research evidence. As Weiss (1977: 9) notes, "not only courts but other governmental units have an enduring respect for order. When the implementation of research threatens to bring about rapid change—topple existing procedures, call for new arrangements and new skills, create a time of confusion and uncertainty, open the gates to more strident demands for further change—then governments often tend to prefer the ills they have than the disorder attendant on even beneficent change" (p. 9). Policymakers and practitioners are also often skeptical of research findings that seem tentative and do not provide clear policy implications.

Despite these hurdles to research utilization, as Weiss (1977, 1979) argues, social science research is indeed used. This utilization, however, as emphasized above, may not

always be instrumental or easy to see. Weiss (2009) emphasizes that while research does not always have direct implications, it is also not typically totally ignored. Research "was a source of news. It provided new concepts and ideas. It offered a new angle of vision on old dilemmas" (Weiss, 2009: x.). Weiss (2009) also makes the important point that expectations about research utilization must be realistic. As noted in chapter 1, it is never going to be the case that policing policy and practice are totally determined or controlled by research evidence. Indeed, Weiss (2009) notes that some have changed the call for evidence-based policy to "evidence-influenced policy" or "evidence-informed policy." Still, as Lum (2009) has emphasized, bringing research into the conversation will be an improvement over how much policing policy is currently made. While instrumental research utilization may be rarer than social scientists would like and policing policy totally based on evidence is unrealistic, the use of research in practice can improve police efforts to address crime and enhance fairness.

Factors contributing to research utilization

Studies of research utilization have a long history in disciplines other than criminology. Robin Williams' pioneering work examined research utilization by the U.S. Army during World War II. He stressed that a number of factors play a role in determining whether research will be understood and utilized. Williams (1946, 1953) focused on four important issues in the utilization of research that will all be considered in more detail below. First, the researcher must be aware of the organization's needs and ensure that the research will be useful for the agency. Second, communication between

the researcher and agency is important throughout the process. Ideally, practitioners are involved in the planning and design of the research to increase buy-in at the outset and ensure the final product will be useful. "Action-experience" is a particularly valuable tool. Researchers should take advantage of the experience and knowledge practitioners have in designing and implementing research. This is particularly relevant in policing where frontline officers typically have a wealth of knowledge that can be useful in tailoring interventions to a particular agency or jurisdiction.

Third, research must be translated into clear policy implications for the agency. He noted that "research findings are not utilized to the extent warranted by their intrinsic merit if sole reliance is placed upon dissemination by the printed page…the best immediate results in translating research into action came through repeated contacts with persons in positions of authority and influence. Speaking generally, leaders and administrators simply will not take the time or expend the effort to digest and apply our studies to their problems unless the research sociologist or some intermediary helps them do it" (Williams, 1946: 577). In other words, Williams recognized early that research use was not automatic. Research must be explained and translated to leaders and administrators in order for utilization to occur. Williams (1946) stressed the importance of easy to read summaries with non-technical language as one way to make the military notice research findings. As Williams (1953: 79) describes, "Messages cannot be understood unless they are couched in terms intelligible to the audience, and intelligibility can be greatly heightened if the researcher, or his translator, merely does so much as to acquire familiarity with the needs, problems, and idiom of his intended

audience." Fourth, once an agency decides to act on research, further research should be conducted to assess what happens. As Sherman (1998) notes, research and evaluation should be constant. In the military, like in policing, researchers must be prepared to provide research that addresses pressing needs of the organization and that is presented in a way that practitioners can understand.

What factors help determine whether or not research will be utilized? Nutley et al. (2007) point to four factors that have a significant influence on use in practice and their review echoes many of the conclusions of Williams (1946, 1953). The first is the nature of the research. Research must be well-done and rigorous, but practitioners also are concerned with research being done in a timely manner and presented in a way they can actually comprehend and apply. As Nutley et al. (2007: 71) point out, "presentation is key: research must be attractive, 'user-friendly' and visually appealing, concise and jargon free." In other words, as emphasized above by Williams (1953), research must be presented in ways that make it easily accessible to practitioners.

One focus of this dissertation has been to try to begin to address an issue Innes and Everett (2008) raise about the differing vocabularies and viewpoints of researchers and practitioners (see also Steinheider et al., 2012). As they note, "When researchers talk about how something works, they are referring to the precise details of a causal explanation. When practitioners talk about how something works, they mean how can they actually *do* what a causal explanation implies should be the results of their action" (Innes & Everett, 2008: 50). In other words, police and other criminal justice practitioners want to know more than "what works?" They also want to know how to

implement and adopt what works. This was one of the major goals of chapter 2, and to some extent chapter 3. How can we draw lessons for police on what they should be doing and how they should be implementing these effective approaches? These chapters are a first step, but the problem is that research, even well-done, rigorous research, does not always have clear implications for police policy and practice (see Sparrow, 2011). Of course, not every piece of policing research will come with a clear policy recommendation, but researchers should, as much as possible, present the implications of their work in an easy-to-follow way that could be used and adapted by police agencies. Fineberg's (2012) recommendations about how to present public health research are relevant for policing. He stresses the importance of not presenting too many difficult to follow statistics and while he recognizes, "it is true that the plural of anecdote is not evidence" he also argues, "At the same time, do not be afraid of using personal stories to persuade those who need to be persuaded. Do not be afraid to take the good science and package it in a way that is real for people" (Fineberg, 2012: 2).

Engel and Whalen (2010) also emphasize the importance of language in presenting research and new ideas to practitioners. Researchers should avoid language that makes them seem pretentious and superior. Departments are often more receptive to being told how they should do something that being told what they should be doing. Chiefs are also especially sensitive about the word "reform," because it implies the current situation involves some sort of wrongdoing by the department. Agencies are more receptive to "refinement" than "reform." Engel and Whalen (2010: 109) argue that these language and presentation issues are not insignificant: "Too often, the real value of

material presented by academia is lost when the tone with which it is presented is received as being either condescending, confusing, or a total reversal of what the police department is currently doing."

Researchers also must be ready to answer questions from practitioners, who often express skepticism about the results of policing studies. This was an important part of the Sacramento hot spots experiment, described in chapter 4. Officers were convinced the experiment would lead to spatial displacement of crime, decreased overall officer proactivity, and increased response times to 911 calls. Analyses in chapter 4 were also presented to commanders and officers in the department to make clear that these concerns were not realized in practice. Another frequent question from officers is how will they find the time to implement new strategies and approaches? They often complain that they do not have the time to utilize research in practice, because of their need to respond to 911 emergency calls and deal with their other duties and responsibilities. In Sacramento, we found that officers could successfully implement the treatment and still respond to their calls for service without any increase in response time. Indeed, studies typically show that patrol officers have a significant portion of their shift that is uncommitted and not spent on calls for service or directed activities (see Famega, 2005; Famega, Frank, & Mazerolle, 2005). Policing, like nursing, also has a "culture of busyness" (Thompson et al., 2008) in which officers may report being too busy to understand and utilize research in part because of a lack of agency support and an organizational culture that emphasizes at least appearing to be always busy. Actual time, then, is not typically a real restraint on officers being more evidence-based, but officers

are understandably protective of the free time they currently enjoy. Thus, strategies should utilize this officer downtime, but research must be presented in ways that stress to officers that not all of their time will be controlled by supervisors and outsiders. One packaging technique for policing research is to emphasize that in the long-run, an evidence-based approach will ideally make an officer's job easier, by reducing the number of repeat problem places and offenders.

Dissemination strategies can take a number of different forms, but the overall idea is to package research in ways that will be more accessible. As Nutley et al. (2007) note, dissemination strategies are important for increasing awareness, but usually are not enough on their own to ensure utilization. Still, they are an important first step in exposing practitioners and policymakers to evidence-based approaches. The Center for Evidence-Based Crime Policy (CEBCP) has stressed dissemination throughout its five-year history and the Center's website[47] is full of projects to translate and provide policing research to practitioners. These efforts include the Evidence-Based Policing Matrix, one page briefs of research studies, a video library full of presentations from policing scholars and practitioners, and frequent symposia that in the past have included two workshops designed to promote evidence-based policing in the field. CEBCP is currently working on a new page, entitled "What Works in Policing?" that will use materials from chapter 2 and chapter 3 to provide more detailed information to practitioners on what is and is not effective in policing and resources and recommendations on how agencies can best implement evidence-based approaches.

[47] See http://www.cebcp.org

Nutley and colleagues (2007) emphasize that tailored dissemination efforts are also important. Frontline officers, for example, need to receive information about research in different ways than administrators (see Chagnon et al., 2010). While management and administrators can use research to set overall agency policies and strategies, patrol officers need to understand how to apply research to implement these strategies and utilize science in particular calls and incidents. The License Plate Recognition (LPR) web portal[48] on the CEBCP website was designed with customized dissemination in mind. The web portal has separate pages for police leadership, officers and supervisors, crime analysts, and the community to discuss LPR research and tailored recommendations on using license plate readers in the field. Landry, Amara, and Lamari (2001) also focus on the need to customize efforts to increase utilization, although they recognize this comes with some costs. As they note "as the activities and tasks organized by researchers to insure the utilization of their research results become more idiosyncratic, that is, require high levels of professional skills, specialized know-how, and customization, the specificity of the knowledge transferred increases and the number of potential users decreases (Landry et al., 2001: 414; see also, Amara, Ouimet, & Landry, 2004). In other words, the most effective tailored dissemination approach would be so focused and intensive that it would only be valuable to a few users. Thus, researchers must balance their dissemination efforts, attempting to respond to different

[48] The LPR web portal was designed by Cynthia Lum, Christopher Koper, Linda Merola, Julie Hibdon, and Breanne Cave as part of a multisite randomized trial of the effectiveness of LPR readers. See the portal at http://cebcp.org/lpr/.

parts of the police hierarchy differently, but also trying to create methods that can be applied across agency contexts.

Efforts surrounding "translational criminology" have also increasingly become an important part of disseminating research into the field. CEBCP calls its magazine, which began publication in summer 2011, *Translational Criminology* to emphasize the efforts of the Center to better link scientists with practitioners and policymakers. John Laub, former Director of the National Institute of Justice, focused on the federal government's role in translational criminology during his tenure. The theme of the 2011 NIJ Conference was "Translational Criminology: Shaping Policy and Practice with Research" and Laub (2011) notes that translational criminology is focused not only on bringing research into practice, but also systematically studying how dissemination occurs and what techniques and strategies are effective (or ineffective). This type of research is important in increasing research utilization in policing and across the criminal justice system, but such studies are still in their infancy.

Policing would benefit from a continued sustained focus on translation at the federal level. In health and medicine, for example, there has been a much greater focus on funding translational efforts. The National Institutes of Health has a new National Center for Advancing Translational Sciences[49] established in 2011 to promote the use of innovative ways to more efficiently bring medical research into practice. President Obama's fiscal year 2013 budget request for the agency was over $639 million,[50] suggesting a major investment in translational efforts in the medical field. The Centers

[49] See http://www.ncats.nih.gov/
[50] See http://www.ncats.nih.gov/about/budget/budget.html

for Disease Control's Division of Violence Prevention has developed the Interactive Systems Framework for Dissemination and Implementation[51] with three interconnected systems to help ensure that public health research on violence prevention is used in the field. The Prevention Synthesis and Translation System focuses on translating and distilling research into easy-to-use forms for practitioners, the Prevention Support System works on technical assistance and capacity building for organizations to prepare agencies to be more evidence-based, and the Prevention Delivery System focuses more explicitly on support for implementation. These sorts of sustained efforts would be beneficial in the Office of Justice Programs and other state and federal justice agencies. Police would also benefit from a focus on how-to guides on implementing evidence-based approaches. Certain components of evidence-based approaches are well-covered in existing guides (e.g. see Clarke & Eck, 2005; Taylor & Boba, 2011), although more detailed and extensive information on implementing evidence-based approaches for police would be useful (e.g. see Houser & Oman, 2011 for a implementation guide on evidence-based medicine).

Second, Nutley et al. (2007) note that personal characteristics of researchers and users also do play some role in research utilization, although perhaps not as much as commonly thought. Better-educated practitioners and those with more experience in research tend to use it more, although the research in this area is not conclusive. This echoes the findings of chapter 5, where the evidence on whether education affected receptivity to research was mixed with stronger evidence suggesting more highly

[51] See http://www.cdc.gov/ViolencePrevention/pdf/ASAP_Issue-a.pdf

educated officers valued higher education, but less evidence that higher education was strongly linked to other components of receptivity to research.

Third, researchers need to interact with practitioners on a regular basis for research to influence practice, an issue also stressed by Williams (1946). As Nutley and colleagues (2007: 74) note, "Ongoing interaction and dialogue, two-way communication and sustained efforts towards dissemination significantly increase the chances that research will be used." Police-researcher partnerships are not easy and require dedication, efforts to build trust, and a lot of time from both sides (Engel & Whalen, 2010) but these sustained efforts to collaborate closely on research endeavors are the best way to ensure research findings will be utilized.

Bradley and Nixon (2009) note that these partnerships have not always been successful, in part because of what they call "the dialogue of the deaf," the mutual misunderstanding that often takes place between police and practitioners. They argue policing research has largely ignored the importance of context (see below) in favor of a focus on scientific validity, and that diffusion and utilization have often failed in part because of the lack of long-term police-academic partnerships. They argue for a different approach to partnerships that, "values and respects practitioner knowledge and judgment. It recognizes that practitioners, through engagement with their everyday world, learn solutions to the problems they face, and build up tacit knowledge based on deep learning involving many cases. If evidence-based research is to help improve practices, the nature of those practices must be understood from the point of view of practitioners themselves" (Bradley & Nixon, 2009: 432). In other words, researchers must appreciate all different

kinds of knowledge for partnerships to be effective. This again echoes the work of Williams (1946) and his call for researchers to value and take advantage of the valuable real-world experience of practitioners. Bradley and Nixon (2009) describe a funding model in Australia that helps to promote productive police-researcher partnerships. The Australian Research Council matches any funds the department donates to help the agency undertake research projects jointly developed with academics. These projects all focus on practical questions of value to police agencies. The main problem is a competitive funding system with limited funds that makes it difficult for all interested agencies to participate.

In the U.S., the Smart Policing Initiative,[52] funded by the Bureau of Justice Assistance, is similarly designed to link police agencies and researchers to evaluate evidence-based responses to chronic crime problems. To date, more than 30 agencies have received over $11 million in funding, and a number of these initiatives have been quite successful in both addressing crime problems and enhancing police-researcher partnerships (e.g. see Braga, Hureau, & Papachristos, 2012; Ratcliffe et al., 2012). What will be important to assess is whether these partnerships remain strong, even if funding is eliminated or reduced.

As described in chapter 5, one important way to increase both communication and research utilization is to ensure officers are involved throughout the research process. The earlier the involvement of practitioners in the research process, the more likely there will be officer buy-in and ideally officer use of knowledge gained from the intervention.

[52] See http://www.smartpolicinginitiative.com/

This type of involvement, of course, is most relevant when a research study is being undertaken in an agency, although, as noted above, close collaboration with practitioners and researchers is more generally beneficial in exposing officers to research. Palinkas and Soydan (2012) lament that practitioners are not always involved in crafting the research questions and designing research projects in social work, and the same can be true in policing. As Stephens (2010: 153) argues, "a substantial part of the ongoing tension between police and academics could be reduced if there was agreement on research priorities and then collaboration on obtaining the funding to pursue them." Without this involvement, research questions (and thus, research results) may not be relevant to frontline policing work.

Innes and Everett (2008) echo these comments in their call for not just better communication but better collaboration between researchers and practitioners. This collaboration requires academics to appreciate the value of practitioner experiences and necessitates practitioners recognizing the value of good social science research. Innes and Everett (2008: 56) concede this process is not easy because of different languages and cultures in policing and academia but, "the solution lies in the acceptance by both the research and practitioner communities of the hard work involved in sharing the control and responsibility of the entire process of building new knowledge in the service of the public good."

Kennedy's (2011) description of the Boston Gun Project (Braga et al., 2001) makes clear the benefits of early practitioner involvement not only in terms of increasing buy-in, but also for better informing the intervention and evaluation. Researchers came

into the Boston Police Department having a specific idea about what contributed to juvenile violence, but they chose to meet extensively with officers in the gang unit and representatives from a number of local, state, and federal agencies before designing a violence reduction project. This initial close collaboration with a number of agencies helped create a strong Boston Gun Project Working Group that contributed to the success of the program. Perhaps more importantly, the views of practitioners about what was causing gun violence (a small group of gang-involved offenders who were often victims and offenders) turned out to be correct. Kennedy (2011: 35) discussed his initial skepticism because the researchers had initially planned to focus on guns and gun markets: "I, at least, didn't think they could be right. Everything I'd learned about the diffusion of guns, decoupling, gangs, drug markets, fear, said otherwise. I was, it would turn out, exactly wrong." This raises an important issue discussed in chapter 5; officers tend to value their personal experience more than scientific research in guiding day-to-day decision making. Thus, any effort to incorporate this experience into research projects should make utilization more likely.

Chapter 4 also provided an example of practitioners being involved in the development of a project from the outset. The Sacramento Police Department worked with Cynthia Lum, Chris Koper, David Weisburd, and others at the Center for Evidence-Based Crime Policy to develop an intervention and response that would address an issue of relevance to the Sacramento Police Department. We discuss some of the challenges in increasing utilization of the findings from chapter 4 in the Sacramento Police Department

below. The Society of Evidence Based Policing[53] in the United Kingdom has also focused on increasing practitioner involvement in policing research projects. The Society held its third conference in February 2013, with over 200 participants, many police officers, from around the United Kingdom. Importantly, as Neyroud (2013) notes, many of the presentations highlighted police-researcher partnerships where police had played a leadership role in carrying out rigorous research studies in their agencies, and these studies were designed to answer questions of critical importance for police.[54]

Palinkas and Soydan (2012) also recommend the use of community-based participatory research,[55] a strategy from the field of public health that has relevance for policing. Community-based participatory research focuses on sustaining partnerships between researchers and community groups in order to improve health outcomes. The model though is relevant for efforts to involve police practitioners in research projects. As Israel and colleagues (1998: 178-179) describe, "Community-based participatory research involve a collaborative partnership in which all parties participate as equal members and share control over all phases of the research process, e.g. problem definition, data collection, interpretation of results, and application of the results to address community concerns." Israel et al. (1998) point to a number of rationales for this model, many of which are relevant for involving police in research projects to a greater extent. For example, community-based research helps make research more relevant and useful to all partners, it takes advantage of local knowledge and local theory to improve

[53] See http://www.sebp.police.uk/
[54] See the conference agenda at: http://www.sebp.police.uk/news/past-events/
[55] See http://depts.washington.edu/ccph/commbas.html for more information.

research quality and validity, it joins together diverse groups and combines their experiences and knowledge to improve the project, and can help address cultural gaps between researchers and their partners.

Finally, Nutley and colleagues (2007) argue the context for the use of research is very important (see Tseng, 2012). Research is most likely to be used research when the findings align well with the agency environment and with the interests of frontline workers and management. There can also be cultural resistance to letting research guide policy and practice in the agency. This has traditionally been a barrier to research utilization in policing, although as Weisburd and Neyroud (2011) argue, the historical insularity of the police has dissipated greatly in recent decades as many agencies have become far more open to research and innovation. Sherman (forthcoming) similarly argues that police have become better at being evidence-based, noting "Just as doctors have become increasingly sophisticated in their use of statistical evidence, police will have to do the same to get better results from what they do. And since 1975, that is just what they have been doing. Slowly, but surely, with increasing speed in recent years, policing is becoming both data-driven and more skilled, at least at the level of organizational practices."

There still exists some level of cultural resistance to research in policing, as we saw in chapter 5. A continual problem has been a dearth of sustained partnerships between police and researchers. As noted above, these partnerships offer an important means for research dissemination and increased utilization, but only if these partnerships remain over time. As Weisburd and Neyroud (2011: 9) point out, many of these

partnerships end as soon as a federal grant period is over. "Simply put, the partnerships did not establish themselves as critical enough to the policing mission for the police to take on the partnerships on their own. As such they were arguably nice to have but could be done without." In other words, while the policing culture has increasingly become more open to research, science has yet to become viewed as essential in most agencies.

Shepherd (2001, 2003) and Weisburd & Neyroud (2011) suggest the teaching hospital model should be applied to policing as one way to create a culture in policing that has a greater appreciation for science. This model in medicine ensures that medical researchers and medical practitioners are taught in the same environments and both researchers and practitioners have an appreciation and understanding of each other's work. Of course, the model will not apply directly to policing, most prominently because it seems unlikely most researchers will go through the police academy or that most practitioners will get a Ph.D. Still, efforts to increase the amount of science exposure and education in police training would be useful to increasing receptivity. In addition, the more time researchers spend inside police agencies and training facilities, the easier it will be to sustain long-lasting police-academic partnerships. Kennedy (2010: 168) also argues strongly about the benefits of looking to medicine to improve policing research and practice: "We do not have academic medical researchers who have never met a doctor or a patient, or clinical medical practitioners who think academic researchers are peculiar, useless, and often offensive. It is a marker of a real profession, in fact, that it deliberately integrates pure research, applied research, clinical practice, and the education and socialization of new scholars and practitioners. The teaching hospital, an institutional

invention that I think holds many lessons for us on these points, was crafted to do exactly this."

Leadership within the police agency is crucial for both altering agency culture and increasing research utilization. While police leaders are often limited in their ability to bring about dramatic change in the organization (see Mastrofski, 2002), they can be successful in working to instill a culture more supportive of research and evidence-based policing. As noted in chapter 5, officers are learning primarily about research from their own agency, and so the chief and other top agency management can impact the volume and quality of research information provided to officers. Strong leadership is also important for any innovation to be implemented successfully. Weisburd (2005), for example, emphasizes the importance of strong leadership in both Minneapolis (Sherman & Weisburd, 1995) and Jersey City (Weisburd & Green, 1995) that ensured, despite resistance from line officers, that the hot spots interventions were instituted with fidelity.

Crank and colleagues (2012) advocate for mission-based policing, in which superiors and top leadership in the department provide strong guidance to street-level officers on how to accomplish the main agency mission, which they argue should be a focus on serious crime. Under this model, research is utilized in practice because supervisors are knowledgeable about research and direct officers to use it to tackle crime problems. Crank et al. (2012) argue that the paramilitary structure of most police agencies allows for supervisors to have a major influence on officer activities. They view greater controls on discretion as beneficial if these controls focus on evidence-based approaches to crime reduction. They argue research has traditionally celebrated street-

level discretion, even though this frontline discretion has not typically translated into patrol officers focusing on evidence-based tactics. "For too long, researchers have taken the position that those individuals most recent to the position somehow know the most about how to do it 'on the street' or are somehow smarter about the real world than the more senior officers with extensive career experience" (Crank et al., 2012: xviii).

Not only leadership from the top of the agency is important, but also enthusiasts and champions (see Rogers, 2003) at all levels are important for research to be utilized. Toch, Douglas, and Galvin (1975) describe a model used in Oakland to roll out a department-wide approach to reducing use of force. They started by developing a program with a small group of officers who were well-respected by their peers and thus could help legitimate the program. Also following from the research cited above, these officers were involved in developing the program from the outset, and their street-level experience was valued in designing a training program that this first group of officers could deliver to others in the department. These initial "agents of change" were important in building a basis for reform in the department.

In the fall 2012 issue of *Translational Criminology*, Sgt. Renée Mitchell (2012) describes the challenges of implementing hot spots policing in the Sacramento Police Department (see chapter 4) and points to a need for more champions from both the top and throughout the organization (see Glisson, 2002; Glisson & Schoenwald, 2005). She served as a major advocate and an enthusiast for evidence-based practices, but as a sergeant and as the leader of the crime analysis unit, she also needed support from higher-ranking officers and other units with higher status in the department. As she argues, "the

project team should have the expertise from crime analysis, but also be chosen based on how much personal influence they exert within the organization and their leadership in actively marketing both the idea of research and evaluation, as well as the crime control benefits of effective approaches" (Mitchell, 2012: 11).

These champions for change do not only have to only be internal to the agency. As Nutley et al. (2007: 63) point out, intermediaries (Caplan, 1977) or knowledge brokers can "mediate between research providers and research users by filtering and disseminating the findings from research. They effectively construct a bridge between the research and policy communities." These brokers can be government agencies, professional organizations, technical assistance providers, consultants, or even researchers (see Tseng, 2012). Police leaders are also likely to talk to their peers in similar agencies to learn more about research. Indeed, as Nutley et al. (2007) note, these personal contacts and social networks can be the most important way research knowledge is transmitted and diffused. This suggests that researchers should focus dissemination efforts on a number of different sources, targeting different levels of the agency, but also working with other groups that the agency of interest has close contact with. This also means that successes in achieving research utilization in one agency will likely have beneficial spillover effects. Word can travel quickly in policing. For example, a number of agencies have expressed interest in conducting department-led hot spots experiments after learning about the successful results in Sacramento.

Additionally, agency support for evidence-based policing must be backed up by changes in the organizational reward structure (Mastrofski & Willis, 2010). Officers are

unlikely to shift to evidence-based practices like problem solving in crime hot spots, if they continue to be rewarded based largely on traditional measures like arrests, crime clearance, and rapid response to calls (Alpert & Moore, 1993). Patrol officers must be rewarded for the use of evidence-based practices. If the number of visits to hot spots during a shift became a key performance indicator for police, then it is very likely that officers would quickly move to adopt hot spots policing. Another example would be altering sergeant's exams so that understanding how to apply research evidence in practice became an important part of the promotions process. Officers thus would be more motivated to be evidence-based in order to advance in the ranks (Lum, 2009). Neyroud (2011) points out that unfortunately most police agencies are not rewarding evidence-based practice. As he notes, "Currently few incentives are out there to innovate in policing and to engage research in the development of practice" (Neyroud, 2011: 81).

The evidence overall on the benefits of providing rewards and reinforcement to increase evidence-based practices is limited, but somewhat mixed (Nutley et al., 2007). It does seem unlikely though that officers will shift behaviors if their performance on these new behaviors goes unnoticed and unrewarded. Incentives to use research in policing can also be financial. Solicitations for policing research from the Bureau of Justice Assistance (a key knowledge broker for police agencies) now explicitly mention the Evidence-Based Policing Matrix as a tool agencies should consult when developing evidence-based strategies.[56] Awards and recognition are another incentive that could

[56] See, for example, the most recent solicitation for the Smart Policing Initiative: https://www.bja.gov/Funding/13SmartPolicingSol.pdf

help promote research utilization. The Evidence-Based Policing Hall of Fame[57] in the CEBCP, for example, is designed to celebrate the achievements of officers or civilians who have shown a dedication to evaluating police tactics and promoting evidence-based policing in their agencies. The IACP rewards outstanding police-led research studies with the Excellence in Law Enforcement Research Award[58] and special recognition at the annual IACP conference.

Models for increasing research utilization

These efforts to increase research utilization can be incorporated into the three main models for improving research use in practice discussed by Nutley and colleagues (2007). These models are all relevant to consider in policing and some combination may be most effective in maximizing research utilization. In the research-based practitioner model, individual practitioners bear much of the responsibility for understanding and using research. This model echoes some of Weisburd and Neyroud's (2011) call for police to take greater ownership of science (see below), although as Weisburd and Neyroud (2011) concede, without greater training and higher educational standards, it seems unlikely that police officers can be expected to all be responsible for understanding and applying research. Still, efforts to better train officers on evidence-based policing discussed in chapter 5 are one important step in increasing both receptivity and research use.

[57] See http://cebcp.org/evidence-based-policing-hall-of-fame/
[58] See http://www.theiacp.org/About/Awards/IACPExcellenceinLawEnforcementResearchAward/tabid/276/Default.aspx

In the embedded research model, research is implanted into systems and processes throughout the organization, be it official policies and procedures, or tools the agency uses. The Matrix Demonstration Project, discussed in chapter 5, is largely based around the embedded research model. The Matrix Demonstration Project is designed to help provide tools that can be used to institutionalize evidence-based policing in practice. Many of these tools refine existing police products in an effort to embed research into day-to-day work. In the Richmond Police Department, for example, a "case of places"[59] approach is transforming detective work by focusing investigators on high-crime places instead of just on persons, to better incorporate research findings that place-based interventions are often more effective than person-based efforts (Lum et al., 2011). Importantly though, the case folders for places mirror the person-based folders traditionally used, as a way to embed research into an already established standard procedure in the agency. In the Alexandria, Virginia Police Department, efforts are underway to revise field training procedures to better incorporate research findings.[60] For example, instead of only grading new officers on their ability to navigate their beat and the jurisdiction's streets, an evidence-based field training approach emphasizes requiring officers to know the location of hot spots in their service area and be familiar with approaches they can use to address these crime concentrations.

Finally, in the organizational excellence model, the agency's structure and processes emphasize the importance of research and achieving excellence through

[59] See http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/case-of-places/
[60] See http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/transforming-field-training/

evidence-based strategies. This again brings to mind Weisburd and Neyroud's (2011) call for greater leadership from police agencies in making scientific research a key driver of policies and practices. The organizational excellence model requires strong leadership, as a well as a "research-minded organizational culture" (Nutley et al., 2007: 204). Partnerships with academics can be especially important in developing this culture.

All of these models are important to consider in efforts to increase research utilization. The research-based practitioner model is likely unrealistic for policing and perhaps a more appropriate model for medicine, but this model suggests the importance of having particular scientific evidence specialists in the department who are very familiar with research. Some agencies may have the benefit of a well-informed practitioner, who serves as a valuable resource for the agency both as an informant for other officers on what the research shows and as a change agent promoting an agency culture more receptive to evidence-based policing.

Projects like the Matrix Demonstration Project are also important because of the focus on the institutionalization of research in practice. As noted above, many innovative practices are quickly discarded after the end of a grant cycle, but if research evidence can be embedded and institutionalized into standard procedures, processes, and practices, then ideally even initially resistant officers will eventually become more evidence-based, even if only to follow policies and procedures (see also Lum et al., 2012). The paramilitary hierarchy in policing has its advantages here in terms of forcing lower-ranking officers to listen (at least to some extent) to the directives of top administrators (see Crank et al., 2012; Weisburd, 2005). Thus, efforts from chiefs and other top

administrators to not only embed research into certain departmental practices, but also to overall be more focused on rigorous evaluation and evidence-based approaches will have important implications for the agency's progress in moving forward with evidence-based policing. The organizational excellence model is a challenging standard for many current police agencies (and service agencies more generally; see Nutley, Walter, & Davies, 2009). Still, this model of agencies collaborating closely with research partners to consistently use scientific evidence to guide policy and practice is a standard worth striving for.

Research utilization and diffusion of innovation

The process of research utilization is also closely linked to the diffusion of innovation process (Rogers, 2003). Increasing research utilization in policing largely refers to agencies adopted evidence-based innovations. Greenhalgh and colleagues (2004) find a number of characteristics are associated with innovation diffusion in service organizations. As expected, the factors identified by Rogers (2003) have a significant impact on diffusion. Thus, innovations that have a relative advantage or improve existing approaches, that are compatible and consistent with departmental norms and values, that are not complex or difficult to adopt, that allow for trialability or testing in a small area or part of the department, and that have results that are easily observable are more likely to be diffused and adopted. The diffusion literature helps explain why hot spots policing has been adopted in a number of larger agencies (Reaves, 2010; Weisburd & Lum, 2005). Hot spots policing represents an improvement in terms of crime control effectiveness

over random patrol; hot spots policing is still focused on enforcement and police presence which fit in well with departmental norms; at its simplest, it involves just adding police presence to high crime areas, which is low in complexity; it can easily be piloted or tested in a few areas or district in the city, as was done in Sacramento in chapter 4; and the improvements in crime control can be easily measured using existing departmental data collection mechanisms.

Greenhalgh et al. (2004) also identified additional relevant factors that affect diffusion and adoption, many of which were discussed above. For example, innovations that are easier for an agency to reinvent or modify and adapt to their local context are more readily adopted. Adapting the innovation to the local context also made institutionalization and long-term commitment to change more likely. Agencies understandably tend to be risk-aversive. The riskier an innovation, the less likely it will be adopted. The advantage of an evidence-based model is that innovations become less risky to try as the body of scientific support increases in size. Agencies are also more open-minded about innovations where the knowledge required can more easily be transferred across contexts. This is also relevant to policing, where, for example, an investment in crime analysis and improved data systems would benefit not only hot spots policing, but also the adoption of any evidence-based approach. As noted above, organizations also tend to be affected and influenced by their peers. Agencies are more likely to adopt an innovation when similar organizations start to use it. Formal or financial incentives to innovate can be effective, although as noted earlier the evidence here is limited, and any financial incentive to make agencies more innovative can be

expensive. Leadership must be supportive of change and top and middle management's goals must align well with the innovation. Line-level practitioners also must be motivated and have the skills and training necessary to implement the innovation in day-to-day work.

Overall, our discussion of research utilization makes clear that utilization is complicated and becoming more evidence-based is a multi-step process for both officers and agencies. Gibbs (2003) describes a seven-step process for evidence-based practice to become a reality in the helping professions. These seven steps line up well with what the Sacramento Police Department had to do to prepare for and implement the hot spots experiment (see chapter 4). First, there must be motivation to apply evidence-based practices at both the agency and individual officer level. Then information from research has to be converted to an answerable question for the agency. In other words, practitioners have to figure out what processes or practices can best be addressed by research evidence. In the case of Sacramento, research on hot spots policing and Koper's (1995) research in particular proved useful in designing a research question. All available evidence then has to be gathered and appraised to determine the best path of action. Ideally, researchers and targeted dissemination strategies can help practitioners with the research distillation process. Agencies then must try to develop approaches, often with the help of researchers, that effectively combine research evidence and practitioner experience. The results of these new practices and procedures should then be evaluated and a constant feedback cycle should ensure that agency practices and policies are having the intended effects (Sherman, 1998). Finally, leaders and change champions

in the agency will have to inspire others to be more evidence-based and help institutionalize evidence-based policing in the department. These efforts to implement evidence-based approaches are resource-intensive at the outset, particularly in terms of dedication, coaching, and time from leaders; skills training for officers; and strong data and analysis systems (see Fixsen et al., 2009), but in the long-run, the evidence-based model is designed to ensure that limited resources are used as efficiently and effectively as possible.

Before turning to future research, we emphasize that while policing can learn lessons from other fields such as medicine in efforts to increase research utilization, bringing research into practice is a challenge in any field. McGlynn and colleagues (2033) surveyed adults about the medical treatment they received and examined their medical charts to determine if they received appropriate care for a number of conditions. Overall, patients received only 54.9 percent of the care and treatment recommended by research. Adherence to quality indicators did not exceed 80 percent for any of the 25 conditions examined, and for alcohol dependence, patients received just 10.5 percent of recommended care. Even in a field where evidence-based practice is far more established, ensuring that practice accurately reflects the latest scientific evidence remains a major challenge.

Future Research

The previous chapters suggest a number of avenues for future research on evidence-based policing. In chapter 2, we focused on the need for rigorous policing research in other contexts, as much of the existing evidence base focuses on large urban areas (see Cave et al., in progress). With the exception of D.A.R.E. programs (e.g. Rosenbaum et al., 1994), we also have limited evidence on the long-term outcomes of many policing programs, in part because grant funding cycles usually preclude follow-up periods of longer than a year. Future research should apply the individual-level longitudinal study framework (see Thornberry & Krohn, 2003) to the many effective place-based policing interventions. We also emphasized the need for better data on what agencies and officers are actually doing in the field, an issue discussed more below.

In chapter, 3, we argued for a balance between research generation and research synthesis. While systematic reviews have been an important way of synthesizing knowledge about what works (and what does not work) in policing, nearly every review concludes by lamenting the lack of available rigorous studies and calling for more primary research. As noted in chapter 1, the evidence base of rigorous policing studies continues to expand, and each year, a number of studies are added to the Evidence-Based Policing Matrix. Still, further research is needed in many areas, particularly those we identified in chapter 2 as having insufficient evidence (or evidence that is too mixed) to provide firm recommendations to police.

In chapter 4, we noted the fact that a lack of funding made it impossible to examine systematically what officers were doing in Sacramento while present in the hot

spots and the need to better understand the effectiveness of particular officer strategies and tactics in hot spots, an issue we discuss more below. We also suggested models for future hot spots experiments. For example, a more ideal design for future studies would be to have three conditions instead of the two in the Sacramento experiment: a control group that receives standard policing, a treatment group that receives a treatment similar to the current study, and a second treatment group that receives increased police presence similar to the Minneapolis study without direction as to how long officers should spend in hot spots or the order in which they should visit hot spots. This would allow for a rigorous test of the extra benefit of using the 15-minute random stops versus a more standard directed patrol strategy. We discuss other potential variations of the Sacramento design below that could be useful in assessing whether police presence alone is sufficient to reduce crime or if police must be engaged in proactive enforcement in crime hot spots to have an impact.

Finally in chapter 5, we called for continued research on police receptivity as only a small number of studies have considered issues related to officer receptivity to research and evidence-based policing. As we emphasized in the previous section, additional studies of both receptivity and research utilization are needed, and efforts to advance evidence-based policing should make use of research recommendations from other fields on how to ensure that high quality research is being used to guide policy and practice.

We focus here on two areas discussed briefly in previous chapters: the importance of knowing more about what officers and agencies are doing day-to-day and

the need to better understand how evidence-based policing can be achieved in ways that also maximize police legitimacy.

Agency and officer day-to-day activities

We currently have limited data collection on what agencies and in particular what officers are doing day-to-day. LEMAS provides the largest source of data on activities at the agency level. While LEMAS suggests the largest agencies have many of the capabilities and technologies needed for engaging in evidence-based approaches, most smaller agencies still lag behind. For example, while over 90 percent of the largest agencies are using computers for hot spot identification, just 13 percent of departments overall are. Even in moderately sized cities (population 100,000-249,999), just 66 percent of departments use computers to identify hot spots. When it comes to using computers for crime analysis and crime mapping, results are similar. One hundred percent of the largest departments make use of computers for such tasks, but only 38 percent of agencies overall use computers for crime analysis, and 27 percent use computers for crime mapping. LEMAS is limited though in providing data on what departments are actually engaged in day-to-day. Because it is a massive national survey, there are limits to the number of questions that can be asked about daily practices, and even with additional questions, the LEMAS data reflect the survey responses of only certain individuals in the department, who may not always have sufficient knowledge about daily practices to provide reliable data.

Thus, while the data discussed above provide an estimate of the extent to which police agencies have adopted hot spots policing, they do not make clear how frequently agencies are actually using hot spots policing in practice. In other words, while it appears that a substantial proportion of larger agencies are using computers to identify crime hot spots, what percentage of officer time is actually being spent on hot spots policing in these agencies? Data on the level of implementation of hot spots policing is not available at the department level, but such data would be important to better understand to what extent hot spots policing is becoming a primary tactic in police agencies.

Additionally, LEMAS questions on agency practices have focused to date on a small number of police innovations, primarily community policing, problem-oriented policing, and hot spots policing. We know far less about the adoption of other strategies reviewed in chapters 2 and 3 that have shown evidence of effectiveness, including focused deterrence strategies to target gang and drug crime and using directed patrol to address gun violence. LEMAS also only surveys a stratified sample of agencies with less than 100 sworn officers, suggesting a further limit on our knowledge of practices and tactics in smaller police departments. Additionally, LEMAS is also only administered every three to four years, and data are not released quickly. For the 2007 survey administration, the Bureau of Justice Statistics did not release a results publication until December 2010 and data were not released to the Inter-university Consortium for Political and Social Research (ICPSR) until July 2011 (Department of Justice, 2011). As

of April 2013, our primary national source of data on police agency practices is more than four years out of date.[61]

LEMAS is not the only national-level survey of police agencies, but it remains the only current data collection tool with a number of questions on officers' strategies and tactics. Wilson and Heinonen (2011) raise additional issues about agency-level surveys in their analysis of data from a RAND Corporation survey on police personnel. While this survey did not focus on officer tactics and strategies, the finding that a number of agencies were unable to provide complete data on staffing and personnel issues is relevant to consider. About three-fourths of large agencies responded to the survey, but more than 10 percent had difficulty filling it out completely. If agencies have some difficulty with accurately reporting issues such as staff attrition and number of personnel, it seems likely that recall issues will be more prominent in questions about strategies and tactics.

One opportunity to learn more about the inner workings of police agencies comes from the National Police Research Platform,[62] a long-term project designed to collect data about agencies and officers in a number of departments across a number of different topic areas (see Rosenbaum, 2010). Mastrofski and Rosenbaum (2011), for example, provide preliminary data on surveys in two agencies to assess officer beliefs about the receptivity of their organization to innovation. They found variability across the agencies in officer beliefs about whether management was supportive of change in the organization, suggesting, as we argued in chapter 5, the need to examine agency context

[61] Data collection for the 2007 LEMAS survey took place between December 2007 and December 2008.
[62] See more on the National Police Research Platform at http://www.nationalpoliceresearch.org/.

to understand officer receptivity. These types of large-scale standardized surveys could be useful in gathering more data on what officers are doing in the field day-to-day and whether evidence-based approaches are successfully being implemented, although to date only limited data has been released from Platform surveys.

While budget cuts across the federal government make a further expansion of large-scale data collection efforts on police agencies unlikely, there are still ways researchers can learn more about if and how agencies are adopting evidence-based approaches. Veigas and Lum (in progress), for example, describe how the Derbyshire Constabulary mapped the 22 primary strategies in their patrol portfolio into the Evidence-Based Policing Matrix (Lum et al., 2011) to assess whether these strategies matched both specific effective studies in the Matrix and realms of effectiveness identified through examining the clustering of Matrix studies (e.g. the most effective approaches are place-based, focused, and proactive). The mapping suggested both areas where patrol strategies lined up well with research areas and a number of areas, particularly more reactive, individual-focused approaches, with little evidence of effectiveness in addressing crime. The Center for Evidence-Based Crime Policy is currently working with the Seattle Police Department to assess how the agency's strategies line up with recommendations from research on what police should and should not be doing.[63] These efforts are useful at the department level for assessing what strategies agencies are using, particularly in patrol, and how these approaches line up with research evidence on what works, although again, they provide less data on the day-to-day actions of officers.

[63] See http://gunston.gmu.edu/cebcp/effectivepolicing/index.html to learn more about this ongoing effort.

Qualitative studies such as Willis and colleagues' (2007) assessment of Compstat in three departments can also better provide data on the kinds of strategies police agencies are engaged in and how these interventions are carried out at the street level. Further qualitative or mixed methods approaches would be useful in better assessing the extent to which departments are actually engaging in effective strategies. Palinkas and Soydan (2012) stress the need for mixed methods research as a way to measure both process and outcomes in intervention studies. Although they are writing about evidence-based social work, this model is also useful in policing where rigorous research often suffers from a "black box" problem in which little is known about how the treatment did or did not work (see Rosenbaum, 2010; Weisburd, 2010). These approaches could be used to assess both agencies and officer activity, an issue discussed more below.

There are also multiple ways to gather more data on what officers are actually doing in the field day-to-day and additional research is needed in all of these areas. A number of these approaches are discussed below, including the use of automatic vehicle locators (AVL), officer activity logs, and systematic social observation (SSO).[64]

A recent study in Dallas (Weisburd et al., in progress) was the first randomized experiment to make use of data from automatic vehicle locators. AVL technology tracks the exact location of a patrol car repeatedly. This has obvious benefits for officer safety in terms of monitoring patrol cars, but it also has benefits for assessing where officers are going during their shift. In hot spots policing studies, saturation patrol is often an important component of the intervention, and so AVL technology could allow the

[64] This section draws from Telep's (forthcoming) encyclopedia entry on methodological issues in evaluating police performance.

department to assess how often officers are visiting hot spots and whether treatment is being delivered as intended. While police unions are reluctant to allow departments to closely monitor AVL data, there is potential here to better identify officers' spatial location during their shift. As noted in chapter 4, AVL data was used in the Sacramento experiment as a check on whether officers were physically present in their assigned hot spots during the time they said they were. The Sacramento Police Department is continuing to analyze the AVL data to better understand how levels of saturation patrol affected variation in crime outcomes across the treatment group hot spots. While AVL data provides an advance in terms of measuring police presence, it still provides little data on officer activities.

To fully evaluate performance, police agencies must know not only where officers are, but also what they are doing. While agencies have increasingly moved towards a greater embrace of problem solving and working with the community, there is little or no official departmental data on whether officers are actually engaging with the community or using proactive problem solving (Alpert & Moore, 1993). One option is to better survey officers about their activities while on duty. Most police agencies currently keep track of how long officers spend on particular calls for service, but have much less data on what officers are doing during those calls (unless an incident report is written) or in their uncommitted time. Dadds and Scheide (2000) discuss the use of activity measurement in Australia as a way to better monitor what officers are doing in the field and how these activities may be linked to desired outcomes. Officers spend one or two weeks annually filling out a survey on specifically how they are spending their time on

each shift. This method relies on the veracity of officer responses, and it can be difficult to place officer activities into specific categories. Still, the survey provides an opportunity to estimate how officers' time is divided between traffic services, community police services, crime management, emergency response management and coordination, and criminal justice support. Officer logs of activities used to address high crime hot spots have been used in other studies, including in the Jersey City problem-oriented policing hot spots experiment (see Braga et al., 1999), where officers generated a list of responses used to address violent crime problems in each treatment group hot spot. Lum and Koper are also having officers detail their activities while present in treatment group hot spots in a current experiment in Fairfax County, VA.

Mastrofski (1996) provides five different methods for evaluating what officers are doing in their day-to-day work and in interactions with citizens. The first, as described above, is officer self reports of behavior. While inexpensive, this method suffers from potential problems in reporting validity. The reports of citizen who interact with the police are another possibility and are discussed more below as a measure for assessing police legitimacy. A third possibility is using evaluations by other human service professionals who regularly interact with the police. While such evaluations would be less subjective than self-report data, such professionals would not be present during a large proportion of police work. The last two methods offer the most objective means of assessing police activities: the use of indirect third party observation (e.g. video recording) and the use of direct third party observation. Direct third party observation is discussed below as a means for systematic social observation. The use of police video

recordings has been fairly uncommon to date, although as more departments record officer activities and as technology improves, this would seem to be a promising and inexpensive route for future research on how officers are implementing strategies in the field. Departments are now increasingly using body-mounted video cameras, which allow for greater access to officer activities and actions than more traditional car-mounted cameras (see Farrar, 2013).

Systematic social observation offers an even better way to assess what activities officers are engaged in while in the field. SSO makes use of protocols in field observations of the police to ensure that data collection is standardized within and across observers. As Mastrofski, Parks, and McCluskey (2010: 243-244) note, "it offers enhanced prospects of validity, and in many situations it provides for increased confidence in reliability, because of the researcher's direct access to the phenomenon of interest and greater control and transparency of data encoding. Further, it affords greater precision in capturing details of the phenomenon and its context." SSO is not without potential threats to validity. A primary one is the possibility of observer error in recalling events. While multiple observers of the same scene would be ideal to avoid this, it becomes difficult both in terms of cost and logistics to use more than one observer per officer. Another concern is reactivity effects. Are officers responding differently when observers are watching their actions? Research on this topic is limited, but in a long-term project where officers are being observed repeatedly, it seems less likely that reactivity would be a major problem.

Systematic social observation has been an important component of a small but growing number of research studies on police behavior and should be used in further studies. Famega and colleagues (2005), for example, used systematic social observation in Baltimore to assess both how officer time was allocated and the reason for officer actions over the course of 163 shifts. Their finding that 75 percent of officer time is unassigned suggests that simply examining calls for service data is insufficient for understanding what officers are doing during their shifts. As noted in chapter 4, a lack of funding prevented the use of SSO to observe officer activities in the treatment group hot spots, but this sort of detailed data on officer activities and interactions with citizens and suspects would be useful in future efforts to better assess what hot spots policing looks like in action and what particular officer actions are most effective in terms of reducing crime and disorder.

Evidence-based policing and police legitimacy

A second important area for future research is understanding more about the relationship between the implementation of evidence-based practices and police legitimacy. While much of this dissertation has focused on the crime control effectiveness of the police, the police must simultaneously be fairer and more evidence-based to truly address crime effectively. Better understanding the intersection of fair and effective policing and how to get officers engaged in both is thus an important topic for future research efforts.

The NRC (2004: 2) argued that, "evidence from policing research contradicts any concern that an emphasis on policing that is fair and restrained will necessary undermine their crime control effectiveness, and vice versa, for fairness and effectiveness are not mutually exclusive, but mutually reinforcing." This is a powerful statement, suggesting that there is no reason why evidence-based policing cannot also enhance police legitimacy. As discussed in chapter 2, a number of scholars have suggested that certain intensive police interventions, like hot spots policing, may erode police-community relations and damage resident perceptions of the police (e.g. Kochel, 2011; Rosenbaum, 2006). Chapter 2 noted that there remains little empirical evidence that residents view these interventions negatively (e.g. see Weisburd et al., 2011), but certain segments of the population, particularly young and minority males who are often the target of police attention, may react particularly negatively to intensive police programs (see Gau & Brunson, 2010). We discuss four important areas of future research below related to evidence-based policing and police legitimacy, with a particular focus on hot spots policing.

How does intensive policing affect resident views of the police? Does hot spots policing threaten police legitimacy by decreasing citizen satisfaction with the police? As noted above, research in this area to date has typically found that during intensive police interventions, residents tend to either welcome the added police attention (e.g. Shaw, 1995) or fail to even notice the added attention (e.g. Weisburd et al., 2011), although Hinkle and Weisburd (2008) do find evidence of increased resident fear as a result of an intensive police operation in Jersey City. Still, more research is needed in this area, as

studies have not typically been designed to examine how hot spots policing affects perceptions of the police. A current experiment underway in St. Louis County, MO should help shed new light on this issue. Kochel and Weisburd are specifically examining how both standard directed patrol and problem-oriented hot spots policing affect resident perceptions of the police.[65] Using three waves of survey data, the study will examine whether resident attitudes about the police are affected by the hot spots intervention and whether these views are different from a control condition that continues to receive standard policing.

A second key question for future research is can police be trained to perform hot spots policing in procedurally fair ways that help increase legitimacy? Weisburd and colleagues have proposed a multisite experimental study to test this question. One experimental group of hot spots would be treated by officers receiving training on more standard, enforcement-oriented hot spots policing, while a second experimental group would be treated by officers receiving training on procedural justice and the importance of building legitimacy in hot spots. These groups would both be compared to control hot spots receiving standard policing. The study would examine both crime control outcomes and use door-to-door interviews to assess changes in resident views of the police. Additionally, arrestees in all three groups would be interviewed to examine their perceptions of the police and the treatment they received during their arrest. This would provide new evidence across multiple sites about how different types of hot spots policing affect citizen and offender perceptions of the police and whether a training

[65] Read more about the study at http://news.siu.edu/2011/10/101411amh11196.html.

program designed to increase procedural justice can provide a hot spots policing model that actually increases legitimacy while also reducing crime. Based on Tyler's (1990, 2004) process-based model where increasing legitimacy can lead to increased compliance with the law, a successful legitimacy-based hot spots approach may even lead to greater long-term crime control gains if the program can increase compliance behavior by enhancing police legitimacy. This would also be one of the first studies to examine offender perceptions of the police across varying hot spots conditions. A successful procedural justice-focused hot spots approach could be beneficial in reducing reoffending among arrestees (see Paternoster et al., 1997).

A third important question related to police legitimacy is does hot spots policing need to be enforcement-oriented to be effective? A number of agencies have expressed interest in designing an experiment to examine this question. One treatment group would receive a standard enforcement-oriented hot spots approach where officers are encouraged to make arrests, write citations, and make person and vehicle stops while present in the hot spots. A second treatment group would receive the same levels of increased police presence, but officers would be discouraged from any enforcement activity. Instead, they would be encouraged to just be physically present and to spend time on positive contacts, such as chatting with residents or visiting businesses. These treatment groups would be compared to a control group receiving standard policing. The main question is whether the presence-only hot spots treatment can reduce crime as effectively as the enforcement-oriented group. If so, this suggests hot spots policing can potentially be delivered in ways that are less enforcement-oriented and presumably would

have less potential negative consequences for resident and offender perceptions of the police.

Finally, while much of the research to date on evidence-based policing and police legitimacy has focused on hot spots policing, police fairness likely plays a major role in other effective approaches discussed in chapter 2 and chapter 3. Braga and Weisburd (2012b), for example, note that procedural justice can be a component of focused deterrence interventions in an effort to increase offender buy-in and improve perceptions of the police. The Chicago Project Safe Neighborhoods intervention focused explicitly on treating offenders in procedurally fair ways during call-in meetings to try to increase deterrence (Papachristos, Meares, & Fagan, 2007). Tillyer, Engel, and Lovins (2012: 990) also emphasize the importance of procedural justice as a way to reduce criminal behavior by targeted offenders, noting that "the model aims to improve the legitimacy of law enforcement by making police action commensurate with criminal behavior and consistent across cases, bringing together the community and the police as a united front against violence, and communicating sanction risk to offenders in a stern, yet respectful, tone."

Little research, however, has assessed whether focused deterrence interventions are successfully implemented in a procedurally just manner and whether changes in offender views of the legitimacy of police are in fact a mechanism by which these programs reduce reoffending and crime. Papachristos, Fagan, and Meares (2012) examined pre-intervention surveys of Chicago program participants, finding that offenders generally have very negative views of the police, particularly gang members

who associate largely with other criminals. They also find though that the legitimacy of the law and the police affect compliance with the law for offenders in the same ways they do for non-offenders. Thus, any effort successful in improving offender views of the police could have implications for increasing compliance behavior. Examining if and how these views change over the course of the intervention would be important for better understanding how focused deterrence strategies may be able to use procedural justice as a way to enhance program effectiveness.

Finally, further research on the benefits of evidence-based policing is vitally important. This may seem like a rather surprising recommendation at the end of a dissertation devoted to the benefits of evidence-based policing, but as Nutley and colleagues (2007: 297) point out, "we have noted the irony that any evidence that increases in research use have indeed made the world a better place is at partial and contested, and some would say is largely absent." In other words, there are a number of reasons why evidence-based policing should be beneficial to policing (see Engel & Whalen, 2010; Lum, 2009; Sherman, 1998) in terms of addressing crime more effectively and efficiently, but little research to date has examined how much more effective and efficient a department becomes by being evidence-based. As Sherman (forthcoming) notes, for example, we have no knowledge (experimental or otherwise) on how effective a hot spots strategy at the department or community level would be versus other patrol strategies.

Conclusions

Local police agencies cost about $55.4 billion to operate, for an average cost of $260 per resident and $116,000 per sworn officer, in fiscal year 2007, the latest year for which data are available (Reaves, 2010). This represented a 14 percent increase from 2003 even after adjusting for inflation, so costs in 2013 are likely even higher. Police are a critical resource for maintaining order and public safety, but they are also very expensive. In the current era of decreasing local, state, and federal budgets, it is essential to ensure that the money being spent on policing and all government agencies is being used efficiently and effectively to reduce crime and maximize public safety. Evidence-based policing is a means to use police resources in ways that have the best chance of addressing crime problems. This dissertation has focused on what the research evidence suggests police should (and should not) be doing to best address crime, how agencies can apply the research evidence in practice in ways that can reduce crime without creating extra expenses for the department, and how officer views about research and evaluation can impact moving forward with evidence-based policing. As noted above, future research is needed in a number of areas related to evidence-based policing, but we have learned enough now to give recommendations to the police on strategies to adopt and suggestions on how to implement these approaches to ensure officer buy-in and treatment fidelity. Evidence-based policing has increasingly taken hold in policing in recent decades, but much work remains to be done. If agencies want to continue to enjoy crime control gains with fewer officers and slashed budgets, making use of the research evidence is the best answer in moving forward.

APPENDIX A: LUM AND TELEP POLICE OFFICER RECEPTIVITY SURVEY

1. Have you ever heard of the term "evidence-based policing"?

_____ YES (if yes, answer question 1b below)
_____ NO (if no, skip to question 2 below)

1b. How would you define the term "evidence-based policing"?

2. **In the last six months**, from which of the following journals or magazines have you read an article or feature? (Check all that apply)

_____ a. The Criminologist (magazine for the American Society of Criminology [ASC])
_____ b. Criminology and Public Policy (academic journal of the ASC)
_____ c. Criminology (academic journal of the ASC)
_____ d. The Police Chief (magazine of the International Association of Chiefs of Police)
_____ e. Justice Quarterly (academic journal of the Academy of Criminal Justice Sciences)
_____ f. Police Quarterly (academic journal of the Academy of Criminal Justice Sciences)
_____ g. FBI Law Enforcement Bulletin
_____ h. None of the Above
_____ i. Other:_____

3. **In the last six months**, have you read any formal or written information provided by the following organizations **specifically about the effectiveness of particular tactics or strategies**? (Check all that apply)

_____ a. Your own police agency
_____ b. National Institute of Justice (NIJ)
_____ c. Bureau of Justice Assistance (BJA)
_____ d. Police Executive Research Foundation (PERF)
_____ e. The Police Foundation
_____ f. International Association of Chiefs of Police (IACP)
_____ g. Bureau of Justice Statistics (BJS)
_____ h. Office of Justice Programs (OJP)
_____ i. COPS Office/Center for Problem-Oriented Policing
_____ j. A university (PLEASE NAME: _____)
_____ k. A library database (PLEASE NAME:_____)
_____ l. None of the above
_____ m. Other: _____

4. Below is a list of policing strategies. Indicate next to each strategy whether you think it is very effective, effective, somewhat effective, or not effective **for reducing crime and disorder**. Check the fifth column if you have not heard of the tactic.

	Strategy	**Very Effective**	**Effective**	**Somewhat Effective**	**Not Effective**	**I Have not Heard of this Tactic**
a.	Random preventive Patrol					
b.	Hot spots policing					
c.	Community-oriented policing					
d.	Problem-oriented policing					
e.	Rapid response to 911 calls					
f.	Follow up visits for domestic violence					
g.	"Pulling levers" interventions for violent offenders					
h.	Drug Abuse Resistance Education (DARE)					
i.	Use of civil remedies (e.g., nuisance abatement)					
j.	Restorative Justice					
k.	Mandatory arrest for misdemeanor domestic violence					
l.	Traffic enforcement to reduce gun crime					
m.	Zero tolerance Policing					
n.	Legitimacy Policing					

5. **In the last 12 months or so**, have you attended or participated in any professional policing conferences outside of training within your police department? Please specify the conference if YES.

_____ YES: _____
_____ NO

6. Have you received any formal training about how to identify or evaluate which policing tactics or strategies are effective in reducing crime? Please specify the type of training and from whom if YES.

_____ YES: _____
_____ NO

SECTION B

1. To what extent do you find materials and data produced by crime analysts or researchers working within the department useful?

_____ a. Very useful
_____ b. Somewhat useful
_____ c. Marginally useful
_____ d. Not at all useful
_____ e. I do not know if these individuals exist in my agency.

2. How often do you use materials produced by crime analysts in your daily work?

_____ a. Often
_____ b. Sometimes
_____ c. Rarely
_____ d. Not at all

3. When you decide to respond to a particular crime problem, which **BEST** describes your approach? (Check only **one** answer)

_____ a. I use tactics that have worked for me in the past.
_____ b. I let calls for service and other public requests guide my response
_____ c. I try new tactics that I hear about from my supervisors.
_____ d. I try new tactics that I have learned about from other sources.
NAME SOURCE:_____
_____ e. I try new tactics based on materials/data from crime analysis.

4. To what extent do you find information from research (conducted by universities or research organizations) regarding police tactics useful?

_____ a. Very useful
_____ b. Somewhat useful
_____ c. Marginally useful
_____ d. Not at all useful

5. Some police agencies have hired a full-time criminologist (an academically-trained researcher who is not a sworn officer) to work in their agencies. Does your agency currently employ a full-time criminologist?

_____ a. Yes
_____ b. No
_____ c. Not Sure

6. Regardless of whether your agency currently employs a criminologist, how helpful do you think a criminologist would be in your agency?

_____ a. Very helpful
_____ b. Somewhat helpful
_____ c. Marginally helpful
_____ d. Not at all helpful

SECTION C

1. Indicate your level of agreement to the following statements:

	Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
a. I am willing to try new tactics or strategies, even if they are different from what I am currently doing.				
b. Collaboration with researchers is necessary for a police agency to improve its ability to reduce crime.				
c. When a new idea is presented from top commanders, it is usually a fad, and things will eventually return to normal.				

2. How willing would you be to take the following actions to test whether a particular tactic the police are currently using is effective?

	Very Willing	**Quite Willing**	**Somewhat Willing**	**Not Willing**
a. Stop the tactic to see if the problem gets worse				
b. Stop the tactic in one small area and compare what happens in another area where you didn't stop the tactic				
c. Find the top 20 areas where this problem exists and toss a coin to assign 10 areas to have the tactic and 10 areas not to receive the tactic and compare				
d. Use data before the police implemented the tactic and compare it to data from after the tactic was up and running				
e. Approach a researcher from a university or research organization to help you evaluate your tactic.				
f. Seek assistance from within the organization to create an evaluation method that would be acceptable to the organization				
g. Undertake online research to try and find out what others have done				
h. Stop a tactic on the basis that a researcher told you there was research showing it was ineffective				

3. In day to day decision making, what do you think the balance should be between the use of scientific research/knowledge (e.g. from universities and research organizations) and personal experience? (Choose one answer)

_____ a. Experience should be most important (90%) and scientific knowledge should make little contribution (10%)
_____ b. Experience should be more important (75%) but scientific knowledge should make some contribution (25%)
_____ c. Experience (50%) and scientific knowledge (50%) should both make an equal contribution
_____ d. Scientific knowledge should be more important (75%) but experience should make some contribution (25%)
_____ e. Scientific knowledge should be most important (90%) and experience should make little contribution (10%)

4. If you had to generally assess the nature of your agency's efforts to reduce crime and disorder, which of the following would best describe those efforts?

_____ a. My agency uses primarily traditional tactics such as random preventive patrol and case-by-case investigations (by type, e.g., auto theft, robbery, homicide, major crimes)
_____ b. My agency uses primarily traditional tactics supplemented by community-oriented policing in a separate unit
_____ c. My agency has adopted a department-wide community-oriented policing approach
_____ d. My agency uses a mix of traditional tactics and more innovative tactics such as problem-oriented policing or hot spots policing
_____ e. My agency uses primarily innovative tactics

5. In your view, what is the top factor that inhibits innovation and reform in policing?

SECTION D

1. How important do you think pursuing higher education (i.e. more than a high school diploma) is for police officers in general?

_____ a. Not important
_____ b. Somewhat important
_____ c. Important
_____ d. Very important
_____ e. Essential

2. What do you think should be the minimum educational standard for new police recruits in your agency?

_____ a. No educational standard
_____ b. High school diploma
_____ c. Some college
_____ d. Associate's degree
_____ e. Bachelor's degree

3. At which rank do you think an understanding of outside research about policing becomes essential for daily work? (Choose the lowest rank where you think such an understanding is essential)

_____ a. Patrol officer/detective
_____ b. First line supervisor/sergeant
_____ c. Lieutenant
_____ d. Captain
_____ e. Major
_____ e. Deputy Chief
_____ f. Chief
_____ g. N/A- research evidence not essential for daily work for any rank

SECTION E

1. Today's Date: _____

2. Gender: MALE_____ FEMALE_____

3. Age: _____years old

4. Are you a sworn law enforcement officer? YES _____ NO _____

5. Total years of experience as a law enforcement officer or civilian employee (in either your current agency or other agencies) _____ years

6. Current Rank/Position:
_____ a. Patrol officer
_____ b. Detective
_____ c. Sergeant
_____ d. Lieutenant
_____ e. Captain
_____ f. Major
_____ g. Deputy Chief or Chief
_____ h. Other (Specify:_____)

7. Roughly how long have you been at your current rank? _____ years _____ months

8. Do you supervise individuals?

_____ YES (If so, how many individuals do you DIRECTLY supervise?_____)
_____ NO

9. Highest level of education achieved

_____ a. High school diploma
_____ b. Some college but no degree
_____ c. Associate's degree or certificate
_____ d. Bachelor's degree
_____ e. Master's degree
_____ f. Professional degree (e.g., law degree, MBA, MPA)
_____ g. Doctorate degree

10. How would you describe your race?

_____ a. American Indian or Alaskan Native
_____ b. Asian or Pacific Islander
_____ c. Black or African-American
_____ d. Caucasian or White
_____ e. Other (Specify:_____)

11. Are you of Hispanic or Latino origin? YES _____ NO _____

12. What special education and training have you received? (Check all that apply)

_____ a. Professional certificate outside department
_____ b. Extensive formal training in a specific area within the department
Specify:_____
_____ c. Crime analysis certification
_____ d. Computer training/certification
_____ e. Other (Specify:_____)

THANK YOU FOR COMPLETING THE SURVEY

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CURRICULUM VITAE

Cody W. Telep was born on April 29, 1984 in Charlottesville, Virginia. He received a Bachelor of Arts degree with a double major in sociology and political science from Emory University in Atlanta, Georgia in December 2005. In August 2006, he began graduate school in the Department of Criminology and Criminal Justice at the University of Maryland and received a Master of Arts in May 2008. He began the doctoral program in the Department of Criminology, Law and Society (then the Administration of Justice Department) at George Mason University in August 2008. He worked as a graduate research assistant for Professors David Weisburd and Cynthia Lum in the Center for Evidence-Based Crime Policy (CEBCP) from August 2008 through July 2012. Beginning in August 2012, he worked as a research associate for CEBCP. He also has served as the coordinator for the CEBCP's Evidence-Based Policing Research Program. Cody's research interests include police strategies to reduce crime and disorder, police legitimacy, evidence-based crime policy, and experimental criminology. His published work while at George Mason has appeared in *Justice Quarterly, Criminology and Public Policy, Journal of Experimental Criminology, Police Quarterly,* and *Journal of Criminal Justice Education.* Cody is a 2012-2013 recipient of the Dean's Challenge Award from the College of Humanities and Social Sciences. He served as president of the Criminology, Law and Society Student Association (CLSSA) from June 2010 until May 2011. In August 2013, Cody will begin as an Assistant Professor in the School of Criminology and Criminal Justice at Arizona State University in Phoenix.