

# Translational Criminology

SPRING 2018

Promoting knowledge exchange to shape criminal justice research,  
practice, and policy

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## CEBCP Mission Statement

The Center for Evidence-Based Crime Policy (CEBCP), housed within the Department of Criminology, Law and Society at George Mason University, seeks to make scientific research a key component in decisions about crime and justice policies by advancing rigorous studies in criminal justice and criminology through research–practice collaborations and proactively serving as an informational link to practitioners and the policy community. *Translational Criminology* advances this mission by illustrating examples of how research is converted into criminal justice practice.

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## FROM THE DIRECTORS

On June 21st the Center for Evidence-Based Crime Policy will mark its 10th birthday at our annual symposium, and we welcome all of you to celebrate with us. For 10 years the CEBCP has provided the research and practice communities with unique resources, including our congressional briefings and symposia, our translation tools and resources, and *Translational Criminology* magazine. We have sought to simultaneously conduct high-quality and impactful research while, at the same time, working to advance knowledge exchange and research translation. As always, our symposium this year will reflect this vision, including multiple panels and workshops on the most pressing issues in criminal justice today. This year, we also welcome the Washington/Baltimore High Intensity Drug Trafficking Areas program into the CEBCP. The new GMU-HIDTA will help us expand our research and outreach in the areas of drug treatment and enforcement, and aid in Mason's effort to address the opioid epidemic.

Of course, we have not done it alone. We have received financial support from Mason's Provost's Office and the College of Humanities and Social Sciences. We have benefited from the advice and involvement of our colleagues and students in the Department of Criminology, Law and Society, and from all of you. The CEBCP's success is due in large part to the commitment of its staff, senior fellows, research assistants and associates, and faculty who not only work on many research projects, but who also volunteer their time to help make the CEBCP magic happen. Our advisory board has been with us all from the start, advocating for our efforts, getting the word out about what we do, and providing sage advice to help us tackle our challenges. Take the time to look at the inside cover of the magazine to see just how many people make CEBCP tick. We are also supported by many people behind the scenes—the Office of Sponsored Programs, staff in the College of Humanities and Social Sciences, Human Resources, Events Management, Mason Catering, Accounts Payable, and the Travel Office. Thank you to all who have made the CEBCP possible.

One unit that supports *Translational Criminology* magazine is Mason's Creative Services. They have been behind the professional look of the

magazine since its inception, and with their help, the CEBCP has made TC a unique Mason creation. We hope you have enjoyed the magazine as much as we have enjoyed bringing contributors together to create it.

In this issue, we provide an update to the *Matrix Demonstration* Projects as its support from the Bureau of Justice Assistance ends, and its new chapter begins. As always, the magazine highlights research use in practice. For example, in this issue we include examples of research applications in the Madison, Wisconsin, Police Department by Cory Nelson, the use of data-driven and evidence-based approaches in Allegheny County's Pretrial Services as described by Janice Dean and Kathryn Collins, and a research-practice collaboration for traffic safety in North Carolina by researchers at the Institute for Transportation Research and Education. Academic contributors April Zeoli and her colleagues, as well as John Shjarback, talk about the practical meaning and challenges of their new research on guns and domestic violence and the "Ferguson Effect," respectively. This issue we also have two contributions focused on research methods, a feature on *p*-values written by Jeremiah Johnson in a feature called "Research Notes for the Field, From the Field" and another on the importance of power analysis in criminal justice research, written by Mason's own Dr. Niloofar Ramezani, a specialist in the area.

Finally, we are sad to report on the passing of Dr. Jeffrey Roth, an important figure in the world of evidence-based crime policy. Our principal fellow, Professor Christopher Koper, who worked closely with Jeff for many years provides his thoughts on his good friend. It is fitting that we celebrate Jeff's life here in *Translational Criminology*, as much of his work and his collaborations embodied the goals that we strive for.

Again, we thank all of you who have supported the CEBCP throughout the years in big and small ways and look forward to seeing all of you at our symposium in June.

Cynthia Lum, *Director and Editor of Translational Criminology*  
David Weisburd, *Executive Director*





CENTER FOR EVIDENCE-BASED CRIME POLICY



For 10 years, the Center for Evidence-Based Crime Policy has been committed to providing its university, local, regional, state, national, and international communities with high-quality research and research translation tools.

We need your help to continue our efforts for the next 10 years.

If you have attended our symposia, congressional briefings or training workshops, read *Translational Criminology* magazine or our handy research summaries, used the Evidence-Based Policing Matrix, video knowledge library, or our other translation tools, then you know the value that CEBCP brings to the field.

With your support, we hope to raise more than \$100,000 before we celebrate the center's 10th birthday at our 2018 symposium.

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The Center for Evidence-Based Crime Policy presents

# The 2018 CEBCP Annual Symposium on Evidence-Based Crime Policy

We welcome everyone to the CEBCP's 2018 annual symposium and special 10th Birthday Celebration on June 21, 2018, at George Mason University's Arlington Campus.

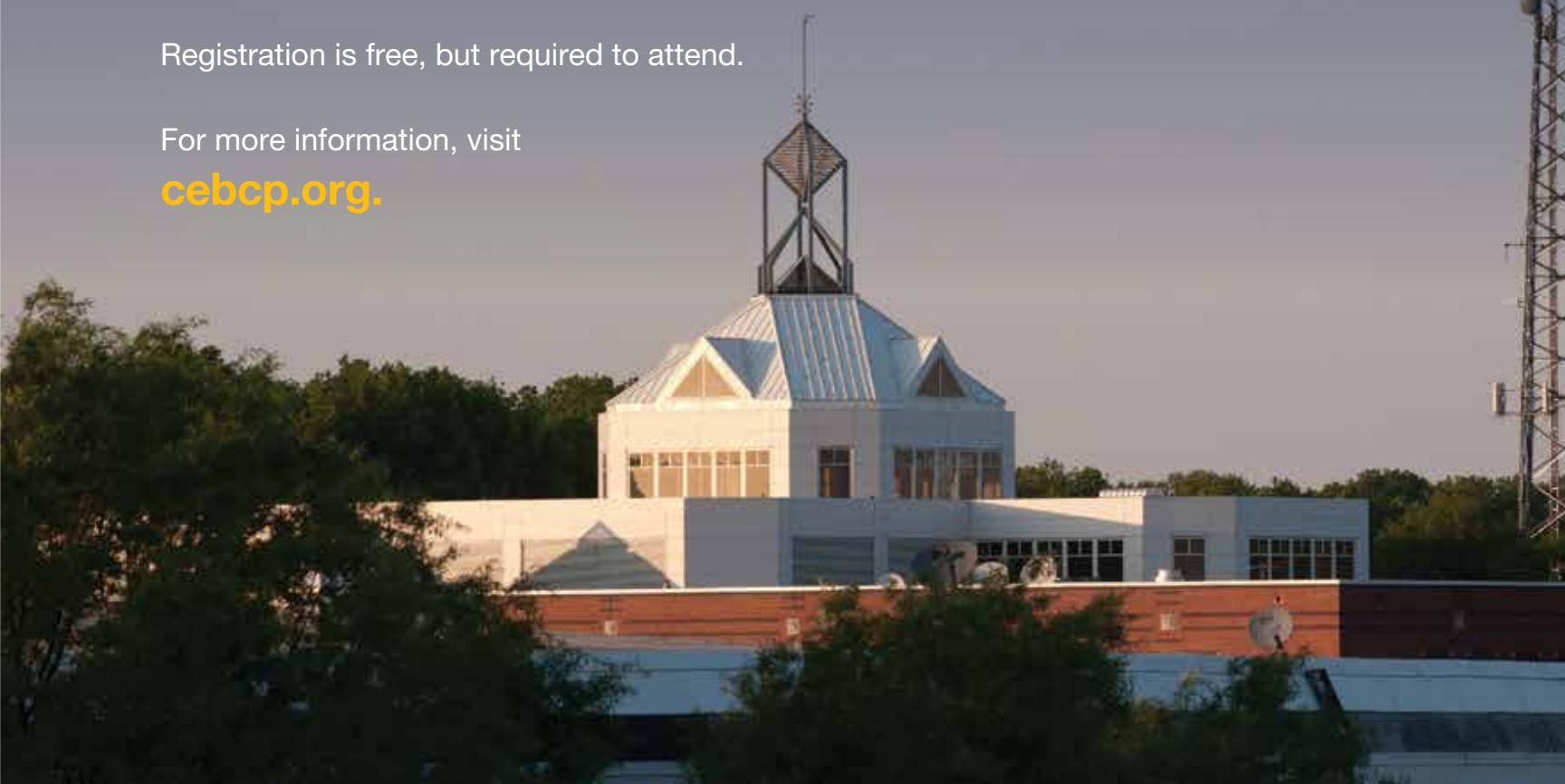
This year's exciting agenda will focus on pressing issues in evidence-based crime policy including the opioid epidemic, forensics investigations, body-worn cameras and license plate readers, school-based crime prevention, mental health, crime prevention, police legitimacy, disparity and criminal justice, practitioner innovations, firearms violence and policy, and data analytics.

At the symposium, the inductions for the 2018 Evidence-Based Policing Hall of Fame will take place, as will the presentation of the Distinguished Achievement Award in Evidence-Based Crime Policy.

Registration is free, but required to attend.

For more information, visit

[cebcp.org](http://cebcp.org).



# The Matrix Demonstration Projects: An Update

BY CYNTHIA LUM AND CHRISTOPHER S. KOPER

*Cynthia Lum is director of the Center for Evidence-Based Crime Policy (CEBCP) and professor of Criminology, Law and Society at George Mason University.*

*Christopher S. Koper is principal fellow at the CEBCP and associate professor of Criminology, Law and Society at George Mason University.*



Cynthia Lum



Christopher S. Koper

For those of you who have been involved with the Center for Evidence-Based Crime Policy from its beginnings in 2008, you likely know about the Evidence-Based Policing Matrix and its associated projects. The Matrix dates back to the early days of CEBCP and is a cornerstone of its translational efforts. It is a research translation tool created for police agencies to help visualize, synthesize, and translate evaluation studies on police crime control strategies (see Lum, 2009; Lum, Koper, & Telep, 2011).

Since then, the Matrix and its associated projects have grown, both in users and in scope. In 2011 these activities became known as the Matrix Demonstration Projects (MDP),<sup>1</sup> supported by a cooperative agreement from the U.S. Department of Justice, Bureau of Justice Assistance.<sup>2</sup> In addition to updating the Matrix each year with new studies, the MDP projects have focused on building collaborations with police agencies and organizations to develop free tools that officers, analysts, and researchers can use to translate research findings and institutionalize evidence-based practices into daily law enforcement efforts.

The MDP team has delivered free workshops, webinars, training, and symposia to disseminate this information to thousands in the law enforcement community. We have also made a concerted effort to expand our efforts to smaller cities, less populated areas, and more rural counties and states. In total, we have now worked with almost 20 agencies in substantive ways through the MDP. The MDP tools are described extensively, along with the research evidence in *Evidence-Based Policing: Translating Research into Practice* (Lum & Koper, 2017). Here we provide an update to the MDP and where we will be going next.

## The Matrix and its Demonstration Projects

The **Evidence-Based Policing Matrix**<sup>3</sup> has been viewed tens of thousands of times and is now used by law enforcement practitioners, policing scholars, and students in the United States, United Kingdom, Australia, and other countries for both learning and training.

The Matrix is a research-to-practice translation tool that organizes moderate to very rigorous evaluations of police interventions visually. Agencies can use the free interactive Matrix to quickly view and assess the field of policing studies related to crime prevention and control (and specific subgroups of these studies). We also provide a handy summary of each study that describes interventions more specifically and what findings mean for law enforcement personnel. The Matrix has been updated with qualifying studies each year and currently houses more than 160 evaluations that have been vetted by a systematic review process. In the future, we hope to expand such visual translational tools to other policing outcomes, such as police legitimacy, citizen satisfaction, and technology use.

The Matrix's original intent was to facilitate **Evidence Assessments**, such as the one Superintendent Howard Veigas conducted to evaluate his agency's deployments in Derbyshire, England.<sup>4</sup> Police agencies are often constrained by the time, funds, human resources, and expertise needed to conduct scientific field evaluations of their strategies and tactics or to gather and synthesize existing research about policing. An evidence assessment, in contrast, provides a relatively quick and inexpensive way for agencies to evaluate their practices by examining how well they align with what is known from research about the characteristics of effective policing strategies. In similar fashion, police can also use the Matrix to estimate the promise of new tactics they are developing or considering. Other

1 See <http://cebc.org/evidence-based-policing/the-matrix/matrix-demonstration-project>.

2 U.S. Department of Justice, Bureau of Justice Assistance, 2011-DB-BX-K012.

3 See <http://cebc.org/evidence-based-policing/the-matrix/>.

4 See Veigas, H., & Lum, C. (2013). Assessing the evidence-base of a police service patrol portfolio. *Policing: A Journal of Policy and Practice*, 7(3), 248-262.

evidence-assessments that we have conducted with colleagues (based on the Matrix and other sources) have examined the recommendations of President Obama's Task Force on 21st-Century Policing, as well as strategies used by the federal Transportation Safety Administration and the Federal Protective Services.<sup>5</sup>

Some of the tools we have developed try to institutionalize evidence-based practices into existing systems of policing. Habits and traditions in policing are hard to break, and sustainable changes often have to come from within policing's internal structures and systems. For example, we created the *Evidence-Based Policing Playbook*,<sup>6</sup> which was developed with the help of members of the NYPD and other police practitioners from multiple agencies. Modeled after a football playbook, the *EBP Playbook* provides straightforward operational directives for actions in the field that are based on rigorous research. The *Playbook* draws knowledge from the Matrix and other sources but uses straightforward and familiar operational statements and guidelines for police officers to use. Today, agencies like the Riley County (Kansas) Police Department use specific plays in the *Playbook* to provide options for police proactivity, and link them to computer-aided dispatch codes to record activities.

Early training and socialization systems provide other opportunities for institutionalizing new knowledge into practice. For example, field training is a time when officers experience, observe, and apply knowledge and skills they acquired in the academy to practical tasks. Field training experiences can have a substantial impact on officers' initial impressions about what is high-quality police work and whether they develop proactive and community-oriented habits. Thus, we created the **Field Training Transformations Demonstration**<sup>7</sup> with the assistance of the Alexandria (Virginia) Police Department to suggest ideas on adjusting field training activities and performance metrics to reflect research evidence on effective policing.

We also recognized the challenge of incorporating research-based knowledge into training academies, which led to the creation of the **Academy Curriculum Demonstration**, the **Building Trust and Confidence Training portal**, and specific **in-service training on the use of crime analysis for operations and leadership**. Each of these provides free training modules in important areas of evidence-based policing so that agencies that do not have access to or funding for specialized training can still receive it. We have also recorded many presentations, workshops, and trainings, which are freely available for

use in Compstat meetings, in-service training, or other opportunities for dynamic learning. We have conducted more than three dozen trainings over the life of the project, touching almost every region of the continental United States.

A tool we developed to infuse evidence-based policing into investigative practices is the **Case of Places Tool**.<sup>8</sup> Police spend an incredible amount of time and resources investigating individuals and crime incidents that have already occurred. However, studies show that crime is geographically concentrated at very small locations. These concentrations are stable over time and influenced by various situational and environmental factors as well as routine activities. Numerous studies in the Matrix have illustrated the utility of focusing police patrol and problem-solving approaches at these locations to prevent crime and disorder. The Case of Places Tool is an attempt to apply traditional investigative practices (e.g., locating and interviewing suspects, witnesses, and victims, gathering evidence, following leads) to a different unit of investigation: places. The tool emphasizes systematic investigation and tracking of problem places to assist police with developing problem-solving prevention strategies for these locations.

The MDP has also led to the development of guides and assessments to facilitate evidence-based policing. For example, for those who want to take on their own in-house experimental or quasi-experimental field evaluations, we partnered with Renee Mitchell of the Sacramento (California) Police Department to develop a **Ten Step Guide for Developing In-House Experimental Evaluations**.<sup>9</sup> The **Receptivity Survey**<sup>10</sup> is an assessment tool that, with the efforts of Professor Cody Telep at Arizona State University, we have implemented in numerous agencies to gauge how open, or receptive, officers are to using research and evidence-based approaches. With partners in the Fairfax County (Virginia) Police Department, we have tested out an **evidence-informed community survey process**<sup>11</sup> to help agencies develop their own community surveys. We have also engaged with **first-line supervisors**<sup>12</sup> to figure out ways for them to guide and support their efforts in implementing evidence-based policing in the field. Finally, our **Technology Web Portal**<sup>13</sup> is also linked into the MDP to provide ideas on acquiring, implementing, and evaluating technology in policing. The portal also provides research reviews on technologies like body-worn cameras and automated license plate readers.

In other MDP efforts, we created the **eConsortium for University Centers and Researchers for Partnership with Justice Practitio-**

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5 All of these reports can be accessed at <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/evidence-assessments/>

6 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/playbook/>

7 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/transforming-field-training/>

8 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/case-of-places/>

9 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/experiments/>

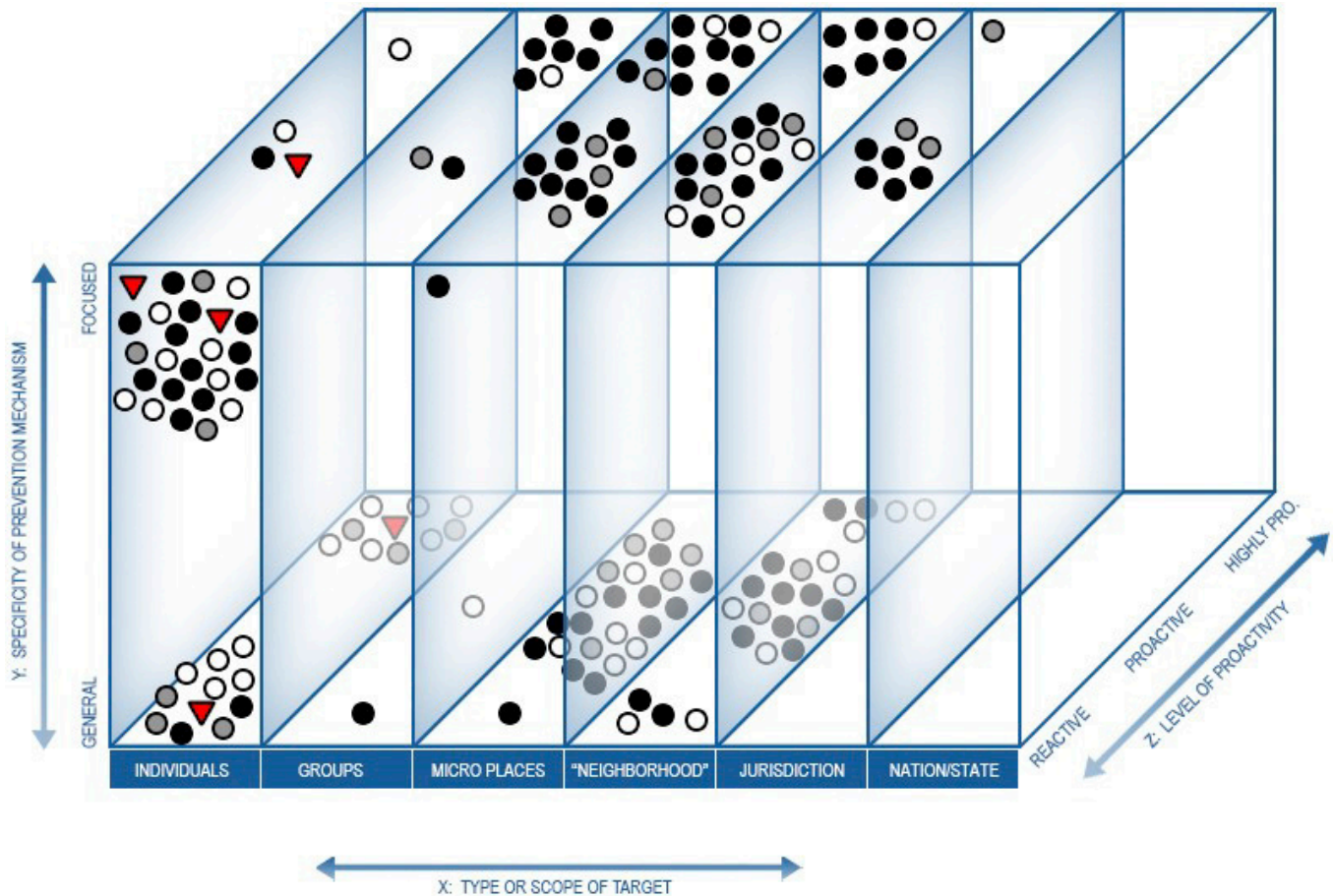
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10 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/receptivity-to-research/>

11 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/surveying-communities/>

12 See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/supervisors/>

13 See <http://cebcp.org/technology/>



**The Evidence-Based Policing Matrix**

ners<sup>14</sup> to facilitate partnerships between university researchers and practitioners. We have also conducted what we call “mini” Smart Policing projects to use research in applied ways. These projects are initiated by agencies and address a specific operational concern. For example, we have conducted community surveys to understand community sentiment and legitimacy, analyzed traffic stop data for racial disparities, evaluated the impact of reallocating patrol resources for hot spots policing, analyzed patterns of firearms violence to reduce shootings, developed studies of traffic fatalities, and assessed academy learning. These research projects have also enabled us to engage our graduate students in evidence-based policing, a core goal of our efforts here at George Mason University.

The Matrix and its unique demonstration projects are continually developing and improving. While BJA funding for the MDP has now officially ended, we hope to find new support to maintain the Matrix and its demonstrations. Future efforts will include evaluating the efficacy of our translation tools, developing new matrices for other policing outcomes, and finding new ways to measure police performance. Continuing to make research accessible and useful to

law enforcement is our priority, and an important value we want our graduate students to internalize. We hope you will continue to find the Matrix and its demonstration projects useful as we refine and expand on them in the future.

**References**

Lum, C., & Koper, C. S. (2017). *Evidence-based policing: Translating research into practice*. Oxford, UK: Oxford University Press.

Veigas, H., & Lum, C. (2013). Assessing the evidence-base of a police service patrol portfolio. *Policing: A Journal of Policy and Practice*, 7(3), 248-262.

Lum, C., Koper, C., & Telep, C. (2011). The evidence-based policing matrix. *Journal of Experimental Criminology*, 7(1), 3-26.

Lum, C. (2009). *Evidence-based policing: Translating research into practice*. Ideas in American Policing Lecture Series. Washington, DC: The Police Foundation.

<sup>14</sup> See <http://www.gmuconsortium.org/>



# From Research to Practice, Two Decades Later: Evidence-Based Policing in Madison, Wisconsin

BY CORY NELSON

*Cory Nelson is a captain in the Madison (Wisconsin) Police Department, currently serving as the West District Commander. He is a Certified Public Manager, a Wisconsin Command College graduate, and a National Institute of Justice LEADS Scholar.*

Fellow police officers: Some of you may have begun to learn about a variety of research being done in police agencies, focused on evaluating programs and practices from police efforts to control crime, to use of force policies, to officer wellness programs. As practitioners, you likely have the same question that I did: Does this stuff really translate to the real world? Do these researchers really know what is going on in the streets?

Before sharing with you my experience, a bit of background about me: I am a captain with the Madison Police Department and am responsible for the West District, which is the largest district in the city (85,000 residents in the district, 250,000 in the city). I have 29 years on and retirement is within sight. But I suspect many of you will agree with me—giving maximum effort is as important the first day on the job as it is the last. For me, this means trying new things and always trying to improve. Luckily, being in my position and having a supportive Chief Mike Koval, and Assistant Chief Randy Gaber, I have been allowed to experiment with new ideas.

Good fortune struck in 2014, when I was accepted to the National Institute of Justice “LEADS” program. By now, some of you may be familiar with the LEADS acronym, which stands for “Law Enforcement Advancing Data and Science.” In 2014, most of us were not familiar with the program; I was in the second class of 10 officers selected to participate. My selection was a bit of a surprise to me, as I was not sure what it was all about. However, it did sound like a great opportunity to be exposed to what was going on with policing at the national level and to gain insight into current policing research that was being generated by researchers around the world.

My eyes were opened when I began the program. Many of the people selected to be LEADS scholars had already been involved in their own research projects within their agencies, and many had advanced degrees. This group really is the future leaders of policing in this country. Most of them are what is now known as “pracademics,” a combination of a practitioner and an academic. It was truly amazing to hear them speak and listen to their breadth and knowledge about a variety of police-related topics.



Cory Nelson

Believe it or not, most street cops (including myself) aren't exposed to the decades of research that has been done on policing. We know what we learn in the academy and what we learn on the streets. We learn how to shoot, weapons mechanics, case law, constitutional rights, defensive tactics, how to de-escalate situations, and how to deal with mentally ill people, along with a host of other topics. We typically don't learn about research projects, outcomes, and theories.

But as a district commander, it is also my responsibility to share as much information as I can with my officers that will help them do their job well, including ideas and research about effective police practices. Officers confront so much daily frustration; why try to reinvent the wheel when so many people have already spent time researching and testing a number of patrol strategies? But prior to being involved with LEADS, I had no idea about the amount of knowledge that is out there for us to use.

In 2017, as part of our LEADS Summer Symposium, our group was invited to the Center for Evidence-Based Crime Policy's annual symposium at George Mason University. I was again in a bit of shock to hear even more research and findings on issues that we in the policing world often wonder about every day. Hearing research direct from legendary policing scholars was an experience I will not soon forget. The ink was flying as I filled pages and pages of a legal pad with my notes, anticipating sharing what I had learned when I got home.

During the second day of our symposium, our LEADS group was fortunate enough to have a master class on evidence-based policing with Professors Cynthia Lum and Chris Koper, discussing a variety of crime reduction and prevention topics. It was on this day that I scored a home run for my city.

Dr. Koper was discussing his Koper Curve theory on crime suppression and deterrence. Many in class were already very familiar with the Koper Curve Principle. However, it was the first time I had heard about it, despite that this idea has been around since 1995!<sup>1</sup> As I heard the professors discuss this idea of randomly showing up in crime hot spots and spending 15 minutes of police and/or citizen engagement to create a

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<sup>1</sup> See Koper, C.S. (1995). Just enough police presence: Reducing crime and disorderly behavior by optimizing patrol time in crime hotspots. *Justice Quarterly*, 12(4): 649-672. A summary of this article can be freely downloaded at the CEBCP's "One-Pager" site, located at [cebcp.org/one-pagers/](http://cebcp.org/one-pagers/)

deterrent effect, a bell began ringing in my head. It now all made perfect sense. What a simple yet brilliant idea! Keep the bad guys on their toes, making them think we are around all the time, even when we cannot be. And, it also allows us to be more proactively visible in the community. I could not wait to get home to try it!

I returned to Madison that summer to seemingly skyrocketing violent crime and shooting incidents. Our “Shots Fired” reports were up 79 percent over 2016. We were authorized overtime hours to do what we could to get the gunplay under control. I met with Assistant Chief Randy Gaber and ran the Koper Curve idea past him. He was all for it and gave the green light for me to work on a project in my district.

My first step was to get our crime analysts Brayton Grinnell and Caleb Klebig involved. I am no expert in data, but they are, so they were my first call. When we met, they also already knew about the Koper Curve theory and were excited that I was actually going to try it in our city. The analysts were full of questions: where, when, how long, how we were going to identify our hot spots, how many hot spots, how to document our officer hours spent?

We decided that we would begin by using shooting incidents, weapons offenses, and robberies to identify our hot spot areas and would add further layers if we saw the need for more data. Our data scan was for the first six months of 2017, and we found 87 violent crime incidents that fell within our identified parameters. At that point, we merged a shots-fired heat map with our violent crime heat map to identify our district hot spots. We then identified four hot spot areas for our project. These four places were responsible for 88 percent of the shooting incidents in our district. Our analysts also identified the busiest times and days of the week for us to concentrate our efforts.

The analysts made an additional and important point: They needed a way to track our efforts to see if our application of the Koper Curve principle in those hot spots would work. We decided to have our officers generate a call for service number each time they stopped in a hot spot for their 15-minute engagement, and they would enter the word “Koper” in the call notes. This way, our analysts could go back and query the CAD records data for the amount of time each day our officers were engaging and where they were deploying themselves.

The next step was to get our officers on board. The “hottest” hours the analysts identified were from about 3 p.m. into the early morning hours, which are also the busiest times for our patrol officers. Fortunately, in our district we have a lieutenant who is responsible for coordinating our response to long-term problems. I put Lt. Lori Chalecki in charge of staffing and daily tracking of results for our project. We decided to put the day-to-day responsibility of operationalizing the program on our district’s Community Policing Team, a six-officer group with a K-9, led by Sgt. Chuck Weiss. The Community Policing team’s daily responsibilities can change from dealing with drug houses, to conducting traffic enforcement, to whatever the crime problem of the day may be.

We also decided to supplement the initiative with our neighborhood officers whose areas coincidentally covered some of the hot spot locations. Some of the engagement efforts were carried out using overtime, since each of these officers also has some primary duties that cannot be ignored. We decided we did not want to pull our neighbor-

## WEST DISTRICT SHOOTINGS

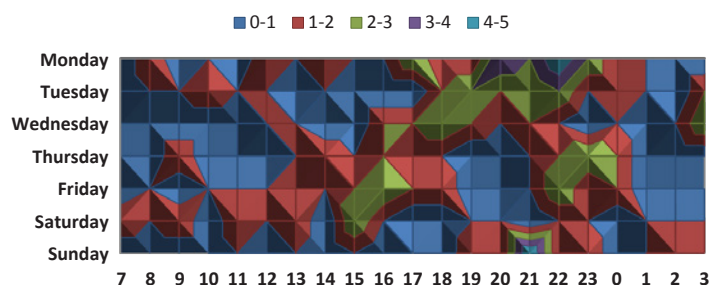


Figure 1. Western District shooting “heat” map.

hood officers out of their neighborhoods for weeks on end during this project. We also paid overtime to patrol officers who were on days off and wanted to be a part of the initiative.

These officers’ mission was simple: patrol the four hot spots randomly for about 15 minutes at a time every two hours. When they go to the hot spot, we asked them simply to get out of their cars and engage with citizens. Sometimes, they handed out crime prevention pamphlets from Crimestoppers. I asked them to shake hands and kiss babies. Whether it was throwing a ball to a child, handing out stickers or baseball cards, or just listening to someone vent about their day, I did not care, as long as they were present.

We asked them to engage in each hot spot at least four times per day during an eight-hour shift, so we visited our four hot spots, a total of about 16 times per shift. We focused on the hot times of the day that were previously identified by our analysts. Several times a week, we ran four-hour overtime shifts so each hot spot was able to get at least two more visits per shift. We attempted to run this every day of the week.

Of course, if they saw a known violent criminal engaging in illegal activity or a known wanted person, they were asked to take enforcement action. We did sprinkle in some days where we made concerted efforts with our department along with federal partners in picking up targeted wanted people who had warrants for violent crimes. But I emphasized that their primary mission was to be seen and to engage with members of the community. What we didn’t want was to create a negative reaction from people living and working in these hot spots. Fully aware of our city’s racial disparity concerns about criminal justice, we did not want as our goal to increase traffic tickets or minor ordinance violations to residents in these communities, which are often communities of color. Rather, our goal was to engage with residents, show them that we were present and willing to help.

After a few weeks of implementing our intervention, we felt immediate relief as we were not getting calls of shots fired every day. The officers engaged in the efforts were smiling and telling me they were actually having FUN! They liked the fact that they were not expected to write speeding tickets to rush-hour commuters coming home from work. They weren’t expected to cite every person that drove past them without a license. Our officers were even being invited to share food with people. They were making friends, creating new relationships and building trust—all important steps in preventing crime.

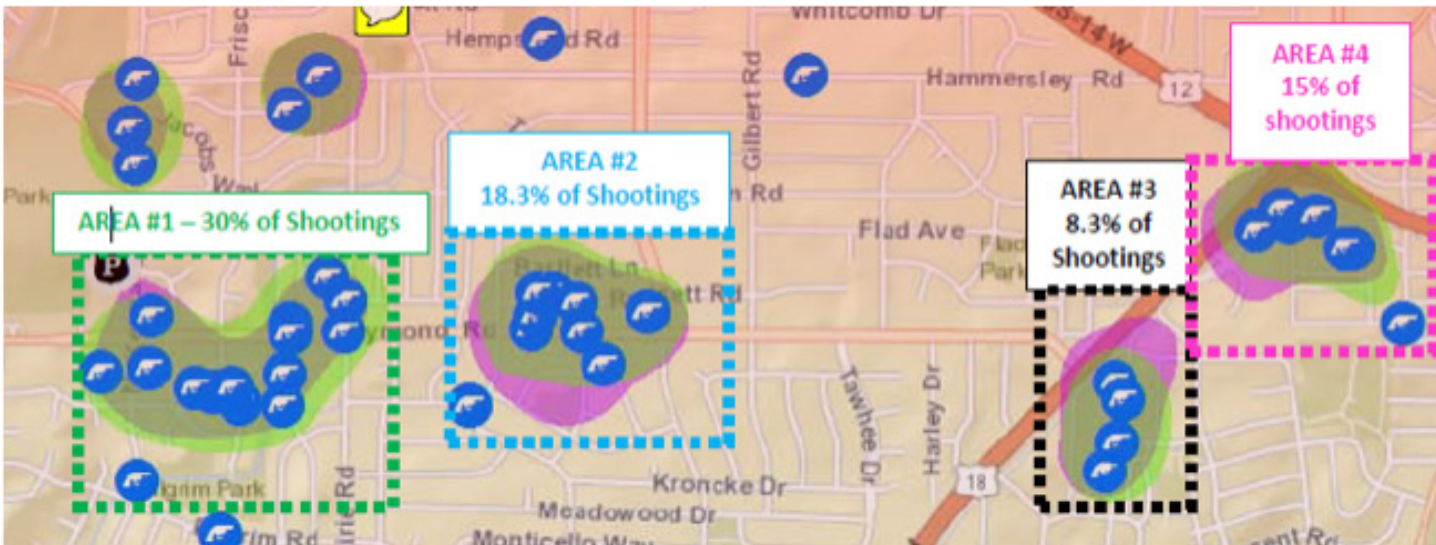


Figure 2. Western District shootings crime map.

The officers also remarked that they liked the fact there was a purpose behind the project and a measurable outcome that we were trying to achieve in reducing the violent crime in the hot spots. We were not out using a shotgun approach, but instead were focusing our efforts and working on specific problem areas.

We also received feedback from the residents who live in the hot spot areas. They now felt safer, they liked seeing the officers around, and they had the impression that the officers were there all the time. They figured out we were not just there to arrest people. Officers often told me that they also felt that law-abiding citizens in the hot spot areas were supportive of them. Meanwhile, they also felt that they were making those causing problems much more uncomfortable.

Our efforts ran for three months (August through October). Forty-four different officers documented engagement efforts in our hot spot areas during this time period. Our results were eye-opening. During those three months, we saw a 72 percent reduction in violent crimes and a 66 percent reduction in shots fired incidents in our hot spots are. Although not formally measured, I also believe we have strengthened our community trust in these areas. Residents now realize we want the same thing they do, we all want a safe community to live in, especially for our kids.

We are now considering expanding this effort citywide in 2018 due to the success of the project in 2017. Paying officers to staff this on overtime is not a sustainable option so we will have to figure out how to staff this with officers on regular time. Figuring out how to free up more patrol officers to get them involved in these proactive efforts, as well as being able to respond to 911 calls will be a challenge. At the same time, I also know that research has consistently found that proactive policing efforts like our initiative can reduce calls for service over time, thus freeing up patrol officers for other proactive projects.

I hope my own lessons learned through this journey in LEADS come through loud and clear. Every officer, no matter what rank, should be empowered to look outside his or her own department and take a peek into the world of policing research. Be prepared, it is vast, but there have been many efforts to make it digestible for officers<sup>2</sup>. Be bold and take a chance on trying something that makes sense in your community. We did and it worked, and now Madison is a better place, because of a chance I took on some information from a researcher.

<sup>2</sup> See, for example, the Evidence-Based Policing Matrix developed by Professor Lum and Koper at [cebc.org/evidence-based-policing/the-matrix/](http://cebc.org/evidence-based-policing/the-matrix/) and summarized in Lum, C., and Koper, C.S. (2017). *Evidence-Based Policing: Translating Research into Practice*. Oxford, UK: Oxford University Press.

# Evidence that Gun Laws Can Reduce Intimate Partner Homicides

BY APRIL M. ZEOLI, ALEXANDER MCCOURT, SHANI BUGGS, SHANNON FRATTAROLI, AND DANIEL W. WEBSTER

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Forty-four percent of women and five percent of men who are killed in the United States are killed by their intimate partners, and the majority of those homicides are committed with guns (Fox & Friedel, 2017). As Campbell et al. (2003) have indicated, abusers with access to firearms elevate the risk of a lethal outcome in intimate partner violence fivefold. To counter this concern, a number of states have tried to restrict individuals who commit domestic violence from purchasing and possessing a firearm. But are these interventions effective in reducing intimate partner homicides (IPH)?

In a recent longitudinal analysis (Zeoli et al., 2017), we examined whether state laws are associated with lower rates of IPH. We analyzed the number of IPHs per year in 45 states over 34 years (1980 to 2013). Five states were not included due to extensive gaps in data on IPH. We also examined specific types of laws for different states, and when each law went into effect, which varied considerably from state to state. For example, enactment dates for laws requiring persons with domestic violence restraining orders (DVROs) to relinquish their guns range from 1993 to 2013 for the states in the study.

In addition to the firearm laws under study, our statistical models controlled for the size of the population at risk, national trends in IPH, baseline differences in rates of IPH by state, and state-level factors that have been correlated with IPH, such as police staffing levels, economic indicators, and fluctuations in homicides in general. We included these measures so that variation in IPH rates that was due to these other factors would not be attributed to the firearm laws in our analyses.

To test whether each law was correlated with IPH, we analyzed the IPH trend for each state before and after that state enacted the law (for states that have the law). The model assessed the amount of change



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coincident with the enactment of each law across states to determine average change and whether this change was significant. For something other than the law to produce the correlation observed, it would have to act at the same time each law was enacted in each state, and it would have to produce the effect we hypothesize the law to have. Given that we found significant correlations for multiple firearm laws, this scenario would have to occur for each law, an unlikely scenario.

## What Did We Find?

***Comprehensive state laws that restrict respondents to domestic violence restraining orders (DVRO) from purchasing and possessing firearms are associated with fewer intimate partner homicides.*** Overall, DVRO firearm restrictions were associated with a 13 percent reduction in rates of IPH with firearms and a 9 percent reduction in total IPH in our study, a result that is consistent with prior research (Vigdor & Mercy, 2006; Zeoli & Webster, 2010). The broader the DVRO firearm restrictions, the clearer the effects were on reduced IPH. Statistically significant reductions in IPH rates were evident only for state laws that extended DVRO firearm restrictions to cases involving dating partners and to ex parte orders and final orders.

***State laws that include implementation provisions related to the firearm restrictions are associated with fewer intimate partner homicides.*** State laws that allow or require judges to order dispossession of firearms by those prohibited from possession under DVROs were associated with a 12 percent reduction in firearm IPH.

***State laws that prohibit people convicted of violent misdemeanors (including domestic violence misdemeanors) are associated with fewer intimate partner homicides.*** When states broadly prohibit those convicted of violent misdemeanor crimes from legally purchasing and possessing firearms, our analyses show an associated 23 percent reduction in IPH rates. Similar to prior research (Vigdor & Mercy, 2006; Zeoli & Webster, 2010), we found no measurable impact of laws that only restrict those convicted of misdemeanor crimes of domestic violence. One reason comprehensive violent misdemeanor restrictions may be particularly effective is the ease of identifying those subject to the prohibition. Determining which violent misdemeanor convictions involve domestic violence (and are therefore disqualifying) through the background check system is more challenging than simply identifying violent misdemeanor convictions. The strong protective effects of extending firearm restrictions to a much broader group of violent misdemeanants than restricting firearm access only for those convicted of crimes identifiable as domestic violence may also be a function of more violent individuals being kept from having firearms.

***State laws requiring handgun purchasers to obtain licenses or permits to purchase handguns are associated with fewer intimate partner homicides.*** Disqualifying individuals with a history of violence from possessing firearms may be insufficient for blocking their access to firearms if firearm laws have important gaps such as exempting private transfers from background check and record-keeping requirements. While we found no direct effect of comprehensive background check laws that did not include a licensing or permit requirement for handgun purchasers, when such permits were required our findings indicate that the laws independently lowered IPH risks by 11 percent and greatly enhanced the protective effects of DVRO firearm restrictions.

### **How Do These Findings Translate to Criminal Justice Practice?**

Can state laws that restrict firearms possession by those who commit domestic violence reduce intimate partner homicide? Our research and other evidence indicate the answer is “yes.” In fact, our findings suggest that restricting possession by those who commit violence more generally can also impact rates of IPH. Given these findings, what might criminal justice practitioners do to use this evidence to their advantage?

One important law enforcement and courts intervention is that justice responders discuss restraining orders with victims of domestic violence and how to obtain them. Civil DVROs, which are initiated by victims, take effect quickly. This research, and that of others, suggests that restraining order firearm restrictions save lives. Law enforcement officers

on the scene of domestic violence incidents should take particular care to explain to victims what a DVRO is, the firearm prohibition, how it works, and encourage them to use this tool if it is safe for them. Even in states that do not have a specific law restricting those subject to restraining orders from purchasing and possessing firearms, the federal restriction on respondents to these orders (18 USC § 922(g)(8)) may still apply. Additionally, judges have the implicit authority to include in the restraining order remedies they believe will safeguard the victims, and can apply firearm restrictions independent of explicit state law.

In determining the safety of the victim of domestic violence, law enforcement officers should ask about the suspect’s access to and use of firearms. Police reports may be used as evidence in DVRO hearings and often form the basis for later criminal charges. Detailed incident reports about what law enforcement learned and observed on scene, including information about the suspect’s access to firearms, and any use of those firearms—including threats and brandishing—can be important sources of evidence for establishing whether respondents have access to guns if restraining orders are issued. In some states, this information is key to judges ordering firearm dispossession from those under restraining orders and may be the best source of information for law enforcement charged with enforcing these orders. For example, Alaska law allows judges to order a respondent to relinquish firearms if the respondent possessed or used guns during the violence. A pilot initiative in California revealed that administrative data, including law enforcement reports and arrest records, provided law enforcement serving DVROs with reliable information about respondents’ access to guns (Wintemute, Frattaroli, Claire, Vittes, & Webster, 2014).

Additionally, proactive steps are needed to ensure that restraining order respondents follow the law and are dispossessed of firearms. Many states lack a firearm dispossession law. In states that have such laws, implementation can vary greatly across jurisdictions. The literature includes examples of communities implementing successful dispossession programs that may offer guidance to other jurisdictions about how to engage criminal justice stakeholders to implement dispossession protocols in their own jurisdictions (Wintemute et al., 2014).

Prosecutors should charge suspects under statutes that qualify for firearm restrictions. Preventing people who have proven themselves dangerous from purchasing and possessing firearms can save lives. For this law to have a greater impact, prosecutors must charge violent individuals under statutes that qualify for the firearm restriction.

Yet another option available to justice practitioners are permit-to-purchase systems. Permit-to-purchase systems are an effective way to implement purchase restrictions. These systems authorize law enforcement to determine who is eligible to purchase a firearm. Having to obtain a purchase permit from law enforcement may discourage prohibited people who would otherwise have attempted a straw purchase, used a fake ID to pass a background check from a licensed dealer, or purchased a gun from a private seller.

***Continued on Page 23***

# What Role Should Criminologists Play in Criminal Justice Debates? A Push for Public Criminology with a Cautionary Note

BY JOHN A. SHJARBACK

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Public and media interest in the criminal justice system, particularly in American policing, has increased in recent years. This interest has been spurred, at least in part, by the events in Ferguson, Missouri, and a number of other high-profile deadly force incidents involving officers and minority citizens. Perhaps it has something to do with the growth of social media platforms and the fact that some of the deaths since the summer of 2014 have been graphically caught on video and widely circulated across the internet. While criminologists—those paid to research and teach about justice system issues—might view more attention being directed to the criminal justice system positively and deserving of public discourse, the increase in interest also presents new challenges, such as opening the door for speculation, erroneous claims, and uninformed opinions. Just as the internet is flooded with distortions of other areas of public policy, so it is for crime and criminal justice.

The purpose of this essay is to discuss the role criminologists should play in current criminal justice debates. I argue that criminologists have a responsibility, especially in today's climate, to engage in more "public/translational" criminology. This means that they should actively work to disseminate their research in a consumable way to a broader set of audiences, including both practitioners and the general public. At the same time, however, criminologists must remain cautious about this role and recognize the potential for bias and misinterpretation.

There has been much speculation regarding crime and policing since the deaths of Michael Brown and Eric Garner in summer 2014 (i.e., "post-Ferguson"). Most notable are claims of a "Ferguson Effect," referring to an alleged increase in crime across the country due to the largely untested hypothesis that officers are now engaged in "de-policing"—or retreating/withdrawing from active police work—in response to the negative attention and increased scrutiny of law enforcement. In addition to discussions of the Ferguson Effect and de-policing, there have been debates over whether the current climate and purported anti-cop rhetoric has made it more dangerous for American police; a new "War on Cops" was proposed, whereby officers are more at-risk for ambush and violent victimization than in years past. Finally, some have claimed that all of the controversy surrounding law enforcement is leading to fewer people aspiring to become police officers, resulting in fewer qualified recruits. These claims have been primarily based on anecdotes and rhetoric rather than rigorous and systematic evaluation.



John A. Shjarback

Several reasons account for this state. For one, there is a relative lack of criminal justice data at the national level. Where national-level data does exist, they suffer from exorbitant lag periods up to a year and half. Richard Rosenfeld (2007; 2015), among other criminologists, has written about this issue at length. The Federal Bureau of Investigation's Uniform Crime Reports (UCR) and Law Enforcement Officers Killed or Assaulted (LEOKA) Program are prime examples. In fact, the absence of timely national-level crime data contributed to the debate over whether crime was on the rise in the country after Ferguson in the first place. No

one—not criminologists, journalists, or even the FBI director himself—was in a position to make an informed determination. But the dearth of data cannot take all of the blame—criminologists' reluctance to venture outside their academic circles also gives rise to the speculation.

Crime is a large and complex social problem. The general public, while interested and opinionated on criminal justice issues, tends to be uninformed about the system and its workings. Additionally, most practitioners do not have enough time in their day to stay current on the latest findings from studies. Even among those willing to seek out empirical research, access to peer-reviewed academic journals is firewalled and costly. As such, these studies remain isolated in outlets reserved, almost exclusively, for people with a university affiliation and subscription. Traditional news and social media are not necessarily the most reliable platforms for the consumption of accurate and balanced information. They generally have an ideological bias, either conservative or liberal, so people are receiving a filtered product on topics that are too complex to discuss in short segments.

Most media outlets and even journalists reporting on crime do not know enough about the justice system's issues and challenges to adequately inform the public. What is lacking is high-quality information and empirically rigorous perspectives to bridge the gap between perception and evidence, particularly as it relates to the criminal justice system broadly and policing more specifically.

Because of these issues, there are great benefits for criminologists to engage in more "public/translational criminology." Criminologists can, and some do (e.g., Chris Uggen and his work with *The Society Pages*), attempt to close that proverbial door for speculation, erroneous claims, and uninformed opinions. My co-authors—Scott Decker, David Pyrooz, and Scott Wolfe—and I saw an opportunity to do so with the increase in public and media interest in crime and policing over the past few years. There was much discussion and debate as to whether de-policing was occurring

among the nation's law enforcement agencies and what consequences, if any, it might have on crime rates.

We set out to test de-policing more systematically (like many in our field aim to do) by using publicly available data on vehicle stops and post-stop outcomes among police departments in Missouri provided by the Missouri Attorney General's office. Finding that police across the state made 100,000 fewer stops in 2015 compared to 2014, that departments serving jurisdictions with larger African American populations were more likely to display signs of de-policing (i.e., they conducted fewer stops and made fewer searches and arrests stemming from those stops in 2015), and that de-policing had no effect on violent or property crime rates among the municipalities in our sample from 2014 to 2015, we submitted the paper for peer-review and it was published in the *Journal of Criminal Justice* in May 2017 (see Shjarback, Pyrooz, Wolfe, & Decker, 2017).

But that, in our opinion, was not enough. We wanted to disseminate what we found beyond our academic circles in order to share our findings with practitioners and the general public. And we believed the most efficient way of doing so, casting the largest reach, was writing an op-ed article in a national newspaper. *The Washington Post* accepted it and the op-ed was published in September 2017; we wrote a follow-up piece in the *St. Louis Post-Dispatch* shortly thereafter. They were generally well received, as indicated by readers' comments; however, a critique was provided by a law enforcement contributor on Officer.com (Davis, 2017). The op-eds likely had a bigger impact than the peer-reviewed article in terms of the scope and number of readers, and the hope was that they would contribute to the national dialogue of crime and policing in the post-Ferguson era. Op-eds are simply one of the many ways that criminologists can expand their influence, and there is a much room for improvement we, as criminologists, can make in regard to sharing our work with practitioners and the general public.

Yet, caution is also needed when considering criminologists' role in criminal justice debates, and there are a few caveats worthy of discussion. Political values and the potential for bias, as well as self-interests in protecting research partners (e.g., police and correctional agencies), are the obvious elephants in the room. Scholars like John Paul Wright and Matt DeLisi (2017) have argued criminology, similar to other social science disciplines, suffers from a lack of ideological diversity with most of field self-reporting liberal political values. Values and biases, from either end of the political spectrum, can shape the type of research that is conducted, how results are interpreted, and the policy stances that are taken.

The focus of criminologists should remain on asking and answering empirical questions rather making a priori assumptions and judgments before the scientific process has taken place. Though there are some who might argue that activism is appropriate, the challenge is to stay objective and avoid being activists cloaked in researcher robes. Only then will our contributions to "public/translational criminology" be taken as seriously as possible in policy and practitioner circles and among members of the general public.

Equally as important, criminologists must acknowledge that not all research is created equally. Studies exhibit wide variation in terms of the quality of data, measures, and methodology employed. Larry Sherman and

colleagues (1998) and Jerry Ratcliffe (2017) are deserving of credit for reinforcing this reality. Scholars must be cognizant of this when reaching out to practitioners and the general population and discussing if the findings from our research can be generalized to other samples, agencies, regions of the country, etc. An effort must be made to only talk realistically about our studies and to avoid making recommendations beyond what the data and findings can speak to.

It remains to be seen whether recent increases in public and media attention in justice system issues is a good or bad thing for criminology and those working in policing, courts and sentencing, and corrections. Of course it has increased exposure and awareness; however, it might be increasing undue speculation, erroneous claims, and uninformed opinions at the same time.

Criminologists are deserving of a seat at the table, and they should use their status and skill sets to offset, within reason, some of the misinformation being distributed in traditional and social media platforms. Although this essay focused primarily on crime and policing, the message put forth also applies to broader research areas in the field, including contemporary discussions about immigration and crime, the death penalty, and bail reform, which have all been prominently featured in policy and public debates as of late.

## References

- Davis, K. (2017, October 11). Academic absurdity in societal perception: Academics, attorneys and politicians engage in an interesting spin of the facts of crime increases, use of force and American policing. Officer.com. Retrieved from <https://www.officer.com/command-hq/article/20978854/academic-absurdity-common-sense-has-left-the-building>
- Ratcliffe, J. (2017, October 1). Not all evidence is created equally. Blog post. Retrieved from <http://www.jratcliffe.net/blog/not-all-evidence-is-created-equally/>
- Rosenfeld, R. (2007). Transfer the Uniform Crime Reporting Program from the FBI to the Bureau of Justice Statistics. *Criminology & Public Policy*, 6(4), 825-834.
- Rosenfeld, R. (2015, October 15). Crime wave? What crime wave? *The Crime Report*. Retrieved from <https://thecrimereport.org/2015/10/15/2015-10-crime-wave-what-crime-wave/>
- Sherman, L. W., Gottfredson, D. C., MacKenzie, D. L., Eck, J., Reuter, P., & Bushway, S. D. (1998). *Preventing crime: What works, what doesn't, what's promising*. Washington, DC: National Institute of Justice, U.S. Department of Justice.
- Shjarback, J. A., Pyrooz, D. C., Wolfe, S. E., & Decker, S. H. (2017). De-policing and crime in the wake of Ferguson: Racialized changes in the quantity and quality of policing among Missouri police departments. *Journal of Criminal Justice*, 50(1), 42-52.
- Wright, J. P., & DeLisi, M. (2017, August 30). What criminologists don't say, and why. *City Journal*. Retrieved from <https://www.city-journal.org/html/what-criminologists-dont-say-and-why-15328.html>

# P-What? A Practitioner Guide to Understanding *P*-Values

BY JEREMIAH P. JOHNSON

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**A**s police officers and other law enforcement practitioners represent the “front end” of the criminal justice system, so too do they occupy the front end of the research production process. In both situations, they generate the inputs and data that ultimately have implications either for the criminal justice system or for research that they may not see or experience, or that look very different from their inputs. Yet in today’s policing environment, officers, supervisors, and executives are being expected to know much more about the consequences and results of their daily work, and to see the broader picture of their actions. Indeed, evidence-based policing is premised on the idea that officers are more cognizant of the results of their actions, and to heed research and analyses that try to draw connections between inputs, outputs, and outcomes (Lum & Koper, 2017). And, while seeing the bigger picture is obviously important for policymakers and law enforcement executives, middle managers, and first-line supervisors are best positioned to implement and execute data-driven, evidence-based strategies.

Unfortunately, those that work downstream in the research process are not particularly adept at communicating their findings to those outside of their guild. Just like cops are beholden to acronyms, slang, and ten-codes, academics and statisticians speak their own language. For example, when conveying the results of studies that attempt to link our inputs to broader outcomes, researchers may use terms like *statistical significance*, *effect size*, *quasi-experimental design*, *control group*, or *random effects modeling* that mean just as little to a police practitioner as “10-13” means to an academic. While there is a growing movement to make criminal justice research translatable, police need not wait for this revolution to arrive. With just a little bit of knowledge, practitioners can become better consumers of research and wield it to their advantage.

Toward this goal, there are two fundamental pieces of information for practitioners to know: hypothesis testing and statistical significance. A hypothesis is a proposed explanation for an observed phenomenon or a tentative answer to a question (Maxfield & Babbie, 2015, p. 41). When academics partner with police agencies to do research, they are often testing hypotheses about whether and how police interventions (e.g., directed patrol, arrests, or community engagement) lead to particular outcomes (e.g., crime reduction and prevention, better citizen satisfaction, greater police legitimacy).



Jeremiah P. Johnson

Officers generate hypotheses all of the time. For example, when a police officer observes a vehicle weaving in and out of its lane on a weekend night, he or she might hypothesize that the operator is impaired by alcohol and/or another illicit substance. This hypothesis is readily testable through various chemical tests (e.g. blood, breath, urine). Similarly, research hypotheses can be tested using a variety of statistical approaches.

Fortunately, knowing the math behind these statistics is not particularly important for most criminal justice employees; what is most useful is knowing how to interpret findings

from these tests of hypotheses, which are very important to practitioners. When officers are spending time and risking their lives to carry out a crime-reduction operation, they might hypothesize that their efforts will lead to deterrence. Knowing how to interpret a statistical test of this hypothesis is essential to knowing whether organizations should continue spending time, money, and risking officers’ lives for that operation.

One term that practitioners are often exposed to when reading about research where a set of hypotheses were tested is *statistical significance*. A researcher might tell a police chief: “Youth that are diverted from formal arrests for minor crimes versus those who were not had lower re-arrest rates; this finding was statistically significant.” Researchers generally rely on the concept of statistical significance to determine whether or not a given hypothesis (in this example, that a youth diversion program would lead to lower recidivism) is on point. Testing a hypothesis shares some helpful metaphorical similarities with bringing a criminal case to trial (Gau, 2016).

The default assumption in our criminal justice system is that a defendant is legally innocent. In order to achieve a criminal conviction, the prosecution must overcome a high standard of proof (beyond a reasonable doubt) to establish guilt. Similarly, researchers often operate from the assumption that their hypotheses might not pan out, that the aforementioned police diversion program will not have an impact on a juvenile’s reoffending (this is known as the *null hypothesis*). In order to “reject the null” and say that the diversion program did in fact have an effect, researchers’ test results must reach or exceed a predetermined statistical threshold. This numeric measure is commonly referred to as a *p*-value and is used to determine statistical significance.

So, what is a *p*-value? Even scientists struggle to define what a *p*-value is in simple terms (Aschwandt, 2015), and there are ongoing scientific debates about the usefulness and value of statistical significance. But for this lesson, the *p*-value is fundamentally a measure of probability that



something would not have occurred simply by chance. An example from the game of dice throwing might be useful here.

Those who have spent time at a casino craps table or stumbled across a street dice game are likely aware that players use a pair of six-sided die. Some values are quite common in craps (e.g., 6, 8), but others are exceedingly rare (e.g., 2, 12). Assuming a fair set of dice, the probability of rolling a seven (7) and “sevening out” is roughly 16.6 percent. Observed reality does not always match up with predicted outcomes, so the actual occurrence of a number in a series of rolls could be higher or lower than expected. Imagine that a craps player named Greedy is participating in a street game. He is having a run of bad luck and starts to wonder if another player is swapping in loaded dice. Greedy is a reasonable guy, so he establishes a null hypothesis in his mind that the dice are fair. He decides that he is going to observe all of the rolls and, based on his knowledge of probability, test his hypothesis. As the game proceeds, the outcomes begin to diverge from what should be expected mathematically. Specifically, a round-ending roll of seven (6 and 1) is coming up much more often than it should. In fact, the roll of seven comes up so often that he believes there is only a 5 percent chance that so many sevens would be rolled. Thus, Greedy rejects his null and pulls a gun. In this scenario, Greedy set his tolerance threshold to 5 percent, or a  $p$ -value of 0.05 because he thinks that is enough to take action. However, he could have continued to watch the rolls until he determined there was only a 1 percent probability or chance that all of those sevens were purely rolled by luck.

In that case, Greedy would not believe he was being cheated (and pull a gun) until this higher threshold was met ( $p$ -value of 0.01). However, if Greedy is in fact wrong about the dice, he has made what is known as a *Type I error*. A Type I error arises when the null hypothesis is rejected when it should have been retained.

Returning to the hypothetical police diversion program, suppose that after delivering the intervention to 50 juveniles and withholding the program from 50 others, it is discovered that youth who received the program continue to have lower re-arrest rates. This observation could be by chance, or it could be because of other preexisting conditions in those juveniles who received the intervention that made them less likely to be re-arrested. In high-quality tests of hypotheses, researchers consider all of these factors, and also try to carry out robust experiments to take into account these many factors.

$P$ -values are intuitively appealing and have dominated the research landscape for decades, yet there is a growing debate among scientists whether this should continue (Nuzzo, 2014). Perhaps the most important takeaway practitioners can glean from this academic discussion is that the common numeric threshold for statistical significance ( $p = .05$ ) is one of scientific consensus (Wasserstein & Lazar, 2016) rather than objective necessity. Just as jurisdictions may set different blood alcohol content (BAC) limits for the purpose of DWI enforcement, there is nothing magical about where the bright line for significance is set. But it does matter as to whether Greedy pulls the gun, or in the case of the diversion example, whether the chief might continue the program. Researchers might not feel comfortable reporting a finding as “statistically significant” given a  $p$  level of .10, but a police chief might be willing to continue a low-cost program if an evaluation found large positive effects and the statistical model was at least 90 percent compatible with the observed data.

It is also important to remember that not all studies are created equal. Just because a finding is “statistically significant” does not mean that it should be accepted uncritically. Such a finding could be artificially created through a bad research design. In our diversion example, this may have happened if the researcher selected juveniles to receive the program who are least likely to reoffend rather than randomly allocating the intervention to youth that the police come into contact with. Assessing the relative strength of significant findings requires further analysis (e.g., post hoc testing), and not all researchers calculate or report their effect size, which measures the size of an effect. One quick and dirty indicator of statistical strength is to take a look at the number of observations, commonly referred to as the *sample size*. Our dice-rolling statistician, Greedy, might have rejected his null and pulled the gun based upon a distribution of data produced by 20 rolls of the dice. The result might be statistically significant, but it is inherently weak due to the small sample size. If Greedy had bided his time and spent the afternoon observing 150 rolls, he would have greatly increased his statistical power. High statistical power in this case would lower the probability of making a *Type II error* in retaining the null hypothesis (incorrectly concluding that the dice were fair when in fact they were loaded).

Finally, it is worth noting that just because something is statistically significant does not automatically make for good public policy. Statistical analysis rarely has such immediate consequences as facing the end of Greedy’s gun, yet the stakes are infinitely higher. Bad science makes for bad public policy. As the evidence-based policymaking and evidence-based policing movements grow, there is a danger that public organizations could latch on to research that is methodologically weak or statistically flawed, but that show statistical significance.

Translational efforts play an important role by not only pushing out robust research to practitioners (e.g., the Evidence-Based Policing Matrix) but also training officers how to recognize good research and use it to their advantage.

## References

- Aschwandten, C. (2015, November 24). Not even scientists can easily explain  $p$ -values. *Five Thirty Eight*. Retrieved from <http://fivethirtyeight.com/features/not-even-scientists-can-easily-explain-p-values/>
- Gau, J. M. (2016). *Statistics for criminology and criminal justice*. Thousand Oaks, CA: Sage.
- Lum, C. & Koper, C. S. (2017). *Evidence-based policing: Translating research into practice*. New York, NY: Oxford University Press
- Maxfield, M. G. & Babbie, E. R. (2015). *Research methods for criminal justice and criminology*. Stamford, CT: Cengage Learning.
- Nuzzo, R. (February 12, 2014). Scientific method: Statistical errors. *Nature*. Retrieved from <http://www.nature.com/news/scientific-method-statistical-errors-1.14700>
- Wasserstein, R. L. & Lazar, N. A. (2016). The ASA’s statement on  $p$ -values: Context, process, and purpose. *The American Statistician*, 70(2), 129-133.

# Collaborative Efforts to Address and Prevent Fatal Traffic Crashes

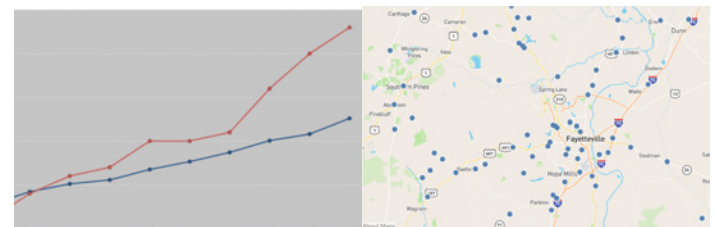
BY TRACY J. ANDERSON, DANIEL J. FINDLEY, TRAVIS E. BAITY, JOSEPH L. GASKINS, GREG FERRARA, MATTHEW KULIANI, AND PAUL FOLEY

*The authors are members of a collaborative research-practice team with NC Vision Zero, a program to reduce fatal and serious injury crashes in North Carolina. Anderson, Findley, Ferrara, Kuliani, and Foley are members of the Institute for Transportation Research and Education at North Carolina State University, and Baity and Gaskins are members of the North Carolina State Highway Patrol.*

In 2016, 1,442 people were killed on North Carolina roads—the highest number of roadway deaths in the state since 2008. To address the unacceptable level of human and economic loss from motor vehicle crashes, North Carolina has joined the Toward Zero Deaths (TZD) movement<sup>1</sup> to prevent traffic death and injury by creating a zero fatalities program. NC Vision Zero (NCVZ) is a collaborative, data-driven initiative to eliminate roadway deaths and injuries in North Carolina. The statewide effort is based on two concepts that remain fundamental to zero fatality programs worldwide—that no death on the road is acceptable and that injury or loss of life is not an inevitable cost of mobility.

At the center of this program is a process called the Fatal Crash Review, conducted biannually by the North Carolina State Highway Patrol (NCSHP). Adapted in 2014, the Fatal Crash Review is a collaborative team effort, involving all ranks of the Highway Patrol, members of its Crash Reconstruction Team,<sup>2</sup> District Attorneys, and the North Carolina Department of Transportation (NCDOT). The Fatal Crash Review uses crash data for evaluation and adaptation to changing patterns throughout the year. The Highway Patrol accesses crash data through NC Vision Zero Analytics (NCVZA), an online data visualization tool, which delivers crash statistics by safety category, location, time of day/day of week, and demographic categories as shown in Figure 1. NCVZA produces a Scorecard for the state, troops, and districts, showing their progress on crash reduction performance goals set forth in the North Carolina Governor’s Highway Safety Program Highway Safety Plan (Highway Safety Plan; Figure 2).

In 2016, the Institute for Transportation Research and Education (ITRE) at North Carolina State University attended several Fatal Crash Reviews around the state and examined the impact of the Fatal Crash



Unbelted Collisions by Time of Day / Day of Week

Time Year: Calendar 2016, County LEL Regions: 4

Measures, Accident Day of...	All	00 - 01	02 - 03	04 - 05	06 - 07	08 - 09	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23
Unbelted Collisions	745	51	26	34	53	52	69	64	96	108	66	60	66
All	129	28	9	11	8	4	11	9	12	14	9	5	9
Sunday	98	1	3	2	11	12	9	10	13	11	11	9	6
Monday	92	2	3	1	8	8	9	11	15	16	6	8	5
Tuesday	104	3	2	5	9	11	9	10	12	15	8	9	11
Wednesday	82	2	2	2	5	4	6	9	13	15	10	6	8
Thursday	132	7	1	7	8	7	16	8	23	18	12	10	15
Friday	108	8	6	6	4	6	9	7	8	19	10	13	12
Saturday													

Figure 1. Example of NC Vision Zero data visualization.

	Year to Date	Year to Date
	Year-to-Date Fatalities	Year-to-Date Target and Status
Fatalities	408	293.8 <span style="color:red">◆</span> 39%
Alcohol-impaired Fatalities	102	72.32 <span style="color:red">◆</span> 41%
Unrestrained Fatalities	103	68.85 <span style="color:red">◆</span> 50%
Speed-related Fatalities	85	54.45 <span style="color:red">◆</span> 56%
Young Drivers (16-20) Involved in Fatal Crashes	41	39.6 <span style="color:orange">▲</span> 4%
Motorcycle Fatalities	41	37.6 <span style="color:orange">▲</span> 9%
Older Drivers (65+) Involved in Fatal Crashes	93	60.96 <span style="color:red">◆</span> 53%
Pedestrian Fatalities	109	66.08 <span style="color:red">◆</span> 65%
Pedalcyclist Fatalities	4	6.72 <span style="color:green">●</span> -40%

Figure 2. Example of NCVZA Scorecard.

1 <http://www.towardzerodeaths.org/>

2 The Crash Reconstruction Team is a smaller group of troopers that are specially trained to handle complex investigations involving criminal cases or high-profile crashes.

Review on the investigation process following a fatal collision in North Carolina. This article focuses on the organizational standards of data collection and the utilization of data for crash prevention in the NCSHP.

### **The Fatal Crash Review Process**

The purpose of the Fatal Crash Review is to closely examine the causal chain leading up to a fatal crash and explore solutions to prevent a similar crash from occurring again. Detailed investigation and discussion orients troopers to general trends in fatal crashes as well as specific details for each crash. At each NCSHP Fatal Crash Review, troops and districts discuss the NCVZA Scorecard, which outlines the number of fatalities in their area from that time period (Figure 2). These numbers are compared to fatalities from the previous year and the crash reduction goals from the North Carolina Highway Safety Plan are also reviewed. Progress on goals is represented with the color green, yellow, or red, as shown in Figure 2. The troop's overall report is followed by a similar process from each district within the troops.

Central to these discussions are not simply the comparison of numbers but the connection between specific enforcement activities (e.g., seat belt citations) and safety categories (e.g., fatal crashes). If there are apparent trends or patterns, the troopers may discuss future plans for efforts to increase enforcement for particular behaviors. For example, if a district had an increase in impaired driving deaths, they may decide to expand the number of DWI checkpoints in the next quarter. Additionally, individual fatal crashes are also discussed.

Typically, the investigating trooper leads the discussion, describing the factors that led to the collision and any relevant background information about the driver(s) or circumstances. During the investigation summary, other attendees may ask questions or offer ideas, which often leads to a dynamic interaction that allows for multiple ideas and perspectives about opportunities for improvement. At the end of the district presentations, a member of command staff discusses the top contributing circumstances for the troop fatalities as a whole and summarizes key findings.

### **Results: Shifting the Approach and Culture of Traffic Investigations**

To evaluate the impact of the Fatal Crash Review, NCSHP troopers were invited to participate in an anonymous, online survey. The survey asked troopers to describe how the Fatal Crash Review has changed the expectations and process of crash investigation, report on the response from troop members, and provide any details or examples of improved procedures. Seventy troopers, including members of the Crash Reconstruction Team, provided feedback on the formal quarterly reviews. According to the survey, the Fatal Crash Review has led to substantial improvements in the investigation process following a deadly collision in North Carolina, including:

#### **1. High Quality Data and Investigative Processes**

The Fatal Crash Review has led to a significant shift in the collection and reporting of data from the scene of a fatal collision in North Carolina. In the past, for every deadly crash, the investigating trooper completed a detailed report, known as a "fatal packet," on all of the circumstances of the crash. While the fatal packet has always documented key information on vehicles, drives, and passengers, the advent of the Fatal Crash Review has significantly increased the level of detail and information collected in these reports.

Many new items are now routinely collected in the fatal crash investigations, including tire depth and pressure, cell phone records, Crash Data Retrieval (CDR) downloads from the car's Event Data Recorder (EDR), signage placement, skid marks, and vehicle dimensions. As one trooper explained, "we look outside the normal scope of the collision scene investigation. Now, we can use different types of evidence, such as video cameras from stores, gas stations, banks, etc." The investigator will also search for items inside the vehicle, which may be relevant to distraction or state of mind, such as tablet computers or prescriptions.

These additional details may provide more in-depth insight into the factors that contributed to the crash. For example, in one investigation involving a single vehicle that ran off the road, the extra time spent checking tire conditions revealed that the vehicle of the deceased driver had four different tire brands with four different pressures and sizes. As one sergeant explained, in the past, fatal crash reporting answered the question "How did the crash occur?" The quarterly Fatal Crash Reviews now require the NCSHP to answer the question "Why did the crash occur?" in their investigations.

The investigating troopers are also now expected to piece together the sequence of events leading to the fatal crash. Broadening the scope of examination, investigators look at driver history, medical information, state of mind, and any relevant events that occurred 24 hours prior to the collision. For example, as one trooper stated, "If there was a chance that the person fell asleep and ran off the road, if we find out they had just pulled a double shift at work, this helps us understand that they may have fallen asleep."

Additional details with a high-quality investigation help to complete the causal chain, which can reveal all of the contributing factors that can be dealt with to prevent future crashes. Noting details such as road design and characteristics or sign placement and visibility can also help NCDOT discover any deficiencies on the road that could be fixed with repair or engineering solutions.

The fatal packets and formal crash review process have also created greater uniformity of data. Districts are required to use a template for the Fatal Crash Review presentation to ensure that the discussion covers similar information. The standardization of information helps to reveal common trends and patterns. As one trooper explained, "No matter if it's a single car collision or a multi-vehicle collision with the at-fault driver deceased, the same process is being utilized on each investigation."

## 2. Data-driven Efforts

Reviewing all troop fatalities each quarter with colleagues allows for the discovery of important trends in behavior and roadway design to guide future planning of enforcement efforts. If common factors are revealed, the NCSHP can adjust to meet changing needs in their area and determine optimal resource allocation and strategies for future enforcement efforts.

Behavioral insights revealed during the formal review can also be used to direct educational campaigns specific to local communities. For example, one district investigated a crash involving an unrestrained, alcohol-impaired driver who ran off the road, killing himself and a passenger. Before the formal review began, the investigation may have ended with reporting the crash. Instead, the trooper went back to talk to the victims' friends and family to find out what happened before the crash. In this case, upon further investigation, it was discovered that the two deceased came from a nearby party. Some friends had tried, unsuccessfully, to prevent them from leaving the party impaired. This information answered cultural questions that went beyond the scope of a checklist on a crash report and can be used in future traffic safety initiatives. To prevent similar crashes, local driver's education programs can focus on educating and empowering friends and family to intervene and effectively prevent impaired people from driving while intoxicated.

In some cases, trends discovered during the Fatal Crash Review may have larger implications in the state. In-depth examination of deadly crashes revealed that 40 percent of fatalities involved a recently suspended driver in the state. This information influenced the North Carolina General Assembly's action on Senate Bill 588 and House Bill 338, both which propose stricter penalties for driving without a valid license in North Carolina.<sup>3,4</sup>

## 3. Multi-Agency Collaboration

The Fatal Crash Reviews are designed to provide a place for interaction between members of the NCSHP and other agencies. Representatives from NCDOT attend the review to evaluate potential roadway design concerns that may be remedied through engineering solutions. For example, in an investigation discussion, it was discovered that a tree stump on a curve along a rural highway had contributed to the severity of multiple crashes. Upon learning this information, an NCDOT representative announced future plans to remove the stump. The presence of the Reconstruction Team at the Fatal Crash Review has also helped to spread awareness of their capabilities and equipment. As one Reconstruction team member said, they "have been able to assist the troopers with additional techniques/suggestions and provide tools to assist in their investigations."

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<sup>3</sup> See General Assembly of North Carolina. (2015, March 30). Senate Bill 588. Retrieved from <http://www.ncleg.net/Sessions/2015/Bills/Senate/PDF/S588v1.pdf>

<sup>4</sup> See General Assembly of North Carolina. (2015, March 25). House Bill 338. Retrieved from <http://www.ncleg.net/Sessions/2015/Bills/House/PDF/H338v3.pdf>

## 4. Peer Interaction and Accountability

During the review, troopers of all ranks are encouraged to ask questions, offer suggestions, and share experiences as their peers present investigations. This synergistic interaction allows for inter-district participation, collaboration, and peer accountability. Through the investigation presentations, troopers may learn about new methods or techniques and learn from the experience of other troopers. For example, in one review, following the presentation of a fatal crash involving a distracted driver, several members of the group exchanged advice on how to obtain a warrant to download cell phone data.

The pressure of presenting and justifying an investigation to peers and supervisors also creates an additional level of accountability. As one trooper said, "I ensure that accuracy is of the utmost importance; especially since other officers are looking at my report."

## 5. Shift in Organizational Culture

As the NCSHP troopers have adapted to new expectations and goals for fatal crash investigations, a shift has occurred in the organizational culture across the state. High expectations of crash investigation have changed the professional standards that the Highway Patrol identifies with as a core characteristic across all the troops. The Highway Patrol organizational culture goes beyond an expanded checklist of procedures to follow by placing value on high-quality investigations and data-driven decisions. Additional inquiry is praised and encouraged when troopers investigate beyond the crash scene to collect any information that may be relevant to the timeline.

## Concluding Thoughts

Coordinating formal Fatal Crash Reviews with multiple agencies allows for greater collaboration for developing data-driven solutions to prevent motor vehicle crashes. Not only can trends discovered in fatal reviews be used to guide future traffic safety campaigns and enforcement activities, but heightened expectations of detailed data and investigations have resulted in cultural shifts in highway patrol. Providing a time and place for troopers to communicate, share, and learn from each other has also raised standards of accountability and teamwork within the state. Overall, the formal review process has improved the quality of investigation in preventing roadway deaths and injuries. The fatal review ensures that "every stone must be overturned," as one trooper described.

## Acknowledgements

The authors would like to thank the North Carolina State Highway Patrol for its contribution to this research. The authors would also like to thank the North Carolina Governor's Highway Safety Program (GHSP) and its director, Mark Ezzell, for their leadership in supporting NC Vision Zero.

# Using Data to Inform Pretrial Supervision: Strategies from Allegheny County, Pennsylvania

BY JANICE RADOVICK DEAN AND KATHRYN COLLINS

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*Kathryn Collins, PhD, is the Fifth Judicial District's manager of research and quality assurance.*



Janice Radovick Dean



Kathryn Collins

More than 60 percent of people in jails across the country are not sentenced to the jail but merely awaiting resolution of their cases (Subramanian et al., 2015). However, many of these people could be safely released with the appropriate supervision. The release decision is made by a judicial officer, who is tasked with assigning the conditions of release that will “reasonably assure” public safety and appearance at subsequent court hearings. Pretrial services agencies perform two critical functions in support of this process. They provide validated risk assessment information for judicial officers to make their decisions and they provide monitoring and supervision strategies to mitigate pretrial risk of people released.

To date, there has been extensive research and evidence around the creation and validation of risk assessments at the pretrial stage. However, there has been limited rigorous research about what release conditions and amount of supervision mitigate this risk. In Allegheny County, Pennsylvania, we are using data-driven decision-making and tools to inform this process and to improve the effectiveness of pretrial supervision.

## What We Know

Though recent years have seen an abundance of research related to pretrial risk assessments, there have been few studies about what works in pretrial supervision. The studies that do exist often examine specific conditions or interventions rather than supervision as a whole. For example, studies to date have concluded that court-date reminder notifications can be effective at reducing a defendant's failure to appear in court; that drug testing as a condition of pretrial release does not reduce pretrial failure; and that the use of electronic monitoring in pretrial might reduce unnecessary detention (see VanNostrand et al., 2011).

Recent research has also suggested that the benefit of pretrial supervision is more pronounced for higher risk people (Lowenkamp & VanNostrand, 2013). Thus, pretrial supervision should be individualized and based on each person's risk level and circumstances. Using “blanket conditions,” mandatory requirements imposed on all people, or “one-size-fits-all” approaches can violate

constitutional rights and undercut the goal of pretrial justice. However, little is known about how and in what ways to supervise people during the pretrial phase. Some studies have linked certain conditions to a person's likelihood of court appearance, but few, if any, conditions of release appear to be related to a defendant's likelihood of re-arrest while on pretrial release. The quantity and quality of pretrial research as it relates to pretrial supervision result in an inability to make strong conclusions about the impact of pretrial release conditions (Bechtel et al., 2017).

The primary mechanism used by pretrial service agencies to monitor and supervise release conditions may include face-to-face contacts, home contacts, telephone contacts, collateral contacts, court reminders, and criminal history checks. Practices vary widely from jurisdiction to jurisdiction with no standard across the nation in terms of the frequency and type of contacts for people under pretrial supervision (VanNostrand et al., 2011). In addition, some pretrial agencies provide the same level of supervision regardless of the risk posed (as determined by a pretrial risk assessment). The lack of standardization across jurisdictions makes it difficult to define what pretrial supervision is and what practices are most effective at ensuring people appear for court and do not commit additional crimes pending resolution of their case. While recent studies have suggested that supervision generally results in increased pretrial success when compared to defendants released without supervision (Austin et al., 1985; Goldkamp & White, 2006), much more knowledge is needed.

## Allegheny County Pretrial Services

Allegheny County Pretrial Services (ACPTS) was created in 2007 as a stand-alone agency in the Fifth Judicial District of Pennsylvania, which is located in Western Pennsylvania and contains the city of Pittsburgh. In addition to other tasks, ACPTS conducts risk assessments on all people arrested and brought to the Allegheny

County jail and provides supervision for people ordered by a judicial authority. In 2007, ACPTS locally validated a pretrial risk assessment tool and began using it to assess the roughly 17,000 people who are taken to the jail pretrial every year. The assessment unit operates 24 hours a day, year-round, and people are typically arraigned within 6 to 12 hours of arrest. In 2016 ACPTS implemented a re-validated risk assessment, which now provides two risk scores—one for new criminal activity and one for failure to appear. Using those scores, ACPTS created a matrix of recommended levels of supervision (Figure 1).

	NCA 1	NCA 2	NCA 3	NCA 4	NCA 5	NCA 6
FTA 1	ROR	ROR	ROR	Report by Phone	Report in person	No release
FTA 2	ROR	ROR	ROR	Report by Phone	Report in person	No release
FTA 3	ROR	ROR	Report by Phone	Report in person	Report in person	No release
FTA 4	Report by Phone	Report by Phone	Report in person	Report in person	Report in person	No release
FTA 5	Report by Phone	Report by Phone	Report in person	Report in person	Report in person	No release
FTA 6	Report by Phone	Report by Phone	Report in person	Report in person	Report in person	No release

Figure 1. Matrix for levels of supervision.

The agency also defined what each level of supervision entailed so to best use limited resources to improve court appearance rates and to reduce new arrests during the pretrial stage. These levels included:

- **ROR (Low)**—a release on your own recognizance. This bond has no imposed court conditions but the defendant is required to appear at all court proceedings.
- **Report by Phone (Medium-Low)**—a nonmonetary bond that requires defendants to report by phone every two weeks to an automated call in system.
- **Report in Person (Medium-High)**—a nonmonetary bond that requires the defendant to report in person the first business day upon release.
- **No Release (High)**—Pretrial Services cannot recommend release for this defendant.

In 2015 a court reminder system was created, sending text, email, or phone reminders two days prior to their next hearing to all people with upcoming hearings in criminal court. This process has decreased failure-to-appear rates across all pretrial hearing types. ACPTS also created an automated phone-in process for all people identified as "medium-low risk" and who were ordered to pretrial supervision by a judicial officer. For all people in this group, they are required to call-in to an automated service every two weeks and answer questions (e.g., Do you know when your next court date is?). Pretrial services staff follow-up with each person who requires additional assistance or information about the court process.

Pretrial services also has the ability to supervise people under pretrial electronic monitoring (EM). On any given day, less than 3 percent of people under supervision are on EM, but this process does allow for people to be released from jail when they otherwise might not have been. People under EM supervision are monitored 24/7 and are assigned to an officer who sees them at least once a week at their home, treatment, or work.

### In-Person Reporting

For those deemed medium-to-high risk, ACPTS uses existing legal and evidence-based (albeit limited research is available) practices. We also use data-driven strategies to determine the most effective use of resources in supervising people in person with the ultimate goal of reducing failures to appear at court hearings or new arrests during their pretrial phase. More than half of the people under supervision by ACPTS are required to report in person (about 1,300 people).

Initially, each person is required to report every two weeks. During their first report, a supervision officer explains what pretrial supervision is, what is expected from the defendant, verifies contact information, reminds the person of their next court date, discusses any other court-ordered conditions, and answers questions. The Court has given ACPTS the ability to reduce supervision based on compliance—on-time reporting results in reduction of frequency of reporting from every two weeks to monthly or only on court dates.

Using these practices as a starting point, in 2017 we created dashboards that monitor supervision and reporting. The dashboards are updated nightly and pull directly from ACPTS's case management system. The dashboards are accessible by all pretrial services staff to encourage transparency and accountability. Upper-level management uses this information to inform practice and policy around supervision and to help guide future decision-making. The information is discussed during staff meetings and during one-on-one meetings with supervision staff in pretrial services.

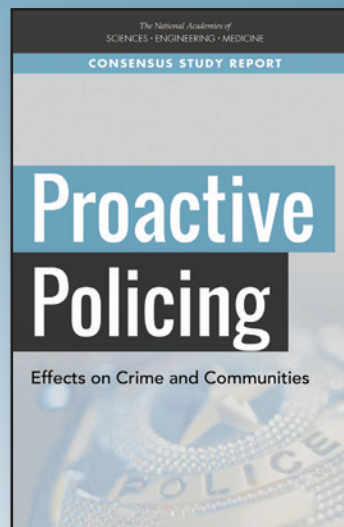
Importantly, the leadership of ACPTS is committed to using data to drive decision-making, particularly in an area with little national research to help guide practice. Using analytics, ACPTS found that, though people who reported once had lower rates of pretrial failure than those who did not report, the frequency of reporting had very little impact on new criminal activity. In particular, the data shows that requiring a person to report more than three times during pretrial release had no significant effect on new criminal activity. In addition, the majority of people who get re-arrested during pretrial in Allegheny County do so in the first 60 days after their preliminary arraignment.

*Continued on Page 23*

# DEVELOPING, DEFINING, AND MEASURING PROACTIVE POLICING PRACTICES

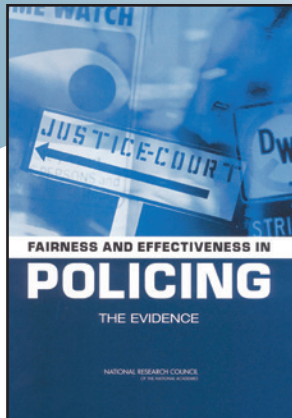
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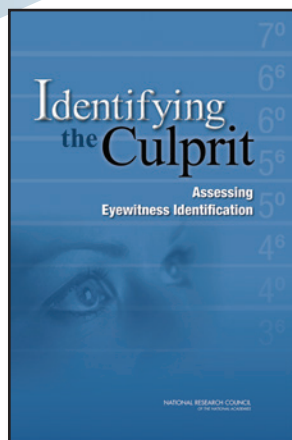
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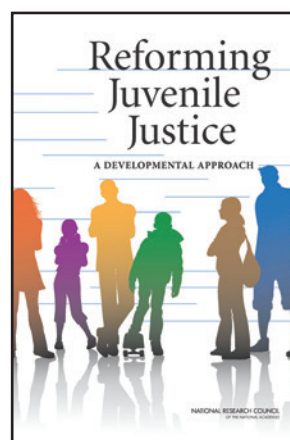
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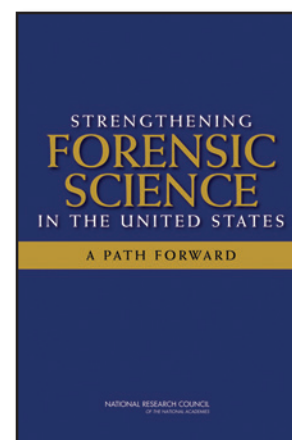
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# The Importance of Statistical Power in Social and Behavioral Sciences

BY NILOOFAR RAMEZANI

*Niloofer Ramezani is an assistant professor in the Department of Statistics at George Mason University and specializes in longitudinal and multilevel modeling, power analysis, survival analysis, and missing data techniques.*

Designing cost-effective criminal justice evaluations with high statistical power and at the same time minimum sample size are important goals in obtaining valid results. Power analysis, therefore is an essential component of evaluation research, although not always understood or carried out well.

The power of a statistical test can be taken to be the probability of obtaining statistically significant results when testing a false null hypothesis against a specific alternative hypothesis. In layperson terms, power is the chance that a proposed study will detect an effect that is present in the population of interest. We plan for high-powered evaluation designs to reduce the possibility of accidentally believing that a nonexistent effect is real or not being able to capture a significant effect when it exists. Statistical power depends on the sample size, significance criterion, type of test, and the population effect size among other things.

While power is sometimes inappropriately reported at the conclusion of a study, it is best calculated at the planning stages of designing an experiment or evaluation. This is because power is used to select what sample size is needed to ensure that an effect will be detected if there is one. Usually there is no formula for the power of different tests, but power can be estimated for different values of sample size; based on the preferred value of the power, the minimum sample size can be chosen.

Power calculations are important in social and behavioral sciences,<sup>1</sup> and especially in applied research that dominates criminal justice evaluation research. Not only is it important for researchers to come up with the correct sample size they need to perform a hypothesis test and make inferences, but it is also important, for budgetary reasons, that they don't have an unnecessarily large sample.

If a researcher doesn't collect enough data, this can result in deceptive research findings, and an inability to answer research questions. On the other hand, collecting too much data will result in time and resources wasted, often for minimal gain.

Despite the importance of statistical power in evaluation research, many studies do not explicitly mention or conduct power analysis. For example, in a recent study presented at the Joint Statistical Meetings conference in 2017, my colleagues and I conducted a



Niloofer Ramezani

systematic review of 200 articles from 32 high-impact education research journals from 2015 and 2016.<sup>2</sup> These studies ran the gamut of longitudinal education research and included evaluations related to academic achievement, social emotional learning, teaching and pedagogy, and educational psychology. Among these articles, power was rarely addressed; 87.2 percent of the reviewed articles did not even discuss statistical power at all. Such omissions are likely common in criminal justice research as well.<sup>3</sup>

Statistical power analysis for longitudinal studies is particularly of high importance due to the extensive use of longitudinal models in criminological work. This type of power calculation is challenging because of multiple time points per subject in a study and the dependence that exists among repeated measurements. This in turn makes power calculations and the determination of sample size more complicated than with cross-sectional data.<sup>4</sup> Fewer techniques exist for the power analysis of longitudinal data and all the existing tools are limited to having time-independent covariates. Covariates also often change over time, making existing models less efficient. In Ramezani (2017; see fn. 4), I developed two approaches based on generalized method of moments, to help applied researchers calculate the required sample size and the optimal power for the longitudinal studies in the presence of time-dependent covariates. However, more research and new tools to extend existing power estimation techniques are needed for applied researchers to effectively and efficiently choose the appropriate sample sizes for their studies.

1 See discussions by Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155.

2 Ramezani, N., Duck, K., Brown, A., Floren, M., Hinerman, K., & Lalonde, T., Joint Statistics Meetings conference. *Longitudinal modeling in applied research: Implications for improving practice*. August 2017, Baltimore, MD.

3 Brown, Stephen E., (1989), Statistical power and criminal justice research, *Journal of Criminal Justice*, 17, issue 2, p. 115-122.

4 Ramezani, N. (2017), *Power and sample size calculation of longitudinal data in the presence of time-dependent covariates using generalized method of moments*, PhD Dissertation. University of Northern Colorado, ProQuest Dissertations Publishing, 10618728.



Continued from Page 11

### A Note about Intimate Partner Homicides and Mass Shootings

Fifty-four percent of all mass shootings, defined as a shooting in which four or more people are killed, involve domestic or family violence (Everytown for Gun Safety, 2017). A common scenario is that of an ex-husband or ex-boyfriend shooting his former partner, children, and anyone else present, including himself. Even mass shooters who do not target intimate partners and family members often have histories of domestic violence, as has been revealed in many recent mass shootings. While mass shootings are rare events compared to all intimate partner homicides and firearm homicides that do not involve intimates, the tragedy of these events is extreme. The question “What can we do to prevent mass shootings?” is often asked and is too often met with silence. Keeping guns out of the hands of domestic violence perpetrators known to the justice system is a concrete strategy with the potential to prevent some mass shootings.

To view the full article that describes these results, see Zeoli, A. M., McCourt, A., Buggs, S., Frattaroli, S., Lilley, D., & Webster, D. W. (2017). Analysis of the strength of legal firearms restrictions for perpetrators of domestic violence and their associations with intimate partner homicide. *American Journal of Epidemiology*. Online first Nov. 29, 2017. doi: 10.1093/aje/kwx362

### References

- Campbell, J. C., Webster, D., Koziol-McLain, J., Block, C., Campbell, D., Curry, M. A., ... Laughon, K. (2003). Risk factors for femicide in abusive relationships: Results from a multisite case control study. *American Journal of Public Health, 93*(7), 1089-1097.
- Everytown for Gun Safety. (2017). *Mass shootings in the United States: 2009-2016*. Retrieved from [https://everytownresearch.org/wp-content/uploads/2017/04/Analysis\\_of\\_Mass\\_Shooting\\_062117.pdf](https://everytownresearch.org/wp-content/uploads/2017/04/Analysis_of_Mass_Shooting_062117.pdf)
- Fox, J. A., & Fridel, E. E. (2017). Gender differences in patterns and trends in U.S. homicide, 1976-2015. *Violence and Gender, 4*(2), 37-43.
- Vigdor, E. R., & Mercy, J. A. (2006). Do laws restricting access to firearms by domestic violence offenders prevent intimate partner homicide? *Evaluation Review, 30*(3), 313-346.
- Wintemute, G. J., Frattaroli, S., Claire, B. E., Vittes, K. A., & Webster, D. W. (2014). Identifying armed respondents to domestic violence restraining orders and recovering their firearms: Process evaluation of an initiative in California. *American Journal of Public Health, 104*(2), E113-E118.
- Zeoli, A. M., McCourt, A., Buggs, S., Frattaroli, S., Lilley, D., & Webster, D. W. (2017). Analysis of the strength of legal firearms restrictions for perpetrators of domestic violence and their associations with intimate partner homicide. *American Journal of Epidemiology*. doi: 10.1093/aje/kwx362
- Zeoli, A. M., & Webster, D. W. (2010). Effects of domestic violence policies, alcohol taxes and police staffing levels on intimate partner homicide in large U.S. cities. *Injury Prevention, 16*(2), 90-95.

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As a result of this analysis, ACPTS is piloting a new strategy of supervision for people required to report in person. After two months of reporting, if they reported as directed, their reporting requirements are reduced to reporting on court dates only. This results in a 56 percent reduction in the time a person is actively supervised by pretrial if they are in compliance. The result of this is a reduction in the amount people are required to report, which in turn allows pretrial supervision officers more time to devote to higher risk individuals

### Future Directions

As pretrial supervision becomes more evidence-based, data-driven tools and dashboards can support these efforts. Not only does this require leadership commitment and judicial collaboration, but also support from researchers on how to best adjust these processes in the future. These types of approaches can provide communities and individuals awaiting hearings with safe and cost-effective options through an engaged and informed pretrial processes.

### References

- Austin, J., Krisberg, B., & Litsky, P. (1985). The effectiveness of supervised pretrial release. *Crime & Delinquency, 31*(1), 519.
- Bechtel, K., Holsinger, A. M., Lowenkamp, C. T., & Warren, M. J. (2017). A meta-analytic review of pretrial research: Risk assessment, bond type, and interventions. *American Journal of Criminal Justice, 42*(2), 443-467.
- Goldkamp, J. S., & White, M. D. (2006). Restoring accountability in pretrial release: The Philadelphia pretrial release supervision experiments. *Journal of Experimental Criminology, 2*, 143.
- Lowenkamp, C., & VanNostrand, M. (2013, November). Exploring the impact of supervision on pretrial outcomes. Arnold Foundation.
- Subramanian, R., Delaney, R., Roberts, S., Fishman, N., & McGarry, P. (2015, February). *Incarceration's front door: The misuse of jails in America*. Vera Institute of Justice.
- VanNostrand, M., Rose, K. J., & Weibrecht, K. (2011, June). *State of the science of pretrial release recommendations and supervision*. Crime and Justice Institute at Community Resources for Justice.



## In Memoriam: Jeffrey A. Roth (1945-2017)

The Center for Evidence-Based Crime Policy was saddened to learn of the recent passing of Dr. Jeffrey A. Roth. Jeff was a valued colleague, mentor, and friend to several of us in the CEBCP family and many others in the field of criminology. Jeff was an economist who devoted his career to the study of crime and justice issues. Over several decades, he worked at the National Academies of Sciences, the Urban Institute, the University of Pennsylvania, the U.S. Sentencing Commission, and a number of other research organizations.

Jeff is perhaps best known for his leadership and work on landmark National Academies of Sciences reports on understanding and preventing violence (1993), taxpayer compliance (1989), and criminal careers and career criminals (1986). Jeff also led numerous program evaluation studies in the justice field, including highly prominent national evaluations of the federal Community Oriented Policing Services (COPS) program and the 1994 federal assault weapons ban that he led for the U.S. Congress and the U.S. Department of Justice.

Jeff was a careful, meticulous, and creative scholar who took a comprehensive and balanced approach to his work. Practitioners, policymakers, and funders knew they could count on him to take on tough and controversial issues and deliver informative, thorough, and fair results. Jeff served his field and our society admirably, and his work continues to shape research and policy in crime and justice. Young scholars he mentored now carry on his legacy in academia, government, and the nonprofit sector.

Just as significant as his professional accomplishments were Jeff's qualities as a person. Simply put, Jeff was one of the best people one could hope to know and emulate. He had a genuinely moving effect on others. Colleagues and friends have described him as someone who was exceptionally kind and gracious, welcoming, humble in his accomplishments, and positive in his outlook. He was a patient teacher and mentor who generously gave his younger colleagues opportunities to take prominent roles on challenging and high-profile studies. He was also steadfast and selfless in his devotion to his wife, Charlotte Kerr, as he cared for her during her struggle with a long illness. Personally and professionally, he was a role model to many. Knowing and working with Jeff made many of us better scholars and, more importantly, better people. We will miss him.

*Written by Christopher Koper, with thanks to several of Jeff's friends and colleagues who shared kind sentiments and remembrances (William Adams, Jeffrey Butts, Reagan Daly, Steven Edwards, Ted Gest, Charlotte Gill, Calvin Johnson, Cynthia Lum, John MacDonald, Lois Mock, Lisa Newmark, Laurie Robinson, Caterina and John Roman, William Sabol, Mary Shelley, Larry Sherman, Jeremy Travis, Christy Visser, David Weisburd, Charles Wellford, and Daniel Woods).*

# Hot Off the Press

- Braga, A. A., Weisburd, D., & Turchan, B. (2018). Focused deterrence strategies and crime control: An updated systematic review and meta-analysis of the empirical evidence. *Criminology and Public Policy*, 17(1), 205-250.
- Gill, C., Wooditch, A., & Weisburd, D. (2017). Testing the “law of crime concentration at place” in a suburban setting: Implications for research and practice. *Journal of Quantitative Criminology*, 33(3), 519-545.
- Gill, C., Weisburd, D., Vitter, Z., Gross Shader, C., Nelson-Zagar, T., & Spain, L. (Forthcoming). Collaborative problem-solving at youth crime hot spots: A pilot study. *Policing: An International Journal*.
- Han, W., & Redlich, A. D. (2018). Racial/ethnic disparities in community behavioral health service usage: A comparison of mental health and traditional court defendants. *Criminal Justice and Behavior*, 45, 173-194.
- Hsu, M-Y., & Yang, S-M. (2017). Preventing police officers’ drunk driving from rational choice’s perspectives. *Journal of Substance Abuse Research*, 2(3), 63-89. (Taiwan)
- Kochel, T., & Weisburd, D. (2017). Assessing community consequences of implementing hot spots policing in residential areas: Findings from a randomized field trial. *Journal of Experimental Criminology*, 13, 143-170.
- Koper, C. S., Johnson, W. D., Stesin, K., & Egge, J. (2018, February 24). Gunshot victimizations resulting from high-volume gunfire incidents in Minneapolis: Findings and policy implications. *Injury Prevention*, doi: 10.1136/injuryprev-2017-042635.
- Koper, C. S., Johnson, W. D., Nichols, J. L., Ayers, A., & Mullins, N. (2017). Criminal use of assault weapons and high capacity semiautomatic firearms: An updated examination of local and national sources. *Journal of Urban Health*, doi: 10.1007/s11524-017-0205-7.
- Koper, C.S., & Lum, C. (2017). Place-based policing. In N. Fyfe (Ed.), *Policing 2026: Evidence review*. Report commissioned for Police Scotland/Scottish Police Authority. Dundee, Scotland: Scottish Institute for Policing Research. [http://www.sipr.ac.uk/downloads/Policing\\_2026\\_Evidence\\_Review.pdf](http://www.sipr.ac.uk/downloads/Policing_2026_Evidence_Review.pdf)
- Lin, J., & Yang, S-M. (2017). An application of ecological analysis on the longitudinal association between burglary and sexual assault. *Criminology*, 20(1), 1-28. (Taiwan)
- Lum, C., & Koper, C.S. (2017). *Evidence-based policing: Translating research into practice*. Oxford, UK: Oxford University Press.
- Lum, C., Koper, C.dS., Johnson, W., Stoltz, M., Wu, X., & Carr, J. (2017, August). Measuring police proactivity. *The Police Chief*, 16-17.
- Lum, C., & Vovak, H. (In press). Variability in the use of misdemeanor arrests by police agencies from 1990 to 2013: An application of group-based trajectory modeling. *Criminal Justice Policy Review*.
- Mitchell, R. J., Telep, C. W., & Lum, C. (2017). *The ten-step guide for conducting in-house experimental evaluations*. Fairfax, VA: Center for Evidence-Based Crime Policy, George Mason University.
- Olaghere, A., & Lum, C. (In Press). Classifying “micro” routine activities of street level drug transactions. *Journal of Research in Crime and Delinquency*.
- Owens, E., Weisburd, D., Alpert, A., & Amendola, K. (2018). Can you build a better cop? Experimental evidence on supervision, training, and policing in the community. *Criminology and Public Policy*. doi: 10.1111/1745-9133.12337
- Perry, G., Jonathan-Zamir, T., & Weisburd, D. (2017). The effect of paramilitary protest policing on protestors’ trust in the police: The case of the “Occupy Israel” movement. *Law and Society Review*, 51(3), 602-634.
- Redlich, A. D., Bibas, S., Edkins, V., & Madon, S. (2017). The psychology of defendant plea decision-making. *American Psychologist*, 72, 339-352.
- Telep, C. W., & Weisburd, D. (2018). The criminology of places. In G. Bruinsma & S. Johnson (Eds.), *The Oxford handbook of environmental criminology* (pp. 583–603). New York: Oxford University Press.
- Weisburd, D. (2017). Proactive policing and crime control. *Nature Human Behavior* 1, 707–708.
- Weisburd, D. (2018). Vollmer Award Address: Hot spots of crime and place-based prevention. *Criminology and Public Policy*, 17(1), 5-25.
- Weisburd, D., & Eck, J. (Eds.). (2017). *Unraveling the crime-place connection: New directions in theory and policy*. Series on Advances in Criminological Theory. New York: Routledge.
- Weisburd, D., & Hasisi, B. (Forthcoming). The winding road to evidence-based policy in corrections: A case study of the Israeli prison service. *Israel Law Review*.
- Weisburd, D., & Wire, S. (2018). Crime Hot Spots. *Oxford Research Encyclopedia of Criminology and Criminal Justice*.
- Weisburd, D., & Majmundar, M. (Eds.). (also cited as National Academies of Sciences, Engineering, and Medicine). (2017). *Proactive policing: Effects on crime and communities*. Washington, DC: The National Academies Press.
- Weisburd, D., Hasisi, B., Shoham, E., Aviv, G., & Haviv, N. (2017). Reinforcing the impacts of work release on prisoner recidivism: The importance of integrative interventions. *Journal of Experimental Criminology*, 13(2), 241–264.
- Weisburd, D., Shay, M., Amram, S., & Zamir, R. (2017) The relationship between social disorganization and crime at the micro geographic level: Findings from Tel Aviv-Yafo using Israeli census data. *Advances in Criminological Theory*, 22, 97-120.
- Willis, J. J., & Mastrofski, S. D. (2017). Contrôler l’autonomie policière par un équilibre des forces: Le cas des caméras portées (Controlling police through a balance of forces: The case of body cameras). *Cahiers de la Sécurité et de la Justice*, 40, 90-102.
- Yang, S-M., & Jen, I-C. (2017). An evaluation of displacement and diffusion effects on eco-terrorist activities after police interventions. *Journal of Quantitative Criminology*. doi: 10.1007/s10940-017-9367-4.



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