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GPS Supervision in California: One Technology, Two Contrasting Goals

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Say "No" to Gangs

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From the Start

Magneto-Optical Sensors
Bring Obliterated Serial
Numbers Back to Life

An Inside Look at Creating
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Social Science Research on Forensic
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Research Designs in the Real
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of an IPV Intervention

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810 Seventh St. N.W.
Washington, DC 20531

Loretta E. Lynch

Attorney General

Karol V. Mason

Assistant Attorney General

Nancy Rodriguez, Ph.D.

Director, National Institute of Justice

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National Institute of Justice
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202-307-2942



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Nancy Rodriguez, Ph.D.

Director, National Institute of Justice

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Contact Us

jolene.hernon@usdoj.gov

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DIRECTOR'S MESSAGE



What an honor to write my first message for NIJ's flagship publication!

It was solicitation season when I was sworn in as Director in early February, so I hit the ground running. President Barack Obama had just released his 2016 budget; a couple of weeks later, the Task Force on 21st Century Policing released its report; and two weeks after that, the National Initiative for Building Community Trust and Justice announced its first six sites, which NIJ is supporting. Arriving at such a busy time offered me the perfect vantage point to see how seamlessly some of my goals tie into the Institute's work. My first and primary goal is to lead with the science — to strengthen science to advance justice. There are many ways to do this, but here are three that came to mind as I read this issue of the *NIJ Journal*:

- I intend to support young scientists who are motivated and eager to respond to criminal justice issues; in that regard, I'm proud to publish the article by Dr. Alison Brooks Martin, a former NIJ Graduate Research Fellow, on the importance of planning for a program evaluation.
- Dr. Katharine Browning's article on how forensic science and social science work in tandem illustrates how to leverage the brainpower and creativity of NIJ's own scientists and work across our science offices. I have started working with several of NIJ's scientists to flesh out ways in which we can leverage our in-house expertise and conduct intramural research activities.
- Jim Dawson's article about research to uncover obliterated serial numbers on firearms used in the commission of a crime offers an example of another goal of mine, which is to ensure that we take full advantage of expert analysis and recommendations, such as the assessment of NIJ's forensic sciences R&D portfolio now being conducted by the National Academies. Their final report is due later this year.

I will continue to support partnerships, both internally (within NIJ and the Office of Justice Programs) and externally, through our researcher-practitioner grants, for example. However, another way to form stronger external partnerships is through cooperative agreements. Because NIJ wants to be a true partner with those we fund — and also leverage our own scientists' expertise in producing rigorous science — I will be looking for ways to increase the Institute's use of cooperative agreements. See page 23 for a brief snapshot of the difference between grants and cooperative agreements; more guidance can be found on NIJ.gov.

Of course, I am always looking for ways to capture the impact of our investments. My commitment as NIJ Director is to ensure that our investments advance science, are translated into useful knowledge for our stakeholders, and have an impact on policy and practice. And because I believe that true innovation happens when people with different views come together, I intend to use my leadership to foster greater diversity throughout the many components of NIJ's work. As I get to know my new colleagues here at NIJ, they are hearing me ask the question, "Who is missing from the conversation?" I like to see diversity in perspectives, disciplinary backgrounds, race and ethnicity — and I want to ensure that NIJ engages with groups and agencies that, like us, are committed to reducing the number of people disproportionately involved in the criminal justice system.

I hope you enjoy this issue of the *NIJ Journal*. I believe this issue includes something for everyone in our diverse audience of practitioners, researchers and policymakers.

A handwritten signature in black ink that reads "Nancy Rodriguez". The signature is fluid and cursive, with a large initial "N" and a stylized "R".

Nancy Rodriguez, Ph.D.

Director, National Institute of Justice

The National Institute of Justice is the research, development and evaluation agency of the U.S. Department of Justice. NIJ's mission is to advance scientific research, development and evaluation to enhance the administration of justice and public safety.

The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance; the Bureau of Justice Statistics; the Office for Victims of Crime; the Office of Juvenile Justice and Delinquency Prevention; and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking (SMART).

Photo Sources: Thinkstock; iStock; Getty Images; Johnson County Criminalistics Laboratory, Kansas; George Drake, NLECTC-Technology Center of Excellence; Robert Walker, Jr., Palladian Partners, Inc.; Sam English.

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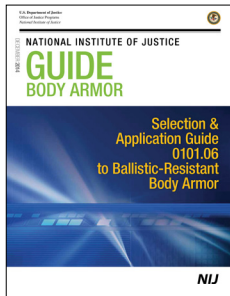
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NIJ BULLETIN



Publications in Brief



Selection and Application Guide to Ballistic-Resistant Body Armor

NIJ has released *Selection and Application Guide to Ballistic-Resistant Body Armor*, which summarizes NIJ-funded and other research on body armor conducted during the past 13 years. This guide provides law enforcement, correctional and public safety officers with a better understanding of how body armor works and how it complies with the NIJ standard. It also provides guidance on purchasing and maintenance policies for NIJ-compliant body armor.

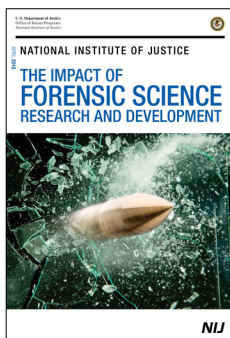
Read more at NIJ.gov, keyword: 247281.



New Perspectives E-Publication

The first 12 papers from the NIJ and Harvard Executive Session on Policing and Public Safety are now available for e-readers. The Executive Sessions brought together police chiefs and researchers from across the country to develop concepts that could revolutionize policing and resolve current law enforcement issues. This first volume includes papers on police professionalism and leadership, the role of police in prisoner reentry, and making policing more affordable. The second volume is anticipated in early 2016.

Download the e-publication at NIJ.gov, keywords: new perspectives volume 1.



The Impact of Forensic Science Research and Development

Innovations from forensic science research and development have produced new and improved techniques that increase the reliability and efficiency of criminal investigations and forensic testing. A new brochure outlines how NIJ's investment in forensic science research and development, from validating the accuracy of firearms examiners to developing technology to identify illegal drugs, helps improve public safety and criminal justice outcomes by giving law enforcement and forensic scientists tools and procedures that work more efficiently and accurately.

Read the brochure at NIJ.gov, keyword: 248572.

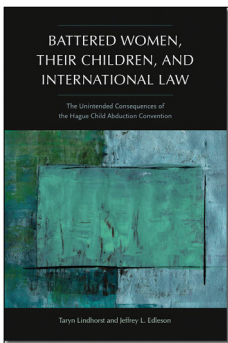


News & Events



NIJ Receives Two 2015 Blue Pencil Awards

Two NIJ publications won awards at the 2015 National Association of Government Communicators Blue Pencil & Gold Screen Awards competition. In this peer-reviewed competition that recognizes the best in federal, state and local communications, the *NIJ Journal* received an Award of Excellence in the “Magazine” category. *Mending Justice: Sentinel Event Reviews*, a special report that explores the potential to learn from errors in the criminal justice system by applying a sentinel event review approach, received a second-place award in the “Special Purpose Publication” category.

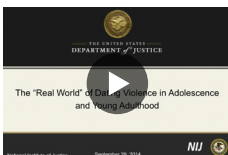


Taryn Lindhorst and Jeffrey L. Edleson Receive 2015 Society for Social Work and Research Book Award

Congratulations to NIJ-supported researchers Taryn Lindhorst and Jeffrey L. Edleson, who have received the 2015 Society for Social Work and Research Book Award for *Battered Women, Their Children and International Law: The Unintended Consequences of the Hague Child Abduction Convention*. The book is based on their research into the experiences of female victims of domestic violence who are seeking safety in the U.S. only to have their children ordered to be returned to the country from which they fled.



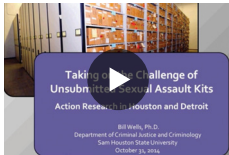
Multimedia



The “Real World” of Dating Violence

In a *Research for the Real World* seminar, Peggy C. Giordano shares preliminary findings from a longitudinal study on the nature of teen dating relationships and risk factors for dating violence. The findings challenge traditional assumptions about gender in early relationships and how youth deal with disagreement. Conflict concerning financial issues, infidelity and time spent with peers are risk factors for violence among young adults. Giordano stresses that developing a more nuanced view of anger, control and communication could provide opportunities to change patterns of violence in relationships.

Watch the seminar at NIJ.gov, keywords: real world of dating violence.



Taking on the Challenge of Unsubmitted Sexual Assault Kits

In “Taking on the Challenge of Unsubmitted Sexual Assault Kits,” experts from Detroit and Houston discuss the issues with which they grappled when processing and testing large numbers of sexual assault kits that had never been sent to the lab. These NIJ-funded projects brought together police, prosecutors, victims, victim-support providers and researchers to explore why so many unsubmitted sexual assault kits accumulated and to make recommendations on how best to notify victims and change policy and practice to prevent future buildups of kits.

Watch the webinar at NIJ.gov, keywords: expert chats.



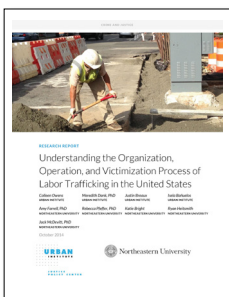
Recent Research Findings



Natural Experiment in Reform: Analyzing Drug Policy Change in New York City

In 2009, New York state lawmakers passed legislation to reform the Rockefeller Drug Laws, removing mandatory minimum sentences for a range of felony drug offenses and expanding eligibility for treatment as an alternative to incarceration. An NIJ-funded study by the Vera Institute of Justice examined the impact these reforms had on felony drug cases in New York City. Findings showed a 35 percent increase in the number of defendants sent to treatment, which was associated with lower rates of re-arrest, and a decrease in the number of defendants sentenced to jail, time served and “split sentences” (a combination of jail and probation). However, implementation varied widely across boroughs, and the majority of drug arrests did not lead to diversion to treatment.

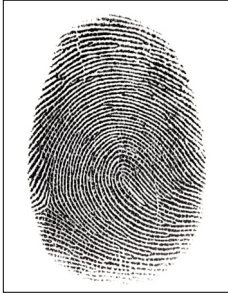
Read the report at NIJ.gov, keyword: 248524.



Understanding the Organization, Operation and Victimization Process of Labor Trafficking in the United States

Researchers at the Urban Institute and Northeastern University who explored patterns of labor trafficking in the U.S. found that trafficking occurs in multiple industries, including agriculture, hospitality, construction and restaurants. Labor trafficking is not limited to unauthorized workers; 72 percent of the sample entered the U.S. on a temporary visa, and the threat of removing that immigration status was the traffickers’ primary tool for coercing labor. The report outlines policy and practice implications for federal and local law enforcement and victims’ services agencies.

Read the report at NIJ.gov, keyword: 248461.



Miami-Dade Research Study for the Reliability of the ACE-V Process: Accuracy and Precision in Latent Fingerprint Examinations

Researchers working with the Miami-Dade Police Department tested the accuracy and reliability of decisions made by latent fingerprint examiners. The researchers presented examiners with comparison challenges of varying degrees of difficulty and used the Analysis, Comparison and Evaluation (ACE) procedure to make decisions. A verification (ACE-V) stage was added to measure how often individual examiners repeated their own decisions and how often different examiners came to the same conclusion, including under biasing conditions. Results showed that even when examiners did not get an independent second opinion about their decisions, they were remarkably accurate. When an independent reviewer verified decisions, examiners had a 0 percent false-positive (incorrect identification) rate and a 3 percent false-negative (missed identification) rate.

Read the report at NIJ.gov, keyword: 248534.



New NIJ.gov Pages



Research on Body-Worn Cameras

More jurisdictions than ever are having their law enforcement officers use body-worn cameras. But what do we know from research about how these cameras affect police and citizen behavior? How does department policy influence implementation, and what are the best approaches for addressing privacy concerns?

To date, limited research is available to help law enforcement executives decide whether and how to implement body-worn cameras in their jurisdictions.

To help improve our nation's knowledge base, NIJ is currently funding two studies on body-worn cameras: a CNA Corporation study of the impact of body-worn cameras in the Las Vegas Metro Police Department and a Los Angeles Police Foundation evaluation of body-worn video technology in the Los Angeles Police Department.

Learn more about this ongoing research and read the market surveys of body-worn camera technology at NIJ.gov, keywords: body worn cameras.



Art by Sam English.

Violence Against Indian Women National Baseline Study

NIJ's Tribal Study of Public Safety and Public Health Issues Facing American Indian and Alaska Native Women — also referred to as the National Baseline Study (NBS) — is the first nationally representative study of American Indian (AI) and Alaska Native (AN) women living in Indian Country and AN villages.

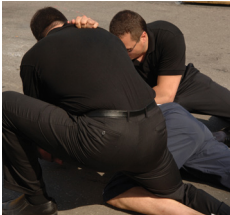
Researchers will interview AI and AN women to learn about their experiences with violence and victimization, health and wellness, community crime, service needs, and help-seeking behaviors and outcomes as well as their opinions about public safety. Ultimately, the NBS is expected to:

- Produce a deeper understanding of the public safety issues facing adult women living in AI communities and AN villages.
- Quantify the magnitude of violence and victimization in tribal communities to gain a better understanding of service and resource needs.
- Provide accurate data that can be used to create public policies and prevention and intervention strategies to decrease violence against AI and AN women.
- Evaluate the response to violence against AI and AN women by all levels of government.

Learn more about this ongoing study and NIJ's Violence Against AI and AN Women portfolio at [NIJ.gov](https://www.nij.gov), keywords: national baseline study.



Research Updates



Police Use of Force

NIJ has funded research on police use of force for more than two decades. The Institute is currently funding a Seattle University study on the validity and reliability of national data on citizen complaints about police use of force. See details about this ongoing research, find a list of all research related to use of force, and read summaries of some recent use-of-force studies, including the role of conducted energy devices (such as the Taser), at [NIJ.gov](https://www.nij.gov), keywords: use of force.



Unsubmitted Evidence in Sexual Assault Cases

To better understand the issue of unsubmitted sexual assault kits, NIJ awarded action research grants to the Houston Police Department and the Wayne County (Detroit), Michigan, Prosecutor's Office. The overarching goals of these projects were to understand the scope of the issue (how many unsubmitted kits are there, and how and why did the problem develop?) and then identify effective, sustainable responses, including conducting a census of the kits, creating a testing plan, notifying victims, and improving system processes and collaboration among organizations. Learn what the research teams found at [NIJ.gov](https://www.nij.gov), keywords: unsubmitted SAKs.



Elder Abuse

Recent NIJ-funded research sheds light on the extent of elder mistreatment in residential care facilities. The research also offers insight into the effectiveness of a multidisciplinary team intervention in addressing elder abuse and seeks to determine the nature and extent of consumer fraud victimization among community-residing elders. Visit the updated elder abuse pages at NIJ.gov, keywords: elder abuse.



Sharing Data to Improve Science



Data Resources Program

Secondary data analysis allows researchers to build on existing findings, replicate results and conduct new analyses. Through NIJ's Data Resources Program, data collected as part of NIJ research are archived in the National Archive of Criminal Justice Data and made available to support new research aimed at reproducing original findings, replicating results and testing new hypotheses.

Learn about NIJ's Data Resources Program at NIJ.gov, keyword: DRP.

Recent data sets added to the National Archive include the following:

- Anti-Terror Lessons of American Muslim Communities in Buffalo, New York; Houston, Texas; Raleigh-Durham, North Carolina; and Seattle, Washington; 2008-2009
- Estimating Human Trafficking Into the United States [Phase I: Development of a Methodology]
- Evaluation of Camera Use to Prevent Crime in Commuter Parking Facilities Within the Washington Metro Area Transit Authority Parking Facilities, 2004-2009
- Evaluation of CeaseFire, a Chicago-Based Violence Prevention Program, 1991-2007
- Evaluation of the Bureau of Justice Assistance's Indian Alcohol and Substance Abuse Demonstration Programs, 2002-2006
- Investigation and Prosecution of Homicide Cases in the United States, 1995-2000: The Process for Federal Involvement
- Outcome Evaluation of the Comprehensive Indian Resources for Community and Law Enforcement (CIRCLE) Project With Data From Nine Tribes in the United States, 1995-2004
- Participatory Evaluation of the Sisseton Wahpeton Oyate Indian Alcohol and Substance Abuse Program Demonstration Project in the United States, 2006-2007
- Protective Behaviors of Student Victims of Bullying: A Rare Events Analysis of the 2009 School Crime Supplement to the National Crime Victimization Survey

Learn about accessing and using research data from NIJ studies at NIJ.gov, keywords: using data resources.



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DO NOT OIL

GPS SUPERVISION IN CALIFORNIA: ONE TECHNOLOGY, TWO CONTRASTING GOALS

BY STEPHEN GIES

Two NIJ-supported studies with very different results show that GPS technology may be used to help prevent crime in various ways.

Using sophisticated technology to control crime generally appeals to both the public and policymakers, because it prompts visions of reduced crime and improved safety. GPS technology can track an offender's movements in real time and is designed to reduce crime by enhancing the likelihood that law enforcement will detect criminal behavior. For the public, this conveys the notion of a virtual prison, in which offenders are prohibited from engaging in any wrongdoing. Critics, on the other hand, maintain that the idea of pervasive and constant surveillance offers a false sense of security and does little to actually prevent crime; they often point to horrific crimes that have occurred while offenders were under GPS supervision.¹

Despite the absence of solid evidence for either position, the potential benefits outweighed the criticism and spurred many communities across the country to invest in GPS supervision equipment in the mid-to-late 2000s. Among these were two California counties that initiated programs that were structurally similar but conceptually quite different. The California Department of Corrections and Rehabilitation (CDCR) began a pilot program in San Diego in July 2005 to

test the use of GPS technology as a deterrent for high-risk sex offenders on parole. Parole agents had generally positive experiences with the sex offender monitoring program, which prompted CDCR to expand the program across the state.

Meanwhile, interest grew in applying the same technology to address the state's serious gang problem. In March 2006, CDCR partnered with the city of San Bernardino to implement a 20-unit pilot project using GPS supervision for gang offenders. In May 2007, then-Gov. Arnold Schwarzenegger expanded the pilot program, adding 20 units each to Fresno, Los Angeles, Riverside and Sacramento.

The growing interest in using GPS technology as a supervision tool, coupled with the dearth of existing research and continued advancements in the technology, prompted NIJ to fund methodologically similar yet distinct evaluations of the two California programs. The goal was to understand whether GPS supervision would work with one or more offender groups and, if not, why not.

Opposite page:
Example of a one-piece
offender tracking device
that uses GPS and other
technologies to monitor
a person's location.*

The sex offender study² used a quasi-experimental design to compare 258 sex offenders receiving traditional parole supervision with 258 sex offenders receiving GPS supervision. The study looked at two main outcomes: noncompliance (measured by violations of parole) and recidivism (measured by re-arrest, reconviction and return to prison). The researchers found that offenders who received traditional parole supervision were three times as likely to commit a sex-related violation as those who received the GPS supervision. In terms of recidivism, offenders who received traditional supervision were twice as likely to be arrested as those who received the GPS monitoring supervision. Overall, these findings were consistent with most of the recent research, which has found the deterrent value of GPS technology.³

In a thought-provoking twist, however, the gang study⁴ offered very different findings from those of the sex offender study, despite having a geographically similar population and a program that operated under almost parallel procedures with the exact same hardware (see Figure 1). In this study, researchers looked at a group of gang offenders who were released from prison and residing in California:

392 offenders receiving GPS supervision and 392 offenders receiving traditional parole supervision. Again, the researchers examined two main outcomes: noncompliance⁵ and recidivism. In contrast to the sex offenders, however, the odds of a technical violation were 36 percent greater among the gang offenders on GPS supervision, and the odds of a nontechnical violation were 20 percent greater. Conversely, the GPS group was less likely than the traditional supervised group to be re-arrested overall (the chance of being re-arrested was 26 percent lower). (CrimeSolutions.gov rates California’s GPS supervision program for gangs as “promising.” For more information, go to CrimeSolutions.gov, keywords: California gps supervision.)

At first glance, these contradictory findings may confirm many criticisms leveled at GPS and give corrections personnel pause when considering the use of GPS to supervise gang offenders. Moreover, the lack of consistent findings from the two studies draws into question the universal utility of GPS as a supervision tool. However, if we look closely at the purpose, goals and operating procedures of each program, we find quite a different story.

Figure 1. Studies of GPS Supervision in California

	Sex Offenders		Gangs	
	Traditional <i>n</i> = 258	GPS <i>n</i> = 258	Traditional <i>n</i> = 392	GPS <i>n</i> = 392
Noncompliance	<div> <div> 3X more likely to commit sex-related violation </div> </div>	<div> <div>Less likely</div> </div>	<div> <div>Less likely</div> </div>	<div> <div> 36% more likely to receive technical violation </div> </div>
Recidivism	<div> <div> 2X more likely to be arrested </div> </div>	<div> <div>Less likely</div> </div>	<div> <div>More likely</div> </div>	<div> <div> 26% less likely to be rearrested </div> </div>

Table 1. Characteristics of Sex Offender and Gang Offender Parole Supervision Programs

Program Characteristics	Sex Offender Program	Gang Offender Program
Design		
Strategy	Deterrence/rehabilitation	Focused deterrence
Goal	Return to community	Remove from community
GPS type	Active and passive	Active
Duration	Length of parole period	Intermittent (as needed)
Caseload	20 high/40 passive	20
Eligibility	Static-99 risk assessment instrument	Gang attribute assessment criteria
Infrastructure		
Equipment	Single piece	Single piece
Monitoring model	Vendor operated	Vendor operated
Notification system	Yes	Yes
Supervision Specifications		
Subject matter training	Yes (sex offender)	No
Offender orientation	Yes	Yes
Drug testing	If applicable	Mandatory
Supervision specifications	More contacts per month	Fewer contacts per month
Integrated with traditional parole	Yes	Yes
Treatment option	Yes	No

Using GPS in California

GPS technology is a global navigation satellite system that provides location and time information, in all weather, anywhere on or near the Earth. Initially developed in 1973 as a military application, the system today is freely accessible to anyone with a GPS receiver. In corrections, GPS technology is used to track the real-time movement of a wide variety of offenders (e.g., drunk drivers, gang offenders,

domestic violence offenders) within different criminal justice contexts (pre-adjudication, dispositional and post-release).⁶

In California, the Department of Adult Parole Operations uses GPS to monitor both paroled high-risk gang offenders and sex offenders. As shown in Table 1, although the two programs are discrete, they do have some similarities. For instance, rather than offering GPS as a standalone practice, both

programs integrate GPS technology into an overall supervision program. As a result, both programs have two distinct components: GPS monitoring and traditional intensive supervision.

The GPS monitoring component uses an active system — meaning that a data point is taken every minute and transmitted nearly in real time — that combines cellular and GPS technology to automatically track a parolee's location. The tracking device is a single-piece GPS unit that weighs about 6 ounces and is roughly the size of a computer mouse. Offenders wear the device flush around the left ankle; specialized screws secure a tamper-resistant, fiber-optic technology strap to the device.

The software system tracks information about parolee activities and transmits it to a monitoring center. The monitoring center then provides the supervising parole agent with information in two basic forms: daily summary reports (DSRs) and immediate alert (IA) notifications. The agent receives an emailed DSR for each parolee every morning detailing all activity recorded by the GPS unit, including charging activity, zone violations, strap tampers and other violations. The agent must review all recorded activity and note any follow-up actions. The DSR also includes a direct link to a Web-based data system, which allows an agent to review an offender's movement patterns. When the GPS unit records specific types of violations, an IA notification is generated automatically and transmitted via text message to the supervising agent. The supervising agent must then analyze and respond appropriately to the information.

The GPS monitoring technology in California's sex and gang offender programs also includes:

- **Inclusion zones:** Locations that an offender must occupy during certain times of the day.
- **Exclusion zones:** Locations that an offender is prohibited from entering at all or during certain times of the day.

- **Crime scene correlation:** The intersection of crime incident data with GPS tracks to determine whether an offender was in the vicinity of a crime.

The intensive supervision component involves more traditional, recurrent physical contact: The agent meets face to face with the parolee and other collateral contacts on a regular basis. It also includes a drug-testing element if applicable.

Several critical differences exist between the two programs, however, and these differences likely drive the divergent outcomes. The first difference is that the sex offender program includes a treatment component, which requires parolees to attend weekly sex offender treatment classes in which clinicians provide psychological evaluations, assessments, and individual and group therapy. Notably, the gang offender program does not include a treatment requirement. The reason for its absence is simple and offers the second major difference between the programs: The operational goals of the two programs differ markedly. The goal of the sex offender program is to use GPS technology to gather information that can enhance supervision, heighten the certainty of treatment and discourage future crime; the goal of the California gang program — as for many other gang programs — is to remove individual gang members from the community by quickly identifying violations, enforcing strict revocation rules and returning the offenders to prison.⁷ The findings from the two studies suggest that GPS can be used for either purpose with relatively equal efficiency.

Policy Implications

GPS has garnered an increasing amount of attention in recent years. The use of GPS technology as a supervision tool is in vogue in contemporary criminal justice systems and is still growing in popularity. In fact, most jurisdictions throughout the Western world have some form of electronic monitoring to supervise offenders.⁸

The findings from the California studies are important because they suggest that GPS technology might serve multiple crime prevention purposes, depending on a program's goals and structural design. Specifically, GPS can be used as a traditional deterrent mechanism, a focused deterrent tactic or a treatment enhancement provision.

Traditional deterrence: Deterrence is based on the notion that all behavior results from rational calculations of cost versus reward and that to prevent crime, the costs must outweigh the expected rewards.⁹ In general, deterrence suggests that if we increase the certainty, severity and swiftness of criminal justice sanctions, we could prevent crime.¹⁰ With these principles in mind, it is easy to appreciate how the use of GPS might increase the certainty — and possibly the swiftness — of punishment. GPS's intensified supervision likely enhances the probability that law enforcement will detect parole violations and criminal behavior, and the location data obtained by GPS systems presumably increase the speed in apprehension, which in turn might result in more rapid punishment. The use of GPS also might increase the severity of punishment: It can strengthen confidence in evidence that points to an offender's guilt of a post-release violation or crime, resulting in stricter penalties.

Moreover, GPS monitoring has an advantage over other deterrence-based programs in that it offers much broader supervision. Unlike traditional intensive supervision programs that simply increase contact between the parole agent and the offender, GPS technology offers continuous monitoring, creating an almost omniscient supervision presence that hinders all criminal activity. This type of unyielding supervision, further enhanced by a digital record of the offender's whereabouts, might tip the scale in a criminal's decision of whether to commit an illegal act.

Focused deterrence: Deterrence suggests that we could prevent crime if an offender perceives that the costs of committing the crime outweigh the benefits. Focused deterrence is a similar threat

sanction approach used by criminal justice officials, but it differs in that it specifically warns high-risk offenders about the sanctions for re-offense — that is, that police, prosecutors or probation officers will “pull every available lever” to maximize punishment.¹¹ Thus, again, GPS may be used to increase certainty, swiftness and severity, but parole agents can also closely monitor an offender's movements and strictly enforce any violation through revocation. Moreover, parole agents, in conjunction with law enforcement, can use GPS to disrupt gang activity by holding in violation two or more monitored offenders who come within close proximity of one another and by investigating crimes via crime scene correlation software, which can intersect GPS tracks with location-based crime data and help identify potential suspects or observers. The latter tends to dissuade non-monitored offenders from associating with monitored gang members to avoid being exposed as an associate.

Rehabilitation: Rehabilitation focuses on reintegrating an offender back into society. A central component of the sex offender program is mandated treatment. Numerous treatment options are available for sex offenders, and although research on their effectiveness has produced mixed results, the majority point to positive benefits. For instance, a recent meta-analysis examined 69 outcome evaluations of sexual offender treatment, which comprised 80 independent comparisons between treated and untreated offenders. The analysis found that despite a wide range of positive and negative effects, the majority of studies confirmed the benefits of treatment.¹² Overall, treated offenders demonstrated 37 percent less sexual recidivism than offenders who did not receive treatment. The effects for violent and general recidivism were in a similar range.

Although it is still unclear what type of treatment is most effective,¹³ the research seems to agree that sex offenders who leave treatment before completion have an increased risk of recidivism.¹⁴ Given this finding, it is feasible that when integrated into a treatment

program, GPS monitoring might support rehabilitation efforts. The sense of omniscience that GPS engenders among offenders might encourage them to continue their specified treatment regimens. Under traditional parole supervision, an offender could haphazardly attend treatment and fabricate stories to explain missed appointments; however, GPS data greatly hinder this potential for subterfuge. In turn, increased and continued attendance in a treatment program might decrease the likelihood of criminal behavior.

A Multifaceted Tool

This review only touches briefly on how structural design and program goals factor in when bringing a GPS supervision program from conceptualization to reality. But perhaps the best way to think about GPS, given its multidimensional nature, is not as a program at all but as a multifaceted tool that can be configured in a number of ways to support varied criminal justice objectives.

About the Author

Stephen Gies is a senior researcher with Development Services Group, Inc. He conducted the NIJ-funded evaluations of the California Department of Corrections and Rehabilitation's programs for monitoring high-risk gang offenders and high-risk sex offenders using GPS technology.

For More Information

To read more about the California sex offender and gang studies, go to NIJ.gov, keywords: gps community evaluation.

*Photo taken by George Drake, subcontractor working for the University of Denver in support of the NLECTC – Corrections Technology Center of Excellence.

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NCJ 248778



HELPING AT-RISK YOUTH SAY “NO” TO GANGS

BY BRIAN HIGGINS

An NIJ-funded evaluation finds that a revised curriculum and greater attention to teacher training have resulted in an improved program for preventing gang membership and delinquency.

The Gang Resistance Education and Training (G.R.E.A.T.) program is teaching kids to avoid gang membership and helping them develop positive relationships with law enforcement, according to a recent national evaluation.

The program is designed to give at-risk youth the skills they need to resist pressure from gangs and avoid joining them. Results from a national evaluation conducted from 1995 to 2001 found that the program reduced several risk factors associated with gang membership and delinquency, but the evaluation found no differences between G.R.E.A.T. and non-G.R.E.A.T. youth in either gang membership or involvement in delinquent behavior.

Based on these findings, the curriculum was rewritten to emphasize classroom participation and skill-building exercises to address known risk factors for gang involvement. The new curriculum was piloted in 2001, with full-scale implementation in 2003. Results from the latest national evaluation show that the program was implemented as intended and that schools received it well. The evaluation also found that the new curriculum resulted in several improved outcomes.

Evaluating G.R.E.A.T.

G.R.E.A.T. is a gang and delinquency prevention program taught by law enforcement officers to middle school students across the United States and in several foreign countries. The program aims to help youth:

- Avoid gang membership.
- Avoid violence and criminal activity.
- Develop a positive relationship with law enforcement.

Created in 1991 by Phoenix-area law enforcement agencies, the program quickly spread throughout the United States.

In 2006, NIJ awarded funding to the University of Missouri—St. Louis to conduct a national evaluation of the revised G.R.E.A.T. program. The evaluators surveyed students attending 31 public middle schools in seven cities across the country. In each participating school, classrooms were randomly assigned to be taught or not taught the G.R.E.A.T. curriculum. Based on student responses, the evaluators examined how G.R.E.A.T. students differed from non-G.R.E.A.T. students in terms of delinquent activity and gang involvement. The evaluators also looked at how well the instructors taught the program.

How Teachers Were Evaluated

The evaluation team conducted several tasks to determine whether the Gang Resistance Education and Training (G.R.E.A.T.) course was being taught as designed. The team assessed fidelity by (1) watching G.R.E.A.T. officers teach, (2) observing officer training, (3) surveying and interviewing G.R.E.A.T.-trained officers and supervisors, and (4) surveying school personnel.

All instructors — be they school resource officers or law enforcement officers — must complete G.R.E.A.T. officer training and be certified before being assigned to teach the program. This training (one week for officers with teaching experience and two weeks for others) introduces officers to the program and covers gang trends, emphasizing prevention over enforcement; the developmental stages of middle school students; and teaching and classroom management techniques.

The Bureau of Justice Assistance, the agency responsible for operational control of G.R.E.A.T., trained a group of senior G.R.E.A.T. officers to observe classroom teaching. Evaluators observed 33 officers teaching the G.R.E.A.T. program in the 31 participating schools from September 2006 through May 2007. Each evaluator documented whether the instructor addressed each lesson component, the time spent on each component, how well the instructor engaged the students, whether activities were conducted as intended, and the overall quality of the lesson.

How Well Is G.R.E.A.T. Being Taught?

One key to the success of G.R.E.A.T. is qualified, well-trained instructors teaching the program faithfully to its goals. In school districts that have school resource officers (SROs), the SROs generally teach the G.R.E.A.T. program. In school districts that do not have SROs, law enforcement officers teach the program as part of community relations or on an overtime basis.

Of 33 instructors evaluated, 27 were judged to have taught with average or above average program fidelity. The best instructors provided examples from their own experiences without violating program fidelity. (See sidebar, “How Teachers Were Evaluated.”)

In addition to observing G.R.E.A.T. instructors in the classroom, evaluators observed eight G.R.E.A.T. officer trainings over two years, including six 40-hour sessions and two 80-hour sessions. The evaluation concluded that the training provided officers with enough knowledge and skills to teach the program effectively.

The evaluators also surveyed G.R.E.A.T.-trained officers at each study site and interviewed officers teaching the program in 25 of the 31 target schools and their supervisors. Approximately two-thirds of the officers who received surveys responded. Responses indicated that officers believed that G.R.E.A.T. can build partnerships among law enforcement officers, youth, schools and the community and that the lessons meet the program goals and convey the right amount of information. They named the lessons on goal-setting and decision-making among their favorites and the most effective.

Evaluators also surveyed classroom teachers and conducted periodic reviews with school districts to assess how they viewed the program and how it fit into other academic lessons. The school personnel who were surveyed generally supported school-based prevention programs. About four-fifths of survey respondents agreed that these kinds of programs could deter youth from drug use, delinquent behavior and gang involvement and that schools have a responsibility to prevent students from engaging in these behaviors. However,

fewer personnel reported that they would like to see more prevention programs in their schools (64 percent), and only 56 percent agreed that classroom teachers should incorporate prevention program lessons into their own teaching curricula.

Continuing Challenges

The evaluation revealed that G.R.E.A.T. instructors face several challenges, such as needing to shorten or skip lessons because of other school activities. Both the observations of program delivery and the school personnel surveys revealed that some G.R.E.A.T. officers had difficulties with classroom management and showing up to teach when scheduled. The evaluators noted that more attention to these issues in officer training, more participation of classroom teachers in G.R.E.A.T. lessons, and better communication between G.R.E.A.T. officers and teachers might address these deficiencies.

Most classroom teachers did not incorporate G.R.E.A.T. into standard lesson plans or use the associated teacher activities. Reasons given included lack of time, lack of relevance to other lessons, and teachers not knowing that additional G.R.E.A.T. activities were available. Incorporating G.R.E.A.T. in relevant subjects (e.g., health, social studies, language arts) might reinforce both G.R.E.A.T. lessons and standard class material. Improving officer-teacher communication also might help integrate G.R.E.A.T. into schools' curricula.

How Effective Is G.R.E.A.T.?

To assess program effectiveness, the evaluators compared survey responses from students in the G.R.E.A.T. classes to control students on 33 potential outcomes, including behavioral outcomes (e.g., gang affiliation, frequency and variety of general delinquency, involvement in illegal activity), and 28 attitudinal measures, including two measures of attitudes toward law enforcement and toward gangs. The questions also assessed key risk and protective factors associated with problem behaviors among youth.

The evaluators administered a pre-test and a one-year follow-up questionnaire to gauge short-term program effects as well as three additional annual surveys to gauge longer-term effects of the program. The evaluators found that statistically significant differences existed between students in the G.R.E.A.T. classes and control students on 14 of 33 outcomes one year after the students completed the G.R.E.A.T. lessons and that smaller but still significant effects on these outcomes continued to exist after four years.

In addition, several skills-building objectives appear to have been met, especially refusal skills. However, no statistically significant differences existed between the two groups of students on self-reported delinquency. These effects were all beneficial but modest. Although the other comparisons between the two groups were not statistically significant, all comparisons indicated more prosocial attitudes and behaviors among the

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The Gang Resistance Education and Training (G.R.E.A.T.) program is rated as “promising” on CrimeSolutions.gov. Past evaluations show that students who completed the G.R.E.A.T. program were 39 percent less likely to join a gang at the one-year follow-up than students who did not receive the program. G.R.E.A.T. students also reported a more positive opinion of law enforcement officers (statistically significant) and were better able to resist peer pressure, were less self-centered, and expressed less positive attitudes toward gangs than their peers did after one year. Visit CrimeSolutions.gov to learn more.

G.R.E.A.T. students. The findings suggest that most of the G.R.E.A.T. program’s benefits to high-risk students appear early on and fade over time.

Results of the school personnel survey were less promising: Only about half of the respondents agreed that the G.R.E.A.T. program significantly reduced youth’s gang participation in their schools and communities. This finding, however, is not inconsistent with the results of the student surveys. In the study schools, only half of the classes in one grade received the G.R.E.A.T. program. Evaluators noted that in schools in which almost all students, over time, receive G.R.E.A.T. training, one may expect to see less gang involvement.

The Impact of Evaluation

During the first national evaluation, many stakeholders collaborated to look critically at the G.R.E.A.T. program’s curriculum and how effectively officers were teaching the information. Their work led them to create, adopt and teach an improved curriculum that engaged students and enabled more of them to avoid gang membership, violence and criminal activity and helped them develop positive relationships with law enforcement officers.

The latest evaluation suggests that expanding the program to more classrooms, working more closely with classroom teachers and informing them about available G.R.E.A.T.-related activities, and integrating the G.R.E.A.T. curriculum into regular classroom lessons would allow G.R.E.A.T. to make an even greater contribution to preventing gang involvement and delinquency.

The two national evaluations and reactions to G.R.E.A.T. from school administrators, teachers, principals, students and law enforcement officers show a program that has learned from being evaluated. The revisions to the curriculum and greater attention to teacher training appear to have resulted in modest improvements to the G.R.E.A.T. program.

About the Author

Brian Higgins, a writer-editor with Lockheed Martin, recently passed away. He contributed significantly to a body of work produced through the National Criminal Justice Reference Service and available on NCJRS.gov.

For More Information

To learn more about G.R.E.A.T. and the two national evaluations of the program, go to NIJ.gov, keywords: gang research evaluation.

NCJ 248777

GRANTS AND COOPERATIVE AGREEMENTS — WHAT'S THE DIFFERENCE?

NIJ awards grants and cooperative agreements to support high-quality research. One key difference between the two is the level of interaction expected between NIJ and the award recipient. With a grant, the award recipient has a great deal of autonomy. Cooperative agreements are collaborative in nature, allowing NIJ to take full advantage of the expertise of the NIJ scientists who work with award recipients on innovative research.

Learn more about the key differences between these two funding options at [NIJ.gov](https://www.nij.gov), keywords: cooperative agreements.





PLAN FOR PROGRAM EVALUATION FROM THE START

BY ALISON BROOKS MARTIN

Having evaluation in mind when designing a program can help ensure the success of future evaluations.

One of the first tasks in gathering evidence about a program's successes and limitations (or failures) is to initiate an evaluation, a systematic assessment of the program's design, activities or outcomes. Evaluations can help funders and program managers make better judgments, improve effectiveness or make programming decisions.¹ Evaluations can describe how a program is operating, show whether it is working as intended, determine whether it has achieved its objectives and identify areas for improvement. (See sidebar, "CrimeSolutions.gov Rates Programs' Effectiveness.")

Having a plan for the evaluation is critical, and having it ready when the program launches is best.

Evaluation Plans

An evaluation plan outlines the evaluation's goals and purpose, the research questions, and information to be gathered. Ideally, program staff and an evaluator should develop the plan before the program starts, using a process that involves all relevant program stakeholders.

The benefits of an evaluation plan

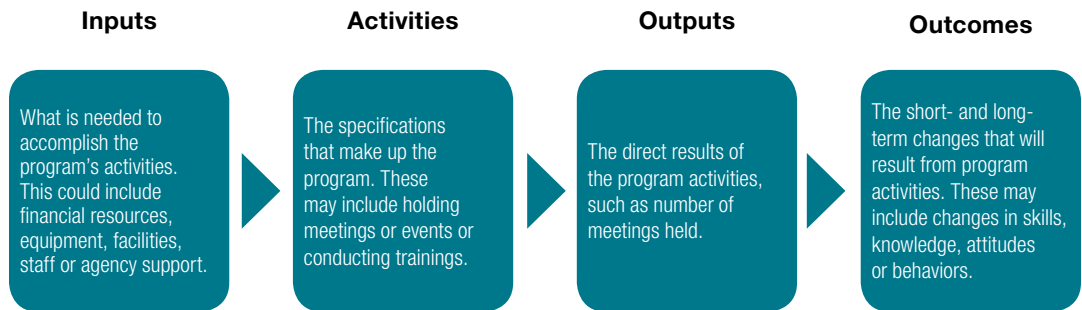
Having a plan helps ensure that future evaluations are feasible and instructive. Putting the plan in writing helps ensure that the process is transparent and that all stakeholders agree on the goals of both the program and the evaluation. It serves as a reference when questions arise about priorities, supports requests for program and evaluation funding, and informs new staff. An evaluation plan also can help stakeholders develop a realistic timeline for when the program will (or should) be ready for evaluation.

Creating an evaluation plan

Partners and stakeholders use evaluation plans to clarify a program's purpose, goals and objectives and to describe how program activities are linked to their intended effects. To this end, stakeholders should consider developing a logic model. A logic model visually depicts how a program is expected to work and achieve its goals, specifying the program's inputs, activities, outputs and outcomes (see Figure 1, "Sample Logic Model").

The evaluation plan should develop goals for future evaluations and questions these evaluations should answer. This information will drive decisions on what data will be needed and how to collect them.

Figure 1. Sample Logic Model



For example, stakeholders may be interested in the extent to which the program was implemented as planned. Determining that requires documentation on program design, program implementation, problems encountered, the targeted audience and actual participation. Alternatively, stakeholders might want to know the program's impact on participants and whether it achieved its objectives. In this case, program staff should plan to collect data before implementing the program so an evaluator later can assess any changes attributable to the program.

Types of evaluations

A program can benefit from multiple evaluations over the course of its design and implementation.

The type and timing of evaluations are important. Evaluation is more difficult and less meaningful after

the program ends, because stakeholders cannot use information gathered from the evaluation to alter the program's implementation or to justify continued funding. Conducting certain evaluations, like outcome evaluations, is difficult when a program is too new because program elements, strategies or procedures often still are being adjusted and finalized. Table 1 shows several common types of evaluations.

Plan for Evaluation From the Start

When designing a program, it is easy to focus only on the immediate decisions that must be made to implement the program and make it operational. But evaluating a program can be challenging or impossible if stakeholders do not plan for evaluation during initial program development. Having evaluation in mind when designing a program can help ensure the success of future evaluations.

Table 1. Common Types of Evaluations			
	Formative	Process	Impact or Outcome
Questions the type of evaluation can answer	<p>Is the program's implementation optimized for success?</p> <p>Is the program well developed?</p>	<p>How is the program operating, and in what context does it operate?</p> <p>Has the program been implemented as planned?</p> <p>How can the program's operation be improved?</p>	<p>Did the program reach its objectives?</p> <p>What impact did the program have on target outcomes?</p> <p>What long-term changes can be attributed to the program?</p>
When to use the type of evaluation	<p>During the planning stages or beginning of the program's implementation so revisions can be made before the program starts</p>	<p>In the early stages of the program's implementation to provide initial feedback</p>	<p>At the end of the program's development, when the program is stable and unlikely to change in fundamental ways</p>

Choose the questions you want to answer and know what information you need to answer them

Stakeholders need to know the questions they want an evaluation to answer and build the capacity to collect data to answer those questions. For example, if stakeholders want to know what changes resulted from the program, baseline data should be collected before the program begins. This is especially important if the evaluation will use surveys or interviews to assess baseline opinions or behaviors, because asking respondents later to recall prior opinions or behavior may produce biased results. By thinking this through in advance, stakeholders can ensure that they conduct any necessary pre-tests before the program begins and establish a method to collect data over the course of the program. Furthermore, planning for a future outcome evaluation — even if the immediate goal is a process evaluation — can be beneficial, because at some point, many stakeholders will want or need to answer the question “Does it work?” Partnering with an experienced evaluator can help stakeholders identify potential evaluation designs and decide how to collect the required data.

Determine the timing and resources needed

Stakeholders should consider the time and cost of an evaluation effort and build them into the evaluation plan. A general rule of thumb is to budget 10 percent of the total program cost for evaluation. Although completing a process evaluation may require only a few months, a large-scale outcome evaluation may require years and a substantial financial outlay. If stakeholders want the evaluation's results to help improve the program or justify continued funding, they need to make sure the evaluation is completed before the program is slated to end. This is particularly critical for programs that rely on grant funding, which are usually active only for a set period of time.

Document critical information

To help ensure that the evaluation is instructive and meaningful, program staff should document the program's design, purpose and objectives so that an evaluator can compare them to the program's actual

implementation. Without that documentation, an evaluation is unlikely to produce enough meaningful information to justify its cost and level of effort. Having an evaluation plan in place from the beginning with clear requirements for documentation can help ensure that the needed information is actually collected.

Remain flexible

Despite the best planning, stakeholders cannot anticipate all aspects of a program's operation before implementation, so an evaluation plan should be responsive to program changes and shifting priorities. As they get new information, stakeholders may find some goals unrealistic or some data impossible to collect, access or track. They should revise the evaluation plan as necessary and document each change, justification and decision point.

In turn, stakeholders should be aware that some evaluations, particularly outcome evaluations, might require staff to operate a program differently than usual to rigorously assess the program's effect. For example, evaluators might ask staff to refrain from altering the program's operation during the evaluation period or to select participants in a different manner, perhaps through a randomized process. Partnering with an evaluator in the early stages of program development and implementation can help program staff understand what may be required of them to successfully evaluate the program later.

Special Challenges in Evaluating Multisite Programs

Implementing and evaluating a multisite program can be challenging, especially when sites are given latitude to implement the program in ways that suit their specific needs, because goals and designs will vary by site.

When writing an evaluation plan, stakeholders must consider whether sites will be implementing the program uniformly or will have flexibility in their design. If each site has a different strategy, stakeholders need to take that diversity into consideration and note it in the evaluation plan. Each site should create its own documentation, including

CrimeSolutions.gov Rates Programs' Effectiveness

CrimeSolutions.gov uses the results of research evaluations to categorize programs and practices as “effective,” “promising,” or having “no effects.” To date, more than 300 programs and practices have been reviewed for their efficacy. Visit CrimeSolutions.gov to learn more.

a timeline and list of goals and objectives, and sites may require different evaluation strategies. Addressing differences across sites in the evaluation plan and monitoring their progress over time helps ensure that each site is fully operational and has the necessary data and functionality for future evaluations.

Evaluability Assessments

Programs without evaluation plans in place can experience significant challenges during evaluations. If a program does not have an evaluation plan, an evaluability assessment can help determine whether the program can be evaluated and whether an evaluation will produce useful results. A program with an evaluation plan also can benefit from an evaluability assessment, which can gauge how well the evaluation plan was put into action and its effectiveness in preparing the program for an evaluation.

An evaluability assessment analyzes a program's goals, state of implementation, data capacity and measurable outcomes. It can save valuable time and money if it shows that the program cannot be evaluated, because evaluability assessments cost significantly less than actual evaluations. The evaluability assessment also can provide stakeholders with valuable information on how to alter the program structure to support future evaluations.

Design It So It Can Be Evaluated

The key to developing a program that can be evaluated is to have the goal of future evaluation in mind when designing the program's documentation, goals and implementation. Stakeholders also must continually monitor the program's progress and verify that relevant data are being captured, particularly if the goal is to conduct an outcome

evaluation. Although evaluation is not always easy and can sometimes be an imposition to program operations, having an evaluation plan is invaluable to making such efforts as feasible and successful as possible. Program staff should, whenever possible, partner with a university, an experienced researcher or a sister science agency to help construct the plan. Having an evaluation plan in place will help ensure that future program evaluation is feasible and financially viable and that its results are instructive to program staff and stakeholders.

About the Author

Alison Brooks Martin was a postdoctoral research associate in NIJ's Office of Research and Evaluation from November 2013 until January 2015.

For More Information

Read a chapter by Finn-Aage Esbensen and Kristy N. Matsuda in *Changing Course: Preventing Gang Membership* to learn more about program evaluations and why having a well-designed evaluation is critical to determining a program's effectiveness. Visit NCJRS.gov, keyword: 243475.

Notes

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NCJ 248779

APPLY TO NIJ'S GRADUATE RESEARCH FELLOWSHIP PROGRAM

NIJ is accepting applications for Graduate Research Fellows. We are looking for outstanding graduate students who are studying issues that affect public safety, crime, and the fair and impartial administration of criminal justice in the United States.

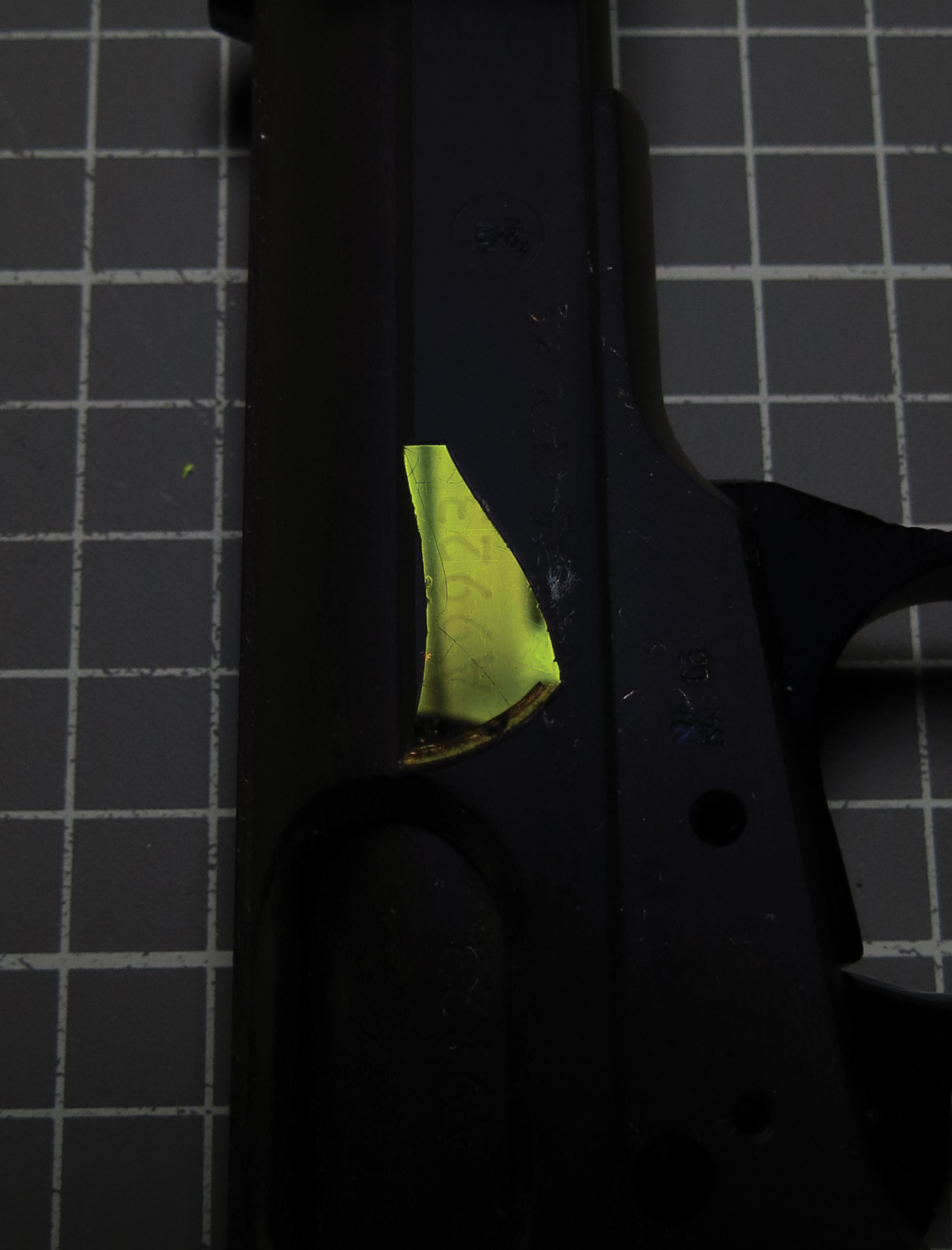
The NIJ Graduate Research Fellowship (GRF) program has two tracks:

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Learn more about the GRF program, read about experiences of past fellows and find out what present fellows are studying at NIJ.gov, keyword: GRF.





MAGNETO-OPTICAL SENSORS BRING OBLITERATED SERIAL NUMBERS BACK TO LIFE

BY JIM DAWSON

A sensor technology first developed for medical use is being adapted to detect and visualize destroyed serial numbers in firearms.

In the firearms section of the Johnson County Sheriff's Office Criminalistics Laboratory, located southwest of Kansas City, Kansas, firearms expert Jason Butell has spent many hours over the past two years destroying serial numbers on firearms and then trying to recover and read them. His work is key to an NIJ-supported research project to determine whether a new system that combines magnetic fields, polarized light and a special sensor is better than the traditional methods for recovering and reading obliterated serial numbers.

Thus far, Butell is pleased by what he sees. The new method uses magneto-optical (MO) sensor technology to nondestructively detect and visualize serial numbers that have been scratched, ground, chiseled or otherwise removed from firearms. Although the new system isn't perfect, compared with the nondestructive method currently used in most crime laboratories — magnetic particle inspection (MPI) — MO sensor technology, according to Butell, "[is] slightly more sensitive, sees a little deeper, is not as messy and requires a little less work."

Butell collaborates with Rudi Luyendijk of the Midwest Forensics Resource Center, part of the Department of Energy's Ames Laboratory in Ames, Iowa. Luyendijk, the principal investigator who began the MO project in 2011, has completed the first phase of research — testing the sensors on flat, smooth surfaces — and is now testing some of the 2,000 firearms in the Johnson County crime laboratory's reference library.

"We're currently doing phase two testing that is evaluating the use of the MO sensor on realistic samples, meaning firearms [recovered by law enforcement] on which the serial numbers have been obliterated," Luyendijk said. "We tried out this method on ideal test samples and saw that it had great potential for firearms that are made of magnetic materials," he explained, "so we moved to testing on actual firearms [recovered in criminal investigations]."

Both the MO sensor technology and the standard MPI methods use strong magnetic fields to reveal obliterated numbers, which requires that the firearms be magnetic. To reveal destroyed serial numbers on weapons made of nonmagnetic materials, such as

Opposite page:
A fragment from a magneto-optical sensor, originally developed for medical purposes, reveals an obliterated serial number on a gun when viewed through a polarized filter.*

Serial Numbers on Firearms

Firearms serial numbers became an important tool for tracing weapons with the enactment of the Gun Control Act of 1968, which requires that all newly manufactured firearms produced in, or imported into, the United States bear such a number. Possession of a firearm manufactured after 1968 with an obliterated serial number is illegal. For firearms imported or manufactured after January 30, 2002, the number must have a print size no smaller than one-sixteenth of an inch and be engraved, cast or stamped to a depth of at least 0.003 inches.¹

The research to develop magneto-optical sensor technology to assist law enforcement and crime laboratory personnel exemplifies NIJ's mission to advance scientific research, development and evaluation to enhance the administration of justice and public safety.

Notes

1. See 27 CFR 478.92 and 27 CFR 479.102.

zinc, aluminum or alloy substances, crime laboratories must still use chemical etching, a process that uses strong acids and typically reveals a serial number for only a few moments before possibly destroying it.

Whether it be MO, MPI or chemical etching, an obliterated serial number can often be recovered from a metal weapon because when a manufacturer stamps the serial number into the barrel or frame, the crystalline structure of the metal below the number is deformed and compacted. Because of the structural changes in the underlying metal, even when the visible serial number is filed or ground away, the material structure below retains the number.

The MO system "is more sensitive than any of the current methods for detecting serial numbers," Luyendijk said. It also can measure deeper than the grinding or scraping typically done to remove the numbers from firearms found on the street, he explained.

Using MO imaging on firearms is new, but the imaging system itself is not. It was developed for the medical imaging field, Luyendijk said, where it is used to determine how drugs (tagged with magnetic particles) disperse through a person's body. The system is also

used in the aircraft industry to search for small cracks in older airframes.

Revealing a visually unreadable serial number with MO sensor technology, he said, is straightforward and quick. Strong magnets are held against a firearm, and a waferlike sensor that includes MO and mirrored layers is placed directly over an obliterated serial number. Polarized light is passed through the sensor and — based on what is known as the Faraday effect — reflected off the surface, where the magnetic properties cause the polarization of the light to rotate due to the differences in the crystalline structure where the serial number was applied. The reflected image is viewed through an analyzer, which is just another polarized filter. In essence, it's visualizing the magnetic field that is disrupted by the differences in the metal properties created by the application of a serial number.

"It's an image you can look at directly and in real time," Luyendijk said. "That's the beauty of it. It is nondestructive, and you're not changing anything about the firearm. You could do it over and over again, and you could take it to court if you plan to do a demonstration."

Cost Considerations

During phase one testing, Luyendijk was concerned about cost. The sensor was mounted in an industry-standard viewing system that was priced at about \$15,000. In addition, each of the multilayered sensors cost about \$2,200, and they were not very durable. The system, mounted in a box, also could not read serial numbers on curved surfaces or hard-to-reach areas, such as the barrel or handle of a handgun.

During phase two testing, Luyendijk and Butell discovered that they could lay a sensor directly on a firearm and avoid the expensive viewing system. Butell also discovered that he could use fragments of broken sensors as long as they were big enough to cover an obliterated area.

“We’re using the broken parts from the manufacturer,” Butell said of his efforts to lower the costs. The sensor fragments, donated by the German company Matesy GmbH through the U.S. distributor Absolute Magnetic Measurements & Solutions, “are the carpet remnants of sensor manufacturing, the fragments they normally would throw out.”

Butell’s goal is to keep the costs low and the process simple so that it can be widely used in crime laboratories. “You can do this with a table lamp as your light source,” he said. The manufacturer has hardened the coating on the sensors so they don’t scratch as easily, he said, and the costs for the sensor fragments are less than \$1,000. That makes the MO sensor method comparable in cost to the MPI system, Luyendijk stated.

Butell’s goal is to add the MO method to the tools he already has to recover obliterated serial numbers. Acid etching will remain necessary for nonmagnetic firearms, he said, and MPI is a tried-and-true process that works well on many firearms. But the added sensitivity and ease of use of MO sensor technology make it a process that he would like to see available to all crime laboratories.

“The best case is we have all of these at our disposal,” Butell concluded.

Luyendijk said he is gathering the final data on the phase two work and intends to publish a final report within several months.

About the Author

Jim Dawson is a forensic science writer with Palladian Partners, Inc.

For More Information

To read more about phase one of the project, go to NIJ.gov, keyword: 245487.

*Photo taken by Johnson County Criminalistics Laboratory, Kansas.

NCJ 248776

3	36 ± 0.60	26.6 ± 0.44
4	50 ± 0.70	36.9 ± 0.51
4	65 ± 0.80	47.9 ± 0.59

Figure 5. Drop mass

Pin

ement Equipment

of accurately measuring the velocity of the drop mass within the 50.1 (36.9 ft. lbf) shall be employed. The measuring equipment shall measure the ± 0.05 m/s (± 0.16 ft/s) or better. Test instrument calibration

and made available to the NII agent. All calibration procedures and... to the requirements of a recognized Quality Assurance organization, and... s with a strike energy of 43 J (31 ft-lbf) to the... of the National Institute of Standards and Technology (NIST).
bf).

Inputs and Spike Specifications

knife blades described as P1 and S1, and the engineers have a broad spectrum of actual knives used in assaults on law enforcement personnel.

The knife blade or spike shall be inspected to ensure that the finish is complete, and that the knife blade or spike meets the requirements of the appendix A.

(Note: *See appendix A for measurement*)

On each test knife blade or spike shall be subjected to tip sharpening and the edge shall be found to be acceptable for use in the stab test. The 'edge hardness', value on the Rockwell C scale is the following minimum Rockwell hardness:

sharpness test, a standard Rockwell Hardness Testing machine is

Diagram illustrating the modified testing machine components:

- CHAIN
- SWIVEL
- KEY HOLE AND KEY POST

Armor Carrier

[illegible]

Armor Panel

The portion of an armor sample that generally consists of one or more slab protective component(s) (e.g., the front and back panels

Armor Sample

One complete armor garment consisting of a single wraparound front and back armor panels.

Backing Material

After the inspection, each test knife blade or spike shall be subjected to a tip sharpness test and shall be considered acceptable for use in the stab test if it produces a “hardness” between -50 and -150 on the Rockwell C scale in the following modified Rockwell hardness sharpness test.

Flag

The diagram shows a cross-section of an armor sample. A red circle labeled 'Flag' points to a small red square on the left side of the sample. A red circle labeled 'Minor Panel' points to a larger red square on the right side of the sample. The sample is shown in a cross-section view, with a blue background and a white border.

Figure 1. Schematic of armor and knife arrangement

Figure 1. Schematic of armor and knife arrangement

or panel whose primary purpose is to retain the armor plating and securing the armor garment to the body.

CHEEK PLATES

Table 1. Steel resistant protection level strike energies

Protection Level	E1" Strike Energy	E2" Overtest Strike Energy
	J	ft.-lbf
1	24 ± 0.60	36 ± 0.60
2	33 ± 0.60	50 ± 0.70
3	43 ± 0.60	65 ± 0.80
4	53 ± 0.64	81 ± 0.88
5	63 ± 0.64	97 ± 0.95

Figure 5. Drop mass

AN INSIDE LOOK AT CREATING STANDARDS FOR EQUIPMENT

BY SARAH B. BERSON

NIJ develops performance standards for the unique equipment used by criminal justice agencies to help improve criminal justice policy and practice.

NIJ published its first equipment standard for police body armor in 1972. Since then, NIJ has revised the standard several times to reflect new knowledge and address new threats. Because practitioner needs and technology are always changing, developing and revising standards requires continual assessment, improvement and engagement with practitioners. NIJ sat down with Chris Tillery, Office Director for NIJ's Office of Science and Technology, to examine the standards development process.

NIJ: Why does NIJ develop equipment performance and testing standards?

Chris Tillery (CT): One of NIJ's goals is to improve criminal justice policy and practice through the application of technology. Identifying the performance requirements of criminal justice practitioners and the equipment that meets those requirements is one way we do that. To that end, we develop performance standards for the unique equipment used by criminal justice agencies. (See Figure 1.)

NIJ's standards development process results in an articulation of the practitioner community's consensus about the minimum performance requirements for



Chris Tillery

Office Director
for NIJ's
Office of
Science and
Technology

a piece of equipment and the test methods needed to assess its performance. NIJ standards improve criminal justice policy and practice by setting the bar that equipment must reach to meet the requirements of criminal justice agencies.

NIJ is not a regulatory agency. Consequently, its performance standards are voluntary. Neither manufacturers nor criminal justice agencies *need* to adopt these standards. But there are reasons to do so. The manufacturers of the equipment — body armor, license plate readers, dash cams — are incentivized to meet the performance requirements of the standards, because they reflect the consumers' requirements. On the purchasing side, the standards give agencies the ability to compare different types of equipment against a common set of benchmarks.

Standards can also *raise* the bar for equipment performance. Here's how that happens: The practitioners say they need a widget that can do X. If there's a manufacturer out there who can do X and X is part of the standard, then agencies are going to want to buy things that do X. They will begin putting X into their requests for price quotes. So even though the NIJ standard is a minimum standard, it's also a best practice in the field. If manufacturers want to stay competitive, the equipment they create must eventually, at a minimum, do X too. That also provides an incentive for manufacturers to do better than X to differentiate their product from others on the market.

NIJ: How does NIJ decide which standards to develop?

CT: This decision arises out of how NIJ prioritizes its technology research investments. We do that by systematically engaging practitioners in discussions

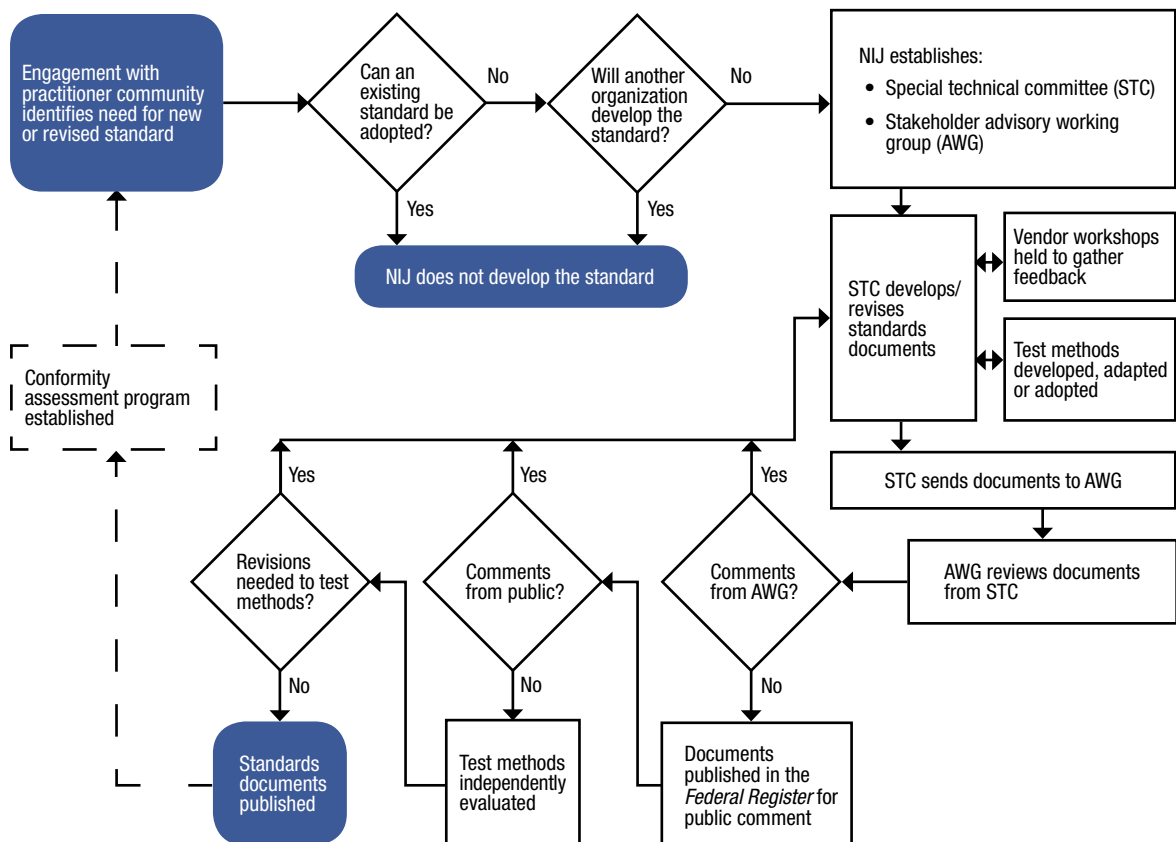
about their work. This helps us identify shortfalls in their capabilities that might be addressed by technology. Developing a new technology might be one way to address a shortfall. Developing a performance standard might be another way.

Wherever possible, NIJ adopts existing standards or adapts them to the needs of the criminal justice community. To this end, NIJ scientists and engineers participate in projects with other standards development organizations. Additionally, we coordinate closely with other federal agencies, such as the National Institute of Standards and Technology and the Department of Homeland Security, to ensure that NIJ is not duplicating their efforts.

NIJ: What's the process for actually creating a standard?

CT: Practitioner-based special technical committees write the standards. NIJ believes that the people who

Figure 1. NIJ's Standards Development Process



will use the equipment are best suited to understand what the equipment should be able to do.

In addition to expert criminal justice practitioners, the special technical committees include scientists, engineers, test laboratory personnel and experts in conformity assessment. If there's a representative voice that speaks for the entire manufacturer community, we might also have them at the table. When that's not the case, as with body armor, we engage manufacturers during the development of a standard through workshops so they can provide input.

The manufacturer community might also provide input during the public comment period. All NIJ-developed standards provide at least one opportunity for public comment. Depending on the degree of change in the draft standards resulting from the first public comment period, NIJ might open a second public comment period.

The work of a special technical committee is reviewed by an advisory working group, which consists of representatives of the major practitioner stakeholder organizations (such as the International Association of Chiefs of Police) and relevant federal agencies.

There are two major purposes for developing standards this way. One is to get the buy-in of the people who are going to use the equipment. The other is to help ensure that what comes out of this process is a community consensus with respect to the requirements. More than 17,000 law enforcement agencies are out there. How do you achieve consensus? You do it through this sort of process. You use expert practitioners and representatives from the larger community.

The goal is to develop a requirements document that represents the consensus of the community about the performance characteristics of a piece of equipment that are most important and what those characteristics should be.

When the special technical committee and advisory working group have finished, the next stage is to validate the test method included in the standards.

The validation process includes asking for existing equipment from the manufacturer community. To do so, NIJ will put a call out: "If you manufacture widgets, we would really love for you to provide one of your widgets for us to test." What we want to do in testing is to demonstrate that there is at least one piece of equipment out there that can meet the standard.

A standard is an exercise in what is doable. For example, the practitioners on a special technical committee might say that their ideal requirement is for a widget that tells them something *instantaneously*, but the researchers on the committee might point out that instantaneous communication violates the laws of physics, and the test lab guy on the committee might point out that they can't test for it. So it's this iteration between the ideal requirement and the need for something you can actually create and test. You keep going back and forth until you get something that the user can live with *and* that you can test *and* that the manufacturer might actually be able to meet.

NIJ: The Justice Department recently approved an NIJ trademark for standards. Why is that something NIJ decided to pursue?

CT: We wanted to explore the potential of using a trademark to reduce representations that a piece of equipment complies with an NIJ standard when it does not. Such representations can happen in several ways, including lack of familiarity by manufacturers or practitioners with NIJ's compliance testing program and, potentially, intentional deception.

Our first planned application of the trademark is on body armor. The problem now is, if a manufacturer says, "This body armor meets the NIJ standard," or, "This body armor is designed to meet the NIJ standard," then how can you gainsay that? Or if a manufacturer says that its body armor is "NIJ certified," do all buyers know that that statement is false, because NIJ doesn't certify products? Part of our effectiveness — in fact, part of the effectiveness of voluntary standards — depends on criminal justice agencies being able to differentiate between participating and nonparticipating equipment. Misrepresentations decrease the effectiveness of the standards.

If we trademark equipment that *does* meet the standards, then there's no question. A trademark clearly communicates a product's compliance with NIJ standards to the law enforcement and corrections practitioners who want to buy it. Agencies buying body armor with the trademark can be confident that it meets their requirements. Having a trademark also provides a legal remedy for false representations where there is not one now.

NIJ: Budgets have gotten tighter for federal agencies in recent years. How is the current fiscal environment affecting standards development at NIJ?

CT: The fiscal environment is a challenge. It limits the number of standards we can develop and maintain and the speed with which we can do that. One way we're trying to maximize our resources and still meet the needs of criminal justice practitioners is by partnering with private-sector voluntary consensus standards development bodies, for example, ASTM International and the National Fire Protection Association (NFPA), in the development of standards that address the requirements of criminal justice agencies.

NIJ: The idea being that these bodies, rather than NIJ, would develop standards?

CT: To the extent possible, NIJ will encourage standards development bodies to develop and maintain needed standards. This strategy is rooted in the National Technology Transfer and Advancement Act, which encourages federal agencies to use voluntary consensus standards to the greatest extent practicable and to collaborate and participate with groups that are developing them.

NIJ: How can NIJ be sure that standards developed by private-sector standards development organizations, which don't focus on criminal justice, will meet the needs of criminal justice practitioners?

CT: Implementing this strategy effectively requires the active participation of NIJ scientists and engineers in standards development organizations. The National Technology Transfer and Advancement Act

encourages federal representatives to participate on voluntary consensus standards bodies and be as active as possible, and the Department of Justice has found the participation of NIJ scientists and engineers to be in the public's interest, because it saves the federal government money and improves the speed of standards development.

Debra Stoe, an NIJ scientist, is on an ASTM subcommittee for the E54 Homeland Security Applications Technical Committee. Brian Montgomery, an NIJ engineer, leads the NFPA's technical committee that is developing the self-contained breathing apparatus standard. NIJ's participation will ensure that resulting standards adequately consider and meet law enforcement requirements. Because NIJ engages the practitioner community and understands its technology requirements, we can ensure that its requirements are accurately and effectively translated to these organizations and ultimately reflected in the standards.

NIJ: Anyone can download standards developed by NIJ for free. Will that be the case with standards developed by private-sector standards development organizations, or will practitioners have to purchase them?

CT: One drawback to this strategy is that standards developed by voluntary consensus standards bodies are not necessarily free. Although not exorbitant, there are fees, typically less than \$100 per license. One of the things we did was to establish an agreement with ASTM in which NIJ will pay an annual stipend of \$30,000 to provide any criminal justice or public safety agency with unlimited free access to the complete library of ASTM E54 Standards on Homeland Security Applications, including the body armor fitting standard developed by ASTM.

Read more about NIJ's work with ASTM, and learn how criminal justice professionals can register to access ASTM standards for free. Visit NIJ.gov, keywords: access ASTM.

What Happens After a Standard Is Published?

After publication of the standard, a conformity assessment program must be established to identify equipment that conforms to the standard. Conformity assessment programs can take a number of different forms depending on implementation cost and the risk associated with the failure of a piece of equipment. The simplest type of conformity assessment involves the manufacturer or supplier declaring that a piece of equipment meets the requirements of a standard. Third-party testing for conformity, as exemplified in the NIJ compliance testing program for body armor, is another. Learn more at NIJ.gov, keywords: body armor inspection.

NIJ reviews its standards and conformity assessment programs on a recurring basis. Reviews can lead to a number of outcomes, including updating a standard, retiring a standard if it is no longer needed or changing the conformity assessment program.

NIJ: What has NIJ achieved so far with this strategy and what are its plans for the future?

CT: We've already encouraged the development and publication of one standard through this process. Debra Stoe, NIJ's official representative on ASTM's E54 committee, worked with other committee members to help ensure that body armor fits well into the ASTM Work Plan; and in 2013, ASTM published *Standard Practice for Measurement of Body Armor Wearers*. As a result of that successful collaboration, ASTM is developing several other standards relevant to criminal justice practitioners, including one on ballistic-resistant shields. Additionally, as I mentioned earlier, the NFPA is developing a respirator standard that will address the requirements of law enforcement agencies, and Brian Montgomery is leading the committee developing that standard.

Although the cost to the federal government is lower when private-sector standards development organizations develop and maintain standards, that's not always going to be feasible. When it's not, NIJ will encourage them to develop and maintain test methods that we can incorporate into NIJ-developed standards, which would help reduce the required federal funding. And that's something we already do to an extent. Many of the test methods in the CBRN protective ensemble standard, for example, were pulled directly or adopted from several standards developed by the NFPA. Our recent standard for protective ensembles

worn by bomb disposal technicians also incorporates portions of NFPA standards. So we're expanding and accelerating something that we've been doing all along. We're just trying to do it more.

Our hope is that in the future, NIJ will fund the development of standards and test methods only when a standards development organization in the private sector cannot be encouraged to do so.

About the Author

Sarah B. Berson is a project director at Palladian Partners, Inc.

For More Information

Learn more about standards at NIJ, including accessing a list of active standards and information on standards under development, at NIJ.gov, keyword: standards.

Read about NIJ's body armor research and find the compliant products list for bullet- and stab-resistant body armor at NIJ.gov, keywords: body armor.

NCJ 248780



SOCIAL SCIENCE RESEARCH ON FORENSIC SCIENCE: THE STORY BEHIND ONE OF NIJ'S NEWEST RESEARCH PORTFOLIOS

BY **KATHARINE BROWNING**

In 2005, NIJ began funding social science research on issues relating to forensic science, initiating an entirely new line of research.

The last few decades have seen numerous exciting technological advances in the forensic sciences. But actually using these new forensic technologies to catch and convict perpetrators and clear the innocent is much more complicated than it looks on TV. This is where social science comes in.

Only through social science research — studying how human beings can and should use these new technologies — can we ensure that our nation's criminal justice practitioners are maximizing the use of ever-evolving developments in the forensic sciences. A decade ago, NIJ began to study how new forensic technologies were actually being used in the investigation and prosecution of crime and how they could be used even more effectively.

This article looks at the evolution of NIJ's portfolio of social science research on forensic science and provides examples of some of the studies NIJ has funded along the way. We hope that this retrospective — of how we got from there to here in just 10 years — will inspire other innovative ideas as new technological advancements are adopted in the field of criminal justice.

In the Beginning ...

In 2004, staff from NIJ's Office of Research and Evaluation (ORE) and what is now known as the Office of Investigative and Forensic Sciences (OIFS) began working together to explore how DNA was being used in investigations. At that time, these two sides of the house pursued fairly independent research agendas; each had its own discrete topics of interest.

ORE focused on a wide variety of social science research. OIFS administered funding from two primary sources: the DNA Initiative and Coverdell funds, designed to increase public crime laboratories' capacity to handle the growing amount of forensic evidence they received for analysis.

Although a small portion of the DNA Initiative money was used for basic and applied research and development, primarily in the area of forensic DNA, almost no social science research investigated the impact of all this funding or how the explosion in new forensic technologies and techniques was affecting the criminal justice system.

Why is understanding this human impact so important? Two reasons. First, it provides crucial feedback from the "consumers" — in this case, crime laboratories and police departments, the judiciary and crime victims, prosecutors and defense counsel, corrections professionals who use forensic technologies, and the policymakers who must make decisions on how best to spend precious fiscal resources. Second, the introduction of new technologies and techniques alone does not tell us whether they are effective in improving criminal justice outcomes. Social science research can shed light on changes in those outcomes.

Considering that the nation was investing significant dollars to improve forensic tools and processes, examining the impact this investment had on the criminal justice system seemed reasonable. NIJ's social scientists started asking "So what?" questions:

- Are we getting more "justice" as a result of advances in the forensic sciences?
- Is forensic evidence being used as efficiently and effectively as possible in criminal investigations and prosecutions?
- What impact do forensic science advancements have on criminal justice policies and procedures in police departments and crime laboratories, in courthouses and prisons, and among victim-services providers?

Building a Shared Understanding of Each Other's Science

First, it is important to understand that although they share the same understanding of scientific principles and the importance of science, social scientists and physical scientists come from different backgrounds. Ten years ago, NIJ's social scientists had a limited understanding of the forensic disciplines (such as ballistics; DNA; or hair, fiber or fingerprints) and the daily issues facing forensic scientists in the nation's crime laboratories. They tended to look at forensic science and crime laboratory issues as one part of the larger system of justice. Similarly, NIJ's forensic scientists were not accustomed to looking at their disciplines through a social science lens. Instead, they focused on how to improve science and enhance laboratory capacity and operations.

What the social and forensic sciences perspectives did share was a commitment to using scientific methods to improve public safety by helping criminal justice practitioners do their jobs better. Their common commitment and shared scientific penchant for operating beyond their comfort zones allowed NIJ to start developing a new vocabulary. The program development process behind NIJ's social science research on forensic science involved years of outreach to the field and discussions among NIJ's social and physical scientists to discover the important research questions. However, when we looked outside NIJ for research proposals, we quickly discovered a paucity of researchers with expertise in both social science and forensic science.

Because social scientists did not fully understand the challenges that crime laboratories and forensic examiners faced, they tended to submit research proposals to open calls for research in this area that, although sound from a methods perspective, were not particularly relevant to practitioners or contained errors regarding the use of forensic science in the field. We encountered the opposite problem with forensic scientists, who submitted very relevant social science research proposals that were weak in social science methods.

To compound the problem, forensic science academics and their social science counterparts in criminology, sociology and psychology frequently work in entirely different departments in colleges and universities. They traditionally did not collaborate in these vastly different areas, making it difficult for them to team up on research proposals in response to NIJ solicitations.

As a result of these challenges, NIJ's early solicitations for social science research on forensic science resulted in only one or two fundable proposals in the first few years; the Institute actually had greater success in generating relevant research using more directed studies in which it specified the research questions to be addressed. The research community at large is often a source of new and innovative research ideas, yet with this portfolio, we found that generating interest in studying these issues took some time, particularly in the academic community. The reasons for this are not clear, but perhaps the stovepiped nature of academia made it difficult for researchers to see this as a viable new field of research for their departments.

NIJ developed this hybrid expertise (combining the forensic and social sciences) through workshops and working groups. The Institute held its first forensic science workshop for social scientists in 2008, and this discussion helped inspire a group of social scientists to get together and think through the forensics-practitioner issues more thoroughly. By 2011, NIJ's solicitation for social science research on forensic science yielded several solid proposals, and we were able to fund five projects. The trend continued in 2013, when we funded seven projects.

The Three “Waves” That Built the Portfolio

NIJ's portfolio of social science research on forensic science was built in three “waves.” Each wave gained strength from the ebb of the previous wave as research findings and expertise in the field grew.

Research in the first wave (2005-2007) asked basic questions, such as “How often is forensic

evidence used in criminal cases?” The second wave (2007-2009) began to focus on emerging issues and “hot topics” surrounding DNA databases, improving the processing of impression evidence, and tackling evidence backlogs in police departments. The third wave, which began in 2010, focused primarily on findings and recommendations by the National Academy of Sciences in its seminal report *Strengthening Forensic Science in the United States: A Path Forward*. In fiscal year 2015, we are entering the fourth wave as we assess and build on what we have learned to date and explore new areas in forensic science, such as digital forensics, ballistics and crime-scene scanning technology.

Wave One (2005-2007)

Using DNA to Solve Property Crimes

Inspired in part by the U.K.'s expanded use of forensic DNA to solve nonviolent crimes, NIJ launched a multisite demonstration field experiment to see whether collecting DNA in property crimes could solve more burglaries and have an impact on low clearance rates. Five jurisdictions (Denver, Los Angeles, Orange County [California], Phoenix and Topeka) ran randomized controlled trials. An evaluation found that, compared to using traditional investigative methods, collecting DNA in property crimes led to twice as many suspect identifications, arrests and prosecutions. Learn more at NIJ.gov, keywords: dna property crimes.

- Read an *NIJ Journal* article about the research, “DNA Solves Property Crimes (But Are We Ready for That?),” at NIJ.gov, keyword: 224084.

Impact of Federal Funding on Backlog of DNA Samples in Crime Laboratories

A critical question for the nation was what impact funding was having on the effort to reduce the backlog of DNA samples in crime laboratories. An evaluation that generated baseline data revealed that, despite federal assistance, the backlog of DNA crime-scene evidence in state and local laboratories had increased considerably between 2002 and 2005. Further analysis revealed that the increase was due to

a combination of factors, including the influx of crime scene evidence from property crime offenses, which NIJ has reported on extensively since this initial study. Read an abstract and access the final report at NIJ.gov, keyword: 225803.

The Role of Forensic Evidence in Criminal Justice Processes

Researchers examined the role of forensic evidence in solving five felony crimes (aggravated assault, burglary, homicide, rape and robbery) in five jurisdictions. Overall, the findings suggested that law enforcement officers determined which forensic evidence from crime scenes would be sent to the laboratory for analysis; this means that officers were exercising significant discretion in deciding evidence-examination priorities and practices. The researchers made 10 important recommendations, which formed the basis of the fiscal year 2011 Social Science Research on Forensic Science solicitation. Read an abstract and access the final report at NIJ.gov, keyword: 231977.

The Impact of Forensic Evidence in Law Enforcement Processes

In this project, researchers tracked the use of forensic evidence in five types of cases (homicide, sexual assault, aggravated assault, robbery and burglary) in two jurisdictions. One key finding was that forensic evidence was being collected in almost all homicides and most sexual assaults, but the rate dropped considerably in aggravated assaults, robberies and burglaries. Another key finding was that convicted defendants in cases with probative forensic evidence received longer sentences than convicted defendants in cases where there was no forensic evidence. Read an abstract and access the final report at NIJ.gov, keyword: 236474.

Wave Two (2007-2009)

Science — and building evidence and knowledge — is often a slow, deliberate process. It is not for the impatient. As we waited for results from the first wave of rigorous studies, NIJ's scientists attended forensics conferences and discussed issues with crime laboratory personnel. Our social and forensic

scientists met regularly to identify emerging issues, and during these years, we funded a range of interesting projects.

Forensic Evidence Not Sent to the Laboratory for Analysis

Researchers conducted a nationwide survey of 2,000 police departments to estimate the number of unsolved criminal cases involving forensic evidence that had not been submitted to crime laboratories for analysis. They found that evidence had not been sent to the laboratory in 14 percent of open homicides, 18 percent of open rape cases and 23 percent of open property crime cases. NIJ has reported extensively on these findings, including the reasons police, at that time, said they did not send forensic evidence to the laboratory. Read an abstract and access the final report at NIJ.gov, keyword: 228415.

- Read an *NIJ Journal* article, "Untested Evidence: Not Just a Crime Lab Issue," at NIJ.gov, keyword: 230417.

The Deterrent Effect of DNA Databases

Looking at a large number of offenders who were released from the custody of the Florida Department of Corrections between 1996 and 2004, researchers attempted to determine whether an offender's knowledge that his or her DNA profile was in a law enforcement database deterred additional offending. The results showed that offenders who had their DNA recorded in a database were likely to be rearrested and reconvicted more quickly than those who did not. Read an abstract and access the final report at NIJ.gov, keyword: 236318.

Processing Evidence in Drug Cases

Researchers looked at 10 jurisdictions to determine how evidence in controlled substances cases was processed and, in particular, what role the forensic analysis played in the prosecutor's decisions about filing charges, pretrial plea negotiations and posttrial convictions. The researchers found considerable variation among the jurisdictions. For example, jurisdictions often did not use (or require) laboratory drug analysis results as part of the charging process;

in many jurisdictions, the charging decisions were tied to a field test and not to a confirmatory analysis. Read an abstract and access the final report at NIJ.gov, keyword: 233830.

Collecting DNA From Juveniles

After examining laws, policies and practices, researchers reported that in 2010, 30 states collected DNA from juveniles. Although all states had provisions for expunging DNA profiles and samples, few expungements actually occurred, and the burden typically fell on the offender to request expungement. Read an abstract and access the final report at NIJ.gov, keyword: 237193.

Postconviction DNA Testing and Wrongful Convictions

In 2008, researchers set out to estimate the rate of possible wrongful convictions in sexual assaults or homicides in Virginia from 1973 to 1987 — and to identify factors that could predict wrongful convictions. Evidence from 634 cases in which physical evidence was still available was sent to a private laboratory for DNA analysis. The results revealed that the person who was convicted of the crime was not consistent with the DNA profile in 7.8 percent of the cases, and the results supported exoneration in 5.3 percent of the cases. Read an abstract and access the final report at NIJ.gov, keyword: 238816.

- Learn more about research on DNA's role in uncovering wrongful convictions at NIJ.gov, keywords: wrongful conviction dna.

Including Arrestees in DNA Databases

This project examined the policies, practices and implications of including arrestees in state and federal DNA databases. At the time of the study, 28 states had laws authorizing DNA collection from individuals arrested for or charged with certain offenses. These laws varied across states, particularly with respect to qualifying offenses, point of collection and analysis, and expungement procedures. Read an abstract and access the final report at NIJ.gov, keyword: 242812.

- Read an *NIJ Journal* article about the interim findings, “Collecting DNA From Arrestees: Implementation Lessons,” at NIJ.gov, keyword: 238484.

Wave Three (2010-2015)

By 2010, the first five years of social science investment into forensic science began to yield significant progress. Researchers around the country were developing expertise in the burgeoning field, resulting in better research proposals and an expanded pool of researchers submitting proposals in response to our solicitation. Findings from the research initiated in waves one and two were beginning to come in. In addition, the National Academy of Sciences released its seminal report *Strengthening Forensic Science in the United States: A Path Forward*. Access the full report at NIJ.gov, keyword: 228091.

These three factors coalesced with a growing awareness that many police departments around the country possessed evidence from sexual assault cases that had not been sent to a crime laboratory for analysis. Since 2010, NIJ has funded a number of social science research projects to improve the use of forensics in solving sexual assaults.

Untested Sexual Assault Kits in Los Angeles

By fall 2008, the Los Angeles sheriff and police departments had custody of nearly 11,000 sexual assault kits (SAKs) that had not been sent to a crime laboratory for analysis. When officials decided to have them DNA-tested, researchers looked at two random samples in an effort to help understand the value — in terms of solving crimes and garnering justice for the victims and society — of testing the SAKs. Read an abstract and access the final report at NIJ.gov, keyword: 238500.

- Read an *NIJ Journal* article about the research in L.A., “Solving Sexual Assaults: Finding Answers Through Research,” at NIJ.gov, keyword: 238483.

“Action Research” on Untested SAKs in Houston and Detroit

This “action-research” project sought to determine why SAKs had not been sent to the crime laboratory for testing in Wayne County, Michigan (Detroit), and Houston, Texas. Multidisciplinary teams explored how this situation developed, the nature of cases reflected in the untested kits, how victims should be notified if their case was reopened after many years, and what kind of training law enforcement officers need to make the best decisions about sending SAKs to the crime laboratory.

- Read an abstract and access the final report from Detroit at [NIJ.gov](http://nij.gov), keyword: 248680.
- Learn about the findings from Houston at <http://www.houstonsakresearch.org>.
- Read more about NIJ research on untested SAKs and watch interviews with the researchers at [NIJ.gov](http://nij.gov), keywords: untested kits.

Forensic Evidence and Criminal Justice Outcomes

Researchers looked at a random sample of evidence in sexual assault cases in Massachusetts between 2008 and 2010. They studied the relationship of the physical injury and forensic evidence to the criminal justice outcomes and, particularly, the role of evidence in cases with child victims, with stranger assailants, and in which sexual assault nurse examiners collected the evidence. The researchers found that about one-third of the cases involving adult victims who received a sexual assault exam were unfounded, and 41.2 percent of the founded incidents resulted in arrest. Consistent with prior research, documentation of physical force decreased the likelihood that a case was unfounded. Read an abstract and access the final report at [NIJ.gov](http://nij.gov), keyword: 248254.

In addition to this research on using DNA to solve sexual assaults, in the third wave, NIJ has used a social science approach to study other forensic sciences. For example, projects have evaluated how well the nation's ballistics (bullets and cartridge cases) database is working to solve gun crimes and have

sought ways to improve the value of “cold” DNA hit investigations. Many of these projects are ongoing.

Performance of the National Integrated Ballistic Information Network

Researchers evaluated the performance of the National Integrated Ballistic Information Network (NIBIN), operated by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). The researchers concluded that NIBIN “is a tool with massive untapped potential due in part to chronic underfunding and due to a limited vision of its capacity.” Read an abstract and access the final report at [NIJ.gov](http://nij.gov), keyword: 243875.

- Read an *NIJ Journal* article about the ballistics database evaluation, “Study Identifies Ways to Improve ATF Ballistic Evidence Program,” at [NIJ.gov](http://nij.gov), keyword: 247878.
- Watch William King and ATF Special Agent John Risenhoover’s *Research for the Real World* presentation about the study at [NIJ.gov](http://nij.gov), keywords: NIBIN seminar.

Solving Cold Cases With DNA

This project is examining DNA “cold” Combined DNA Index System (CODIS, the national criminal justice database of DNA profiles) hits — a DNA match to a person not previously suspected in a case — in two jurisdictions (Kansas City and Phoenix) to determine how police investigators and prosecutors use information generated from the hits. Results are expected in 2016. Read more about the grant at [NIJ.gov](http://nij.gov), keyword: 2010-DN-BX-0002.

Impact of Forensic Evidence on Arrest and Prosecution

Researchers are looking at a random sample of 2,500 cases in Connecticut to estimate the percentage of cases in which forensic evidence was collected from crime scene evidence, what kinds of evidence were collected, how such evidence was used throughout the system, and which types of evidence were most effective in solving particular types of crimes. Results are expected in 2016. Read more about the grant at [NIJ.gov](http://nij.gov), keyword: 2011-DN-BX-0003.

Improving the Use of Forensic Evidence

This project examines the use of forensic evidence in eight jurisdictions around the country. Researchers are interviewing law enforcement officers, forensic scientists and district attorneys and are tracking a sample of recent cases from investigation to adjudication. They also are analyzing data from the Bureau of Justice Statistics census of U.S. crime laboratories to determine what impact, if any, a laboratory's type of payment system and organizational structure have on its productivity and public safety. Finally, the researchers are conducting a national survey of prosecutors and defense counsel to better understand how forensic evidence affects the perceived strength of the case during plea-bargaining and trial. Results are expected in late 2015. Read more about the grant at NIJ.gov, keyword: 2011-DN-BX-0004.

Solving Homicides

This project looks at how investigators use both analyzed and unanalyzed evidence in homicide investigations. Working with the Cleveland (Ohio) Police Department, researchers are looking at the type of evidence collected (DNA, latent prints, firearms, trace, etc.) in approximately 300 homicides that occurred between 2009 and 2011. They also are interviewing investigators to determine why they selected specific items to send to the laboratory for analysis and how they used the laboratory results in their investigations. Results are expected in late 2015. Read more about the grant at NIJ.gov, keyword: 2011-DN-BX-0007.

Moving Forward

Synthesizing social science findings and using them in innovative future research is key to helping criminal justice practitioners use advancements in forensic science as effectively and efficiently as possible in the laboratories, on the streets and in our courtrooms.

One way NIJ ensures that our investments are relevant and cutting-edge is by engaging directly with the field. For example, in 2013, we invited 25 of the nation's top forensic and social science experts to Washington, D.C., to help us take stock: Where are we in understanding the growing importance of forensic evidence in the

prosecution of criminal cases? Where do we need to go in the next decade? A number of issues and priorities came out of the meeting. For example, how can science help the field move toward more meaningful ways of measuring the value of CODIS hits with respect to investigative and judicial outcomes? Currently, CODIS automatically terms a hit as "investigation-aided," but we know that a hit must go to a detective and be acted upon before it can aid an investigation. Read a summary of the 2013 meeting at NIJ.gov, keywords: social forensic science meeting.

As NIJ moves forward, our focus will be on assessing and synthesizing what we know, developing new research questions, and examining gaps in our knowledge. Social science research on forensic science is a category in our 2015 Research and Evaluation on Justice Systems solicitation, highlighting new areas of interest such as digital forensics, ballistics forensics and crime scene technology.

The demands on state and local jurisdictions to collect more evidence — and on crime laboratories to analyze it — continue to increase. Simultaneously, economic resources are decreasing. We must keep learning how to be more efficient in using ever-evolving forensics technologies and examining the actual justice outcomes resulting from forensic evidence so that limited resources can be used wisely.

About the Author

Katharine Browning is a social science analyst in NIJ's Justice Systems Research Division.

For More Information

To see the most up-to-date list of research projects on social science research on forensic science, go to NIJ.gov, keywords: understanding social forensic impact.

NCJ 248782



RESEARCH DESIGNS IN THE REAL WORLD: TESTING THE EFFECTIVENESS OF AN IPV INTERVENTION

BY JILL THERESA MESSING, JACQUELYN CAMPBELL AND JANET SULLIVAN WILSON

Many factors can influence study design, particularly when evaluating an intervention in the field. Although randomized controlled trials are considered the gold standard of evaluations, there are practical and ethical considerations that may exclude their use. This case study looks at those factors and their impact on an evaluation of an intimate partner violence intervention.

Approximately one-third of women experience intimate partner violence (IPV) in their lifetimes.¹ Many women call the police when their partners become violent or when the violence becomes more frequent or severe.²

The criminal justice response can hold offenders accountable, but it is not designed to attend to the safety needs of victim-survivors in the same way that domestic violence advocacy agencies are equipped to do.

The Lethality Assessment Program (LAP) is an innovative intervention that occurs at the scene of a police-involved IPV incident and provides risk assessment, followed by advocacy services, for victim-survivors who are at high risk of being killed by their intimate partners. At the program's core is a collaborative partnership between law enforcement agencies and local domestic violence service

providers. Police departments and advocacy agencies throughout the U.S. are adopting the LAP,³ but before the current study, little was known about how well this intervention works.

Our NIJ-funded study was the first rigorous evaluation of the LAP. Our objective was to assess the effectiveness of this promising intervention while maintaining the integrity of the LAP and adhering to our ethical principles as researchers and helping professionals. Therefore, choosing the most appropriate research design was paramount.

The LAP

Developed by the Maryland Network Against Domestic Violence, the LAP brings law enforcement and local domestic violence service providers together to empower IPV victim-survivors in self-care decisions.

Near the end of the investigation at an IPV incident scene, the police officer administers a brief risk assessment screen (“Lethality Screen”) to gauge the victim-survivor’s level of risk for being killed by the IPV offender.⁴ If a victim-survivor screens in as “high risk,” which means having an increased risk of being killed by the intimate partner, then the police officer calls the local domestic violence hotline at a collaborating advocacy organization for information on planning for the victim-survivor’s safety (“Protocol Referral”). For more detailed information on the LAP, see the sidebar, “A Closer Look at the Lethality Assessment Program.”

Choosing a Research Design

In our evaluation of the LAP, we examined the intervention’s two main goals: (1) decrease the frequency and severity of violence and (2) increase rates of emergency safety planning and help-seeking among women who participate in the intervention. To determine whether the LAP was achieving these goals, we used a quasi-experimental research design in which we could compare two similar groups of people: one group that received the LAP intervention and another group that did not.

Randomized controlled trials (RCTs), also called “true experimental designs,” are generally considered the gold standard for evaluation studies because RCTs can rule out alternative explanations for the findings. (See the related article, “Services for IPV Victims: Encouraging Stronger Research Methods to Produce More Valid Results,” in issue 274 of the *NIJ Journal*.) In RCTs, the researchers can be relatively certain that any changes found are caused only by the intervention, not by outside influences, because RCTs have three basic characteristics:

- The intervention occurs before measuring the outcome of interest.
- The intervention is given to only some of the participants in the study, creating a comparison.

- The people in the study are randomly assigned into either a group that receives the intervention or a group that does not. Random assignment theoretically ensures that the groups’ characteristics are the same before the intervention and that any differences in outcomes between the groups are due to the intervention.

Our ethical obligations as researchers are respect for persons (self-determination), beneficence (do not harm, and maximize the benefits of research), and justice (people should be treated equally).⁵ Because the women in our study faced a high risk for homicide due to the fact that they were victims of high-risk IPV cases, we did not feel that we could meet our ethical obligations as researchers or professionals by using an RCT. (See sidebar, “Working With Institutional Review Boards.”) For instance, if we employed an RCT to evaluate the LAP, we would need to:

- Locate women at the scene of a police-involved IPV incident who would screen in as high risk according to the Lethality Screen.
- Randomize these women into either a group that receives the intervention or a group that does not.
- Gather data from all the women.
- Administer the LAP to the intervention group.
- Gather data from all the women again.

We could have recruited women at the scene of a police-involved IPV incident, administered the Lethality Screen to determine the women’s eligibility, randomized high-risk victim-survivors into intervention and control groups, interviewed the women, placed those in the intervention group on the telephone with a hotline counselor and interviewed everyone again at some follow-up point. In this process, all of the intervention steps would remain intact.

But the LAP is more than the sum of its parts. If we used an RCT design, researchers — not police officers — would administer the Lethality Screen and conduct the Protocol Referral. The intervention would not be administered at the scene of an IPV incident because too many intervening steps would need to occur (first we would need to determine eligibility,

and then we would randomly assign the women to groups). Furthermore, practical considerations, such as where the intervention would occur and how to conduct such an intervention with women in high-risk situations, would make study administration difficult.

Moving the LAP out of the field and into a controlled setting would have diminished it in such a way that it would not have been the same intervention. Thus, we agreed that for this research to truly evaluate the LAP, police officers must administer both the Lethality Screen and the Protocol Referral at the scene of an IPV incident for women in the intervention group. Therefore, we would interview women as soon as possible after the police intervened and ask them about their victimization and help-seeking behavior both before and after the incident date.

Still, we struggled with randomization to groups, an important component of an RCT. We considered having officers randomize women into intervention and control groups at IPV incident scenes. However, instructing officers to conduct the LAP with a random selection of participants was logistically impractical. Officers might have chosen to provide the intervention to a participant assigned to the control group, or they might have chosen not to provide the intervention to a participant assigned to the intervention group.⁶ After being trained on the LAP, officers might also use intervention techniques with the non-intervention group, either consciously or subconsciously.

We considered randomly assigning the intervention by police jurisdiction, but this also made little practical sense. First, there were only two large population centers in the state where we conducted the research, and the regional and geographic differences between them were too large to consider them equivalent. As we moved forward, we discovered that participating jurisdictions had very different operating procedures, implementation fidelity and referral rates. Second, our police and advocacy partners were participating, in part, to receive training and technical assistance on the LAP. To provide this to some partners and not to others — or even to stagger it — would have hindered our researcher-practitioner partnership.

The professional imperatives of our research team (made up of doctoral-level social workers and nurses) and of our advocacy partners also made the idea of random assignment ethically untenable. Both social workers and nurses have ethical obligations to enhance the well-being of research participants and uphold their dignity and worth; the primary commitment of both professions is to help others.⁷ Determining that women were at high risk for domestic homicide and then withholding a potentially helpful intervention from a randomized group would have been unethical because it placed women's lives at risk.⁸


Self-determination is also an important ethical consideration for social workers and nurses. For that reason, we strongly believed that the women should be able to decide independently whether to participate in the intervention, the study or both without one decision affecting another. We wanted the women to be able to choose whether to answer the questions on the Lethality Screen. If they screened in as high risk, they could then choose whether to talk on the phone with the hotline advocate. We also believed that women should be given the choice to participate in the research study regardless of whether they engaged in any aspect of the intervention. Thus, women who received the intervention could choose whether to participate in the study, and women who participated in the study could choose whether to receive the intervention.

In an RCT, a person's ability to receive the intervention is generally contingent upon his or her choice to participate in the study. But because of random assignment, the choice to participate does not guarantee receiving the intervention. In other words, the women might choose to participate in the study in hopes of receiving the intervention, but intervention assignment is not guaranteed. Some RCT designs have attempted to ameliorate this by providing the intervention to the control group after the study ends. But given the high level of risk faced by potential participants and the length of our study (at least six months), we felt that it was important not to withhold or delay intervention for women who wanted to receive it.


A Closer Look at the Lethality Assessment Program

The dual goals of the Lethality Assessment Program are to educate intimate partner violence (IPV) victim-survivors about risk factors for homicide and to connect them with support and safety planning services. Collaboration, education and self-determination are the touchstones of this intervention.

Near the end of an investigation at an IPV incident scene, the police officer will administer a brief risk assessment screen to the victim-survivor. This “Lethality Screen” is an 11-item questionnaire that assesses the victim-survivor’s level of risk for being killed by the IPV offender.



Domestic Violence Lethality Screen For First Responders



Officer: _____ Date: _____ Case: _____

Victim: _____ Offender: _____

■ Check here if victim did not answer any of the questions.

▶ **A “Yes” response to any of Questions #1-3 automatically triggers the protocol referral.**

1. Has he/she ever used a weapon against you or threatened you with a weapon?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
2. Has he/she threatened to kill you or your children?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
3. Do you think he/she might try to kill you?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.

▶ **Negative responses to Questions #1-3, but positive responses to at least four of Questions #4-11, trigger the protocol referral.**

4. Does he/she have a gun or can he/she get one easily?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
5. Has he/she ever tried to choke you?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
6. Is he/she violently or constantly jealous or does he/she control most of your daily activities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
7. Have you left him/her or separated after living together or being married?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
8. Is he/she unemployed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
9. Has he/she ever tried to kill himself/herself?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
10. Do you have a child that he/she knows is not his/hers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.
11. Does he/she follow or spy on you or leave threatening messages?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Ans.

▶ **An officer may trigger the protocol referral, if not already triggered above, as a result of the victim's response to the below question, or whenever the officer believes the victim is in a potentially lethal situation.**

Is there anything else that worries you about your safety? (If “yes”) What worries you?

Check one: ☐ Victim screened in according to the protocol
 ☐ Victim screened in based on the belief of officer
 ☐ Victim did not screen in

If victim screened in: After advising her/him of a high danger assessment, did the victim speak with the hotline counselor?
 ☐ Yes ☐ No

Note: The questions above and the criteria for determining the level of risk a person faces is based on the best available research on factors associated with lethal violence by a current or former intimate partner. However, each situation may present unique factors that influence risk for lethal violence that are not captured by this screen. Although most victims who screen “positive” or “high danger” would not be expected to be killed, these victims face much higher risk than that of other victims of intimate partner violence.

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It is suggested that the officer use the Lethality Screen when a past or current intimate partner relationship is involved and there is a “manifestation of danger” by evidence of at least one of the following: (1) The officer believes that an assault or other violent act has occurred, whether or not there was probable cause for arrest; (2) the officer is concerned for the victim-survivor’s safety once they leave the incident scene; (3) the officer is responding to a domestic violence call from a victim-survivor or at a location where IPV has occurred in the past; or (4) the officer has a gut feeling that the victim-survivor is in danger.

If a victim-survivor screens in as “high risk,” which means an increased risk of homicide, the police officer responds proactively with the “Protocol Referral.” The police officer conveys to high-risk victim-survivors the danger that they are in — that people in similar situations have been killed. The officer calls the local 24-hour domestic violence hotline at the collaborating advocacy organization for information on planning for the victim-survivor’s safety and gives the victim-survivor the choice of speaking directly with the hotline advocate.

After initiating the call, the officer provides the hotline advocate with basic information that will help him or her develop safety suggestions for the victim-survivor. If the victim-survivor chooses not to speak on the telephone, the hotline advocate provides the officer with some immediate safety planning tips for the next 24 hours to share with the victim-survivor.

If the victim-survivor chooses to speak with the hotline advocate, the conversation is brief and focused, both because the officer must return to service and because the victim-survivor might not be in a position to absorb a great deal of information. Being on the phone with the victim-survivor at an IPV incident scene is a different type of call for a hotline advocate: Time is limited, and the victim-survivor might not have come to terms with the seriousness of the situation yet. Hotline counselors are trained to use special guidelines to (1) gain the victim-survivor’s trust, (2) reinforce the officer’s warning about the danger that the victim-survivor is in (and thus reinforce the partnership with law enforcement), (3) educate the victim-survivor and conduct immediate safety planning, and (4) actively encourage the victim-survivor to seek available services.

Using a Quasi-Experimental Design

Without random assignment to groups, the study became quasi-experimental; specifically, the study was a nonequivalent-groups quasi-experimental field trial. The groups were nonequivalent because there was no random assignment. Instead, we used a historical comparison group across a previous period.

To create a historical comparison group, we asked the police officers, before training them on the intervention, to refer IPV victim-survivors to researchers when the women evidenced a manifestation of danger (as outlined in the sidebar “A Closer Look at the Lethality Assessment Program”) and were willing to speak to a researcher over

the telephone. During the study interview, we administered the Lethality Screen but did not score it so that, during analysis, we could determine which women were at high risk and would be included in the comparison group (i.e., those not receiving the intervention). This ensured that high-risk victim-survivors who later received the intervention would be compared with high-risk victim-survivors who did not.

After we trained the police officers and the advocates on the intervention, the officers completed the LAP at IPV incident scenes and referred women to the study if the women were willing to have researchers contact them — whether or not the women answered the questions on the Lethality Screen, were determined to be high risk, or talked on the phone to an advocate.

Working With Institutional Review Boards

Institutional Review Boards (IRBs) ensure that research meets ethical guidelines and adheres to federal regulations. The involvement of research partners from numerous institutions and the collaborative nature of the study (e.g., research assistants in Arizona collected data from women in Oklahoma) made it necessary to involve five IRBs: Arizona State University, the Cherokee Nation, Johns Hopkins University, the Oklahoma State Department of Health and the University of Oklahoma Health Sciences Center. Each IRB interprets ethical and federal guidelines somewhat differently, but they all have the same goal: to ensure the ethical treatment of research participants. As we prepared for the start of the study, we needed to resolve several issues related to the protection of human subjects:

- Community partners did not understand IRB requirements and federal regulations. The police partners, for example, wondered why they had to read a specific statement when they asked participants whether they would like researchers to contact them. We explained how the requirement ensured that no woman felt coerced into participating, thereby protecting each woman's right to refuse participation in the research study.
- Although, as nurses and social workers, we were mandated to report child abuse by state law, the Department of Justice's confidentiality statute (42 USC 3789g) requires a separate consent form to allow reporting of current abuse when that abuse is revealed during data collection. Therefore, we used two consent forms: one for participating in the research and another that would allow us to report child abuse if it was revealed during an interview. This process protected the women's right to be informed about all study procedures and ensured that the women understood that we would have to report child abuse. We did not ask questions about child abuse during the interviews.
- Under federal regulations, pregnant women can be enrolled in a research study only if it directly benefits the mother or the fetus or if the research has no more than minimal risk.¹ We justified the inclusion of pregnant women in the study, arguing that their exclusion would deprive them of a potentially helpful intervention. We also provided all study participants, including pregnant women, with a packet of health-related resources (including domestic violence resources) after their second interview.

Because the project extended to so many different populations, we needed approval from all related IRBs. We therefore submitted the initial study application, annual continuing reviews, protocol modifications and adverse events through the five IRBs each time issues arose. Although this was cumbersome at times, it ensured the protection of all study participants, a goal that is of utmost importance in research studies, particularly those studies that include vulnerable populations such as intimate partner violence victim-survivors.

Notes

1. U.S. Department of Health and Human Services, "Chapter VI: Special classes of subjects," *Institutional Review Board Guide Book*, 1993, available at http://www.hhs.gov/ohrp/archive/irb/irb_chapter6.htm.

Thus, officers pre- and post-intervention used the same criteria to refer women to the study to ensure that the two groups were as similar as possible.

Because we used a historical comparison group, we needed to be particularly attentive to any changes that occurred in participating communities between

the times of recruitment of the comparison and intervention groups, such as a high-profile domestic homicide or the closing of a local shelter, because these might affect research outcomes. There were no events that led us to believe that the two groups would differ; however, without random assignment, there were no built-in assurances that they would be similar.

Indeed, the comparison and intervention groups differed in several ways. There were statistically significant differences between the comparison and intervention groups in marital status, immigration status and categories on the Danger Assessment (an IPV risk assessment). We controlled for these differences statistically in our data analysis. However, because participants were not randomly assigned to groups, differences may have existed between the groups that we did not measure and thus could not control statistically.

The risk that we faced with the quasi-experimental research design was that some difference between the groups that we did not measure led to more or fewer protective actions, help-seeking, or frequency and severity of violence among the intervention group but not among the comparison group. Were this to occur, we might have attributed these differences to the LAP when they should instead have been attributed to some other factor. For example, we do not know whether any woman in the comparison group would have agreed to speak with the hotline advocate had she received the intervention. Perhaps the intervention group had some unmeasured characteristic (that the comparison group did not) that affected the women's willingness to participate in the LAP, their decision to take protective actions or their experiences of violence. If that were the case, our research findings would be attributed to the LAP when they should be attributed to this characteristic.

Replication — that is, conducting a similar study with different participants in a different location or with different researchers — is one way to determine whether the results of a study are valid, reliable and generalizable.

- **Valid findings are accurate:** If researchers can replicate study results, then it is more likely that the results reflect real differences between groups or real changes due to an intervention.
- **Reliable findings are consistent:** The same or similar results are found again and again.
- **Generalizable results will translate to different locations and populations:** For instance, an intervention is effective in Oklahoma and Maryland, among Native American and African-American women, and so forth.

Currently, NIJ and the Office on Violence Against Women are collaborating to evaluate two lethality and high-risk assessment models, including the LAP. Two sites will implement the LAP and be rigorously evaluated over the next three to five years.

How Effective Is the LAP?

Our evaluation of the LAP found that women in the intervention group did, indeed, engage in more protective strategies both immediately after the intervention (e.g., seeking domestic violence services, removing or hiding their partners' weapons) and when we interviewed them approximately seven months later (e.g., applying for and receiving protection orders, obtaining something to protect themselves, seeking medical attention due to violence, going someplace where their partners could not find them). In addition, women in the intervention group had experienced significantly less frequency and severity of violence than women in the comparison group at the follow-up interviews.

To design and conduct this research study, we needed to balance the challenges of engaging in quasi-experimental field research against the requirements of a tightly controlled true experimental design. RCTs have the benefit of controlling for extraneous variables within the design itself and are therefore considered the gold standard for knowing whether an intervention is effective. However, as we discussed above, RCTs require a highly controlled research environment that was neither practical nor desirable in this particular case, which highlights that there is not a single approach to effectiveness trials. To maintain the

integrity of the LAP and meet the ethical imperatives of the researchers and community partners, a quasi-experimental design was necessary. Although this design opens the door to outside influences that could affect research outcomes, we believe that this pragmatic field trial provided the best possible information about the effectiveness of the LAP.

About the Authors

Jill Theresa Messing is an associate professor in the School of Social Work at Arizona State University.

Jacquelyn Campbell is a professor and the Anna D. Wolf Chair in the Johns Hopkins University School of Nursing. **Janet Sullivan Wilson** is an associate professor in the College of Nursing at the University of Oklahoma Health Sciences Center.

For More Information

To read the full report “Police Departments’ Use of the Lethality Assessment Program: A Quasi-Experimental Evaluation,” go to NIJ.gov, keyword: 247456.

Notes

1. IPV is defined here as rape, physical violence or stalking by a current or former intimate partner. Black, Michele C., Kathleen C. Basile, Matthew J. Breiding, Sharon G. Smith, Mike L. Walters, Melissa T. Merrick, Jieru Chen, and Mark R. Stevens, *The National Intimate Partner and Sexual Violence Survey: 2010 Summary Report*, Atlanta, Georgia: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, November 2011, available at http://www.cdc.gov/violenceprevention/pdf/nisvs_report2010-a.pdf.
2. Felson, Richard, Steven F. Messner, Anthony Hoskin, and Glen Deane, “Reasons for Reporting and Not Reporting Domestic Violence to the Police,” *Criminology* 40 (3) (2001): 617-648.
3. Virginia Department of Criminal Justice Services, *Review of Lethality Assessment Programs (LAP)*, October 2013, available at <http://www.postandcourier.com/tilldeath/assets/d1-25.pdf>.

4. Messing, J.T., J. Campbell, J.S. Wilson, S. Brown, and B. Patchell, “The Lethality Screen: The Predictive Validity of an Intimate Partner Violence Risk Assessment for Use by First Responders,” *Journal of Interpersonal Violence* (May 11, 2015) [epub ahead of print], available at <http://www.ncbi.nlm.nih.gov/pubmed/25969441>.
5. National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research*, Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1979, available at <http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html>.
6. For example, in the Minneapolis Domestic Violence Experiment, a seminal NIJ-funded randomized control trial on the effectiveness of arrest, officers delivered the intended intervention between 72.8 percent and 98.9 percent of the time, depending on the intervention assigned. Sherman, Lawrence W., and Richard A. Berk, “The Minneapolis Domestic Violence Experiment,” *Police Foundation Reports*, April 1984, available at <http://www.policefoundation.org/publication/the-minneapolis-domestic-violence-experiment/>.
7. American Nurses Association, *Code of Ethics for Nurses With Interpretive Statements*, Silver Spring, Maryland: American Nurses Association, 2010; and National Association of Social Workers, *NASW Code of Ethics (Guide to the Everyday Professional Conduct of Social Workers)*, Washington, D.C.: National Association of Social Workers, 2014.
8. Although the LAP had not been vigorously evaluated, the LAP had been implemented in at least 43 jurisdictions during 2007, the year before the study began. Today, hundreds of jurisdictions across 31 states are using the LAP. The Maryland Network Against Domestic Violence compiles information about participating jurisdictions. During 2007, 3,304 Lethality Screens were administered and 58.2 percent (1,923) of victim-survivors screened in as high risk. Of those victim-survivors who screened in as high risk, 53.6 percent (1,030) talked to the hotline advocate. Of those victim-survivors who talked to the hotline advocate, 25.5 percent (263) went into the collaborating domestic violence agency seeking services (Maryland Network Against Domestic Violence, Lethality Assessment Statistical Information, LAP Report, October 2008). Although experimental research looking at participant outcomes was needed, the research team believed that the available information indicated that the LAP was connecting women with needed resources.

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