

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](#), 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](#), 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](#), 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](#), keyword: 243875.

- Read an *NIJ Journal* article about the ballistics database evaluation, “Study Identifies Ways to Improve ATF Ballistic Evidence Program,” at [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](#), 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](#), 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](#), 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.



Photo sources: ©Fuse, Thinkstock; ©Bplanet, iStock;
©Photodisc, Thinkstock; ©TEK IMAGE/SPL, Getty
Images; ©gabricon, iStock.

NCJ 248782

Cite this article as: Browning, Katharine, "Social Science Research on Forensic Science: The Story Behind One of NIJ's Newest Research Portfolios," *NIJ Journal* 275 (2015): 40-47, available at <http://nij.gov/journals/275/Pages/social-science-forensics.aspx>.