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Wrongful Convictions

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Abstract

In response to wrongful convictions, there has been a revolution in criminal procedure and research in law and science. This review seeks to summarize the cross-disciplinary explosion in work studying known wrongful convictions, examining their causes, and assessing policy reforms designed to help detect and prevent errors in criminal justice. Scholars have increasingly studied the characteristics of known wrongful-conviction cases, including by analyzing archival records and by creating public registries of exonerations. Scholars have conducted research in law, psychology, statistics, criminology, and other disciplines, as well as interdisciplinary research, designed to better understand the phenomenon of wrongful convictions and how to prevent errors. Scientific bodies, such as the National Academy of Sciences, have made important recommendations based on this research. Furthermore, the conversation is global, with litigation, research, and policy work across jurisdictions. A wide range of jurisdictions have adopted noteworthy changes designed to safeguard crucial types of evidence, such as confession, forensic, and eyewitness evidence, during police investigations and at trial. As a result, law and science have increasingly come together to produce tangible improvements to criminal justice.

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INTRODUCTION

Judge Learned Hand famously called “the ghost of the innocent man convicted” an “unreal dream” (*United States v. Garsson* 1923). Today, the judges, prosecutors, and observers who had long claimed that “innocent men are never convicted” appear mistaken about the fundamental reality of a human criminal justice system that makes errors (Garrett 2011). Large numbers of exonerations in the United States—hundreds involving DNA testing conducted postconviction and thousands more not involving DNA—have prompted a criminal justice revolution, including a wholesale re-examination of rules that limited ability to raise new evidence of innocence as well as of investigative procedures that did not accurately collect or document evidence. Similar forces have prompted a new focus on accuracy in criminal justice and a range of policy changes in countries across the globe. Judicial opinions, academic research, criminal procedure reform legislation, changed post-conviction standards, new police practices focused on accuracy, new prosecution practices, and changes to legal education have all flowed from a renewed focus on innocence (Garrett 2017c).

Two broad areas of research into the nature of these wrongful convictions have influenced the understanding of how law and policy can improve the accuracy of criminal convictions. First, descriptive research has analyzed characteristics of known wrongful-conviction cases. Researchers have examined DNA exoneration cases due to their prominence and the clarity of the evidence of innocence in those cases. Postconviction DNA testing has proven over 360 men and women innocent; 20 had been sentenced to death but exonerated before any execution. Researchers have examined those cases; the Innocence Project in New York maintains a list of such DNA exonerations and describes their characteristics, and this author maintains a data registry and repository of materials concerning those cases [for a current count of such cases, see <http://www.innocenceproject.org/all-cases/#exonerated-by-dna>; for an in-depth study of the first 250 such cases, see Garrett (2011); for detailed data regarding DNA exoneration cases, see <http://www.convictingtheinnocent.com/>]. Additional research has studied still broader groups of exonerations. The best known such research in the United States is that reported by the National Registry of Exonerations, which documents 1,934 individuals who have been exonerated in the United States in just the past 20 years. [A current count of all exonerations may be found on the National Registry’s website (Natl. Regist. Exonerations 2019a).] A body of empirical research has now explored the facts underlying DNA exonerations in the United States.

The second body of research has focused on the causes of wrongful convictions. This research takes many forms and has involved research in different disciplines. Archival and descriptive research has not only examined the characteristics of exoneration cases but also detailed how evidence became altered or erroneous during the investigation and adjudication of those cases. Qualitative and sociological research has studied the attitudes and culture of actors that can produce wrongful convictions. Experimental research has tested mechanisms that can produce errors in criminal investigations. Theoretical research has examined sources for cognitive errors and statistical errors, for example, that underlie wrongful convictions. Thus, wrongful-conviction research has involved interdisciplinary contributions from criminology, genetics, law, neuroscience, psychology, and statistics, among the relevant fields.

Each of these fields of study has resulted in suggested changes that can, for example, improve the accuracy of eyewitness identification procedures, confession procedures, forensics used in crime laboratories, and investigations more broadly. Although responses to wrongful convictions differ widely across different jurisdictions, all legislatures in the United States have enacted statutes to permit broader postconviction access to new evidence of innocence, and many have improved procedures concerning interrogations, lineups, and other types of evidence. Still larger numbers of individual policing agencies have adopted changes, with national and international agencies endorsing changes and a new focus on accuracy in policing. Likewise, prosecutors have

created conviction integrity units tasked with reinvestigating closed cases. This review discusses characteristics of known exoneration cases, the research on wrongful convictions, and specific research focusing on particular ways to improve accuracy in order to prevent wrongful convictions. Finally, this review concludes by describing accuracy-based policy reforms flowing from this body of research.

THE RISE OF EXONERATIONS

Death Row Exonerations

“From this day forward, I no longer shall tinker with the machinery of death,” wrote Supreme Court Justice Harry Blackmun in 1994. Justice Blackmun added that “human error is inevitable,” and “our criminal justice system is less than perfect” (*Callins v. Collins* 1994a).

What about “the case of the 11-year-old girl raped by four men and then killed by stuffing her panties down her throat,” Justice Antonin Scalia raged in response. “How enviable a quiet death by lethal injection compared with that!” (*Callins v. Collins* 1994b).

The Justices were debating the cases of Henry McCollum and Leon Brown, two brothers sentenced to death in North Carolina. The North Carolina courts had reversed the brothers’ convictions in 1988 on appeal due to an error in the jury instructions. After new trials, in 1991 McCollum was sentenced to death again and Brown was resentenced to life in prison (*State v. McCollum* 1988). When McCollum’s case reached the Supreme Court in 1994, Justice Blackmun insisted that although the crime was “abhorrent,” there was “more to the story.” After all, McCollum had “an IQ between 60 and 69 and the mental age of a 9-year-old. He reads on a second-grade level.” Justice Blackmun wrote, “This factor alone persuades me that the death penalty in his case is unconstitutional” (*McCollum v. North Carolina* 1994). Yet the Supreme Court denied relief.

“Get to know Henry McCollum. He RAPED AND MURDERED AN 11 YEAR OLD CHILD,” screamed the political ads in North Carolina in 2010, attacking a “criminal coddler” candidate who supported a law to examine whether the death penalty was racially discriminatory. If that law passes, McCollum “might be moving out of jail and into your neighborhood sometime soon” (Neff 2014). The law did pass, but both the then-majority leader of the General Assembly and an attorney general candidate were defeated after being on the receiving end of these flyers (Boyle 2014). Decades later, McCollum’s case was still a poster child for death penalty supporters in North Carolina.

Yet in September 2014, a standing ovation shook the walls of the Robeson County courtroom, with relatives of Henry McCollum and Leon Brown weeping for joy. The judge had ordered their convictions reversed. A special guest sat in the room: Judge I. Beverly Lake Jr., who several years earlier had stepped down as Chief Justice of the Supreme Court of North Carolina. Before he retired, Judge Lake spearheaded the creation of the North Carolina Actual Innocence Inquiry Commission in 2007, an independent agency that investigates potential wrongful convictions, the first of its kind in the United States. The Center for Death Penalty Litigation had been pushing for years to get cigarette butts and other crime-scene evidence tested, but police had said for years that the evidence was all lost. In fact, the box had been sitting in storage. Once the commission took the case, the commission’s investigators tracked down the evidence box and conducted DNA tests. The tests cleared both brothers and implicated another man who had lived a block from the murder victim and had been convicted of another rape and murder in the town of Red Springs. On the basis of the DNA tests, the commission recommended that the court reverse both of their convictions. It had taken thirty years to finally set the brothers free.

All that happened in McCollum and Brown’s case is part of a familiar pattern. For decades, courts had assumed the brothers were guilty because they had confessed in detail to a brutal

murder. Yet we now know that the police, during lengthy and overbearing interrogations, had put words in their mouths. They were innocent and had no way of knowing how the crime happened. At trial, though, the jury heard the prosecutor and the detectives describe how the brothers had supposedly volunteered inside information that only the killers could have known. Although no other evidence connected them to the crime and they had no criminal records, they were sentenced to death.

Twenty individuals have been exonerated from death row in the United States on the basis of DNA evidence, and many more have been exonerated from death row on the basis of other new evidence of their innocence (Garrett 2017c). The system did not quickly recognize their innocence. Almost half, like McCollum and Brown, endured multiple criminal trials before DNA evidence exonerated them. Six had two trials and two had three criminal trials before their eventual exoneration. Eight cases involved eyewitness identifications, and sometimes multiple eyewitnesses who were all mistaken about what they had seen. Kirk Bloodsworth, from Maryland's death row, was the first to be exonerated: Five eyewitnesses had misidentified him. Fourteen cases involved forensic evidence, including a series of cases with unreliable and flawed forensics. Ten cases had microscopic hair-comparison evidence, a type so unreliable that the FBI and crime labs in several states are conducting full audits into decades of testing and testimony. Two more had quite similar fiber comparisons. Two had still more notoriously unreliable bite-mark comparisons, a type of forensics that the scientific community has stated should not be used to identify individuals until meaningful research is done to validate it. Some had more than one type of unreliable forensics. The crime-lab analysts, who typically worked for law enforcement, often described the forensics like smoking-gun evidence, telltale traces pointing straight to the murderer (Garrett 2017c).

In these cases, the evidence against innocent individuals seemed strong. In hindsight, we might think we would not have convicted them, and we would not have sentenced them, but the truly frightening prospect is that hearing the same evidence, any of us might well have done exactly what the jurors did in the cases of Henry McCollum and Leon Brown.

Criminal Procedure, Finality, and Accuracy

In the past, wrongful convictions were thought to be rare if not impossible occurrences. Justice Sandra Day O'Connor touted how "our society has a high degree of confidence in its criminal trials, in no small part because the Constitution offers unparalleled protections against convicting the innocent" (*Herrera v. Collins* 1993). Constitutional criminal procedure long reflected this traditional view in the United States, and internationally (Garrett 2017d). In ruling in *Herrera v. Collins* (1993), the US Supreme Court Justices declined to recognize a freestanding constitutional claim of actual innocence. The Court noted the "disruptive effect that entertaining claims of actual innocence would have on the need for finality," as expressed in the limitations periods that prevent late filing of new trial motions (*Herrera v. Collins* 1993, p. 417).

This sentiment extended beyond cases dealing directly with claims of innocence, as other criminal procedure rulings incorporated a view that reliability and accuracy of criminal judgments were not of central concern. The Supreme Court has not revisited the factors set out in *Manson v. Brathwaite* for examining eyewitness identifications tainted by police suggestion, despite decades of research showing how unreliable eyewitnesses can be (*Manson v. Brathwaite* 1977; see also *Perry v. New Hampshire* 2012). For almost as long, the Court has adopted a view that absent sufficient evidence of coercion, a highly unreliable confession statement is not of constitutional concern. Such questions of accuracy and reliability were relegated to state evidence law or police practices. Today, this body of state evidence law and police practices has rapidly begun to change, and constitutional criminal procedure may eventually follow.

Take the example of postconviction rules of finality, in which all jurisdictions in the United States experienced a complete change in those rules in the space of about a decade. All jurisdictions had some provision in place for a new trial based on newly discovered evidence, but most states had rules limiting introduction of such new evidence of innocence to a time period of one to three years or sometimes a much shorter period of time (in 1993, the Supreme Court reported in *Herrera v. Collins* that 17 states had limitations periods of less than 60 days, and 18 had limitations periods between one and three years) (*Herrera v. Collins* 1993). The federal rule requires that a motion based on newly discovered evidence be filed within three years, and it may only be granted “in the interest of justice,” if a new trial “would probably produce an acquittal,” and if prior diligence had been exercised in seeking such evidence, among other requirements (*United States v. Ortiz* 1994). In the 1990s, only two states, Illinois and New York, had statutes providing a right to access postconviction DNA testing (Garrett 2017c). Many of the people freed by DNA tests in the first decade and a half of its use waited years to obtain those DNA tests and relief. Clemency is one final avenue for those with evidence of factual innocence, but there has been a sharp trend toward declining grants of clemency applications (see Drinan 2012, Heise 2003). As DNA exonerations showed how powerful new evidence of innocence could come to light years and even decades after a conviction, the laws across the United States began to change (Garrett 2008a; see also Medwed 2005).

Judicial awareness of the problem of wrongful convictions has also dramatically changed. To give one example, in 2015, in the United States, six individuals were exonerated from death row, and Justice Stephen Breyer wrote an opinion calling for briefing of the issue whether the current practice of the death penalty is categorically unconstitutional, including because of evidence from such exonerations (Death Penalty Inf. Cent. 2015, *Glossip v. Gross* 2015). Thus, such reexamination has occurred at the Supreme Court level as well as at the state level, with several states reconsidering or abolishing the death penalty in part because of exonerations in death penalty cases (see Garrett 2017c).

WRONGFUL-CONVICTION RESEARCH

Descriptive Research

A body of descriptive research has long examined the characteristics of exoneration cases. Initially, much of that research was conducted in the United States, given the large numbers of exonerations documented in the American legal system and access to good criminal justice records even in older criminal cases. A large body of research documented wrongful convictions in the United States, including in extralegal lynchings and mob-dominated and racist trials, particularly in the South during slavery, Reconstruction, and Jim Crow. Many have studied the role that wrongful convictions in mob-dominated trials, like those of the Scottsboro Boys, played in the US Supreme Court’s growing role in regulating constitutional criminal procedure (Klarman 2000). Prominent scholars, lawyers, and authors described high-profile wrongful-conviction cases, ranging from the trial of Sacco and Vanzetti to the conviction of George Whitmore, all of which made important contributions to awareness of the possibility of error and adoption of reforms (Frank & Frank 1957, Frankfurter 1927, Raab 1967). Edwin Borchard’s classic book *Convicting the Innocent: Sixty-Five Actual Errors of Criminal Justice* documented a compilation of errors in criminal cases (Borchard 1932). Such research is increasingly common globally, with documentation of wrongful convictions, for example, in Canada (Denov & Campbell 2005), France, England and Wales, Israel, the Netherlands, and Poland (Huff & Killias 2008). There are also many more legal organizations dedicated to representation in potential wrongful-conviction cases (Godsey 2017). There is now an Innocence Network of innocence projects working in the United States and

indeed across the globe, including in Argentina, Australia, Brazil, France, Ireland, Israel, Italy, the Netherlands, Taiwan, and the United Kingdom (<https://innocencenetwork.org/>) as well as a related European Innocence Network and Red Inocente (<https://redinocente.org/>), a Latin American network.

Studies of Exonerations

One recent body of research has focused on DNA exonerations. In my book *Convicting the Innocent: Where Criminal Prosecutions Go Wrong*, I reported a set of studies of the first 250 DNA exonerations (Garrett 2011). In these cases, the average length of time from conviction to exoneration was 14 years (see Innocence Proj. 2018, Medwed 2017). Most of the DNA exonerees were convicted of rape, with some convicted of murder. Twenty were sentenced to death. Data concerning DNA exonerations, as collected in that research and documented on the Innocence Project website, have been broadly cited and have impacted courts, policy makers, and the media.

Recent research has also focused on a broader set of exonerations, including non-DNA exonerations. Early research on wrongful convictions examined a broad range of new evidence involved in exonerations. In some of that work, the focus was on wrongful convictions defined in different ways, and there had been debates about how well the researchers identified cases involving innocent convicts because questions of innocence and guilt cannot always be conclusively resolved on the basis of available evidence. Such research has focused on exonerations defined legally and procedurally, focusing on whether the court or executive vacated the conviction on the basis at least in part of newly discovered evidence of innocence (Nat'l. Regist. Exonerations 2019b).

Professor Samuel Gross began to study exoneration cases, including non-DNA cases, and his work led to the creation of the National Registry of Exonerations, which now details such cases from 1989 to present. Eight percent of those known exonerations occur in cases in which defendants were sentenced to death. Approximately 20% of the Registry cases include false confessions, and 28% involved false or misleading forensic evidence. Still more involved some form of witness perjury, false accusation, or official misconduct. As of 2016, 21 of 116 death row exonerations on the National Registry involved false confessions, 32 involved false or misleading forensics, 81 involved perjury or false accusations, and 90 involved official misconduct. Such research has increasingly been conducted in other countries. Professors Lena Zhong and Mengliang Dai, for example, have studied a set of 206 defendants wrongly convicted in China (Zhong & Dai 2018). In recent years, studies of exonerations have also been conducted in Japan (Johnson 2015) and Germany (Leuschner et al. 2019).

Estimating Prevalence of Wrongful Convictions

Research in criminology has sought to estimate the prevalence of wrongful convictions. Some of that research has involved extrapolation from known exonerations, which is limited by the selection of those cases and the factual and procedural barriers to obtaining legal exonerations. Sam Gross and colleagues have used statistical methods to estimate wrongful convictions and their prevalence in capital cases (Gross et al. 2014). In recent work, Charles Loeffler, Jordan Hyatt, and Greg Ridgeway have conducted self-report surveys of prisoners to assess how many have claims of innocence, estimating a six percent wrongful-conviction rate (Loeffler et al. 2018). Gisli Gudjonsson and colleagues have performed large scale surveys in Europe regarding self-reported juvenile false confessions (Gudjonsson et al. 2010). Allison Redlich, Alicia Summers, and Steven Hoover have conducted self-report studies of false confessions and guilty pleas among mentally ill offenders (Redlich et al. 2010).

Research on Causes of Wrongful Convictions

Additional research from an array of disciplines explores the causes of wrongful convictions. Archival and descriptive research has not only examined the characteristics of exoneration cases but also detailed the sources of error in those cases. Experimental research, including psychological studies, has tested mechanisms that can produce errors in criminal investigations, including by studying how mock jurors evaluate the presentation of trial evidence, examining the accuracy of work by forensic analysts, and examining the effects of pressure on individuals to confess. Theoretical research has examined cognitive errors and statistical errors underlying wrongful convictions, and major reports from the National Academy of Sciences have provided the framework for large-scale research agendas and reform. Below, I describe how wrongful-convictions research has involved interdisciplinary contributions from the social sciences, statistics, and law by focusing on several of the key areas in which such research has been conducted.

Eyewitness Misidentifications

Psychological research studying eyewitness memory predated the innocence movement by several decades, and beginning in the 1970s, psychologists embarked on memory research that would transform our understanding of human memory. They uncovered how a police lineup, designed to take some care to test the memory of an eyewitness, can actually reshape and alter an eyewitness's memory. However, the experience of hundreds of DNA exonerees, whose cases heavily involved eyewitness errors, powerfully emphasized the importance of taking eyewitness memory research seriously and improving the way that lineups are conducted. Prompted by the experience of those exonerations and the decades of research, involving thousands of studies, the National Academy of Sciences produced a detailed report in 2014, informed by neuroscience, social science, and statistics, that set out best practices for policing agencies, recommendations for courts, and a research agenda for further eyewitness memory research (see Natl. Res. Council. 2014). Crucial recommendations included that all eyewitness identification procedures use clear, standardized instructions, that eyewitness identifications are conducted blind so that the administrator does not know which is the suspect, that the confidence of the eyewitness is documented, and that the entire procedure is video recorded (Natl. Res. Council. 2014). The American Law Institute Principles of Policing project has endorsed each of these procedures (Am. Law Inst. 2019). Although prior surveys suggested that adoption of these practices was highly uneven, recent evidence points toward increased adoption by agencies (Garrett 2019). In addition, courts have become far more receptive to expert testimony on the subject of eyewitness memory (Natl. Res. Council. 2014). In recent years, several state courts have also adopted more wholesale revisions of the standards for admitting eyewitness evidence and informing jurors concerning its limitations (Natl. Res. Council. 2014).

Forensic Evidence

Scholars have increasingly studied the role that faulty forensic evidence has played in wrongful convictions. For example, Simon Cole (2006) has detailed the role of error in latent fingerprint comparisons. Others have documented the role of error in a range of forensic disciplines or in laboratories more broadly.

The experience of exonerees, who were freed by DNA testing but who were (more often than not) convicted on the basis of false or even falsified forensics, powerfully affected the forensics community as well. Of the first 330 DNA exonerations in the United States, 71%, or 234 cases, involve forensic testimony (see Garrett 2011, Garrett & Neufeld 2009). The bulk of these DNA exoneree trials included serology of pattern-matching forensics, not DNA testing, and much of

that evidence was vaguely presented or presented in an outright erroneous or overstated manner. Of the 234 cases, 54%, or 126 cases, involved invalid, erroneous, or concealed forensics. Twenty-eight cases involved concealed and exculpatory forensic evidence that could have supported a claim of innocence at trial if it had been disclosed to the defense. Twenty-nine of the cases involved analysis that was erroneous, including because of lab errors and expert misconduct. Of the remaining cases, which did not involve invalid, erroneous, or concealed evidence, an additional 19 cases involved vague testimony that evidence such as hairs or fibers or bite marks was similar or consistent with that of the defendant. Well over half of these DNA exoneration cases—at least 62%, or 145 of the 234 cases—involved invalid, erroneous, concealed, unreliable, or vague presentation of forensics (Garrett 2011).

In response, scholars increasingly called for wholesale reforms of forensics, including crime labs independent of law enforcement, scientific standards for reaching forensic conclusions, studies of error rates, and efforts to combat cognitive bias, as well as an end to the most unreliable forensic techniques. Those calls were echoed in 2009 by an influential National Academy of Sciences report concluding that “with the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source” (Natl. Res. Council. 2009).

Seven years later, the 2016 report by the President’s Council of Advisors on Science and Technology (PCAST) issued a report highlighting that little had changed and more strongly stating that several forensic techniques should no longer be used in court until sufficient scientific research is done to validate their accuracy and reliability (Pres. Council. Advis. Sci. Technol. 2016). That report also highlighted the need for information about error rates in forensic disciplines and proficiency of particular examiners and laboratories (Pres. Council. Advis. Sci. Technol. 2016). The report added that “courts should never permit scientifically indefensible claims such as: ‘zero,’ ‘vanishingly small,’ ‘essentially zero,’ ‘negligible,’ ‘minimal,’ or ‘microscopic’ error rates; ‘100% certainty’ or proof ‘to a reasonable degree of scientific certainty’; identification ‘to the exclusion of all other sources’; or a chance of error so remote as to be a ‘practical impossibility’” (Pres. Council. Advis. Sci. Technol. 2016, p. 19). The National Commission on Forensic Science has similarly recommended that no examiner use “reasonable scientific certainty” conclusions (Natl. Comm. Forensic Sci. 2013).

Research from several disciplines has aimed to redress some of the flaws in forensics. For the first time in some disciplines, careful studies have attempted to estimate error rates (Ulery et al. 2011). A new generation of statistical work has examined whether machine learning or more sophisticated statistical models can provide a sound empirical basis for traditional pattern-matching forensics such as fingerprinting or ballistics that have involved subjective and not quantitative conclusions in the past (see Petraco et al. 2012, Spotts et al. 2014). A new generation of psychological work has examined cognitive-bias issues in forensics, including how a range of biases in information and practices can alter the conclusions that forensic analysts reach (see Dror et al. 2006, Dror & Hampikian 2011). That research has impacted approaches toward forensic science in jurisdictions around the world (see Forensic Sci. Regul. 2015). Studies of jury decision-making have examined how well fact-finders understand and how they evaluate the conclusions that forensic examiners reach, which in the past were often highly confident and exaggerated (Garrett & Mitchell 2013, Koehler 2017, Koehler et al. 2016, Lieberman et al. 2008). Some of that research has already led to recommendations regarding how forensic conclusions should be expressed, and changed the practices of testifying experts (US Dep. Justice 2019, Thompson et al. 2017).

False Confessions

In the first 21 years of postconviction DNA testing, 250 innocent people were exonerated, 40 of whom had falsely confessed (see Garrett 2010, 2011). In just the past five years, there have been 26 more false confessions among DNA exonerations. In general, false-confession cases have been concentrated in cases involving a murder—20 had been sentenced to death. In the entire group of 66 exonerees who falsely confessed, 42 involved a rape and a murder, 9 a murder, and 15 a rape (Garrett 2015; see also Garrett 2011). The cases involved lengthy interrogations that took place for more than three hours, with few exceptions, and many exonerees waived their *Miranda* rights when they were questioned by the police. Also, 94% of false confessions by DNA exonerees to date were contaminated by allegedly inside information. Almost without exception, these confession statements were contaminated with crime-scene details, which in retrospect, could not have been known until the individuals being questioned learned of them from law enforcement (see Garrett 2011, 2015). Additional exonerees had been questioned informally by the police, outside of an interrogation room, and were reported to have made inculpatory statements.

Data on false confessions, including in studies of non-DNA exonerations and large-scale surveys of juveniles in the United States and Europe, reveal disproportionate numbers of young people and individuals with disabilities make such confessions (see Drizin & Leo 2004; see also Candel et al. 2005, Gudjonsson et al. 2006, Redlich & Goodman 2003). In a group of 66 false confessions, for example, one-third, or 22, were juveniles, and at least 20 had an intellectual disability or were mentally ill (see Garrett 2015, 2017b). The American Law Institute is currently drafting a Restatement on Children and the Law that will address juvenile interrogations, including videotaping such interrogations (Am. Law Inst. 2016). The American Law Institute Principles of Policing project has endorsed the recording of interrogations and use of less coercive police questioning practices (Am. Law Inst. 2019). Policing agencies have increasingly shifted toward requiring recordings of interrogations (Int. Assoc. Chiefs Police 2013, Kassir et al. 2007).

Appeals and Postconviction Litigation

An earlier study of appellate and postconviction litigation by DNA exonerees found that court opinions written before DNA exonerated the individuals concluded with some regularity that errors asserted by the later-exonerated defendants were harmless or otherwise failed to demonstrate prejudice because of overwhelming evidence of guilt (Garrett 2008b). Evidence of innocence sufficient to persuade judges and executive actors to grant relief rarely surfaces until many years after convictions become final and the initial rounds of postconviction review are exhausted. Almost one-third of the first 250 people exonerated by DNA brought such claims (see Garrett 2011). They rarely succeeded, although about half of the exonerees who did obtain reversals of their convictions before they were exonerated by DNA testing did so based in part on prosecutorial misconduct and concealed exculpatory evidence (see Garrett 2011). However, in response to these cases, all states and the federal government have enacted new postconviction DNA testing claims and revised standards for asserting newly discovered evidence of innocence (Garrett 2017d). A wide range of jurisdictions around the world, including large and small countries and civil-law and common-law countries with very different systems, have similarly done so, often in response to high-profile exonerations (see Garrett 2017d).

Accuracy and Policing

Although police manuals have long contained detailed information concerning the constitutional law of search and seizure, they typically lacked the same attention to rules designed to promote

reliability in investigations. A 1990s study of police manuals from six states found that “none of the training materials addresses the importance of investigating, recording, or reporting exculpatory facts to avoid punishment of a possibly innocent arrestee” but rather they “reflect a psychological set in which the arrestee’s guilt is presumed, and the only use of notes and reports in the criminal process is to ensure conviction” (Fisher 1993, p. 30). Police departments increasingly focus on accuracy, both in procedures and in responses to errors, by considering scientific research and conducting risk assessments and sentinel events analysis when evidence does go wrong. This approach is recommended by leading organizations such as the International Association of Chiefs of Police and the Presidential Task Force on Twenty-First Century Policing (Int. Assoc. Chiefs of Police 2013). Recent research has also focused on cognitive bias and its role in error; for example, officers analyzing evidence from crime scenes can be vulnerable to cognitive and contextual bias (Natl. Res. Counc. 2009). The American Law Institute Principles of Policing Project adopts such recommendations by stating that investigations should, among other goals, generally focus on achieving accuracy, including specifically by recording evidence such as interrogations, and using best practices for eyewitness identifications (Am. Law Inst. 2019).

The Role of Prosecutors

An Innocence Project study found that 37% of the DNA exoneration cases involved the suppression of exculpatory evidence, 25% involved the knowing use of false testimony, and 11% involved the undisclosed use of coerced witness testimony (Scheck et al. 2003). Subsequently, those allegations regarding concealed evidence resulted in 24% of those convictions being overturned (see West 2010). A similar pattern can be observed among death penalty cases generally and not just those that eventually resulted in exonerations from death row, in which as many as one-fifth resulted in reversals due to concealed exculpatory evidence that came to light years after the conviction and death sentence (see Liebman et al. 2000). Of course, evidence that is not disclosed to the defense (and perhaps not even to prosecutors) may never come to light. We have no way of knowing just how common such discovery and constitutional violations are in practice. Indeed, most cases are plea-bargained and discovery may be more informal and limited.

Plea bargaining and its largely unregulated procedures contribute to wrongful convictions (Alschuler 2016). Guilty pleas by the innocent may often go undetected, including because persons who plead waive their rights to appeal or postconviction review, and they may be barred from later obtaining exculpatory evidence such as DNA. Each of those studies—showing how serious discovery violations occur in high-profile wrongful convictions and in the most serious capital cases, and how innocent people feel pressure from prosecutors to plead guilty—lends support to further work aimed at improving criminal discovery and the adjudication process. Such work has also created more interest in studying how tunnel vision and other cognitive biases play a role in decision-making by police and prosecutors in criminal cases (Ask & Granhag 2007, Findley & Scott 2006). For example, psychologists Saul Kassin, Itiel Dror, and Jeff Kukucka describe not only how an actor may be biased by outside information and other factors but also how the conclusions reached by, say, a forensic analyst may bias others in the criminal justice system (Kassin et al. 2013). However, procedures can be instituted through policy to improve the flow of information to officers and selectively blind them to irrelevant and potentially biasing information (Dror 2016).

Preventing Wrongful Convictions

In its 2009 report, the National Academy of Sciences recommended that a comprehensive regulatory approach be adopted for our entire system of forensics, including oversight by a National

Institute of Forensic Science that would promulgate scientific standards, audit labs, and conduct basic research to shore up forensic disciplines (see Natl. Res. Counc. 2009). Although legislation has been introduced in Congress, no such agency has been created. However, federal agencies have improved their funding and support for basic research to support forensics. The National Commission on Forensic Science has supported efforts to consider scientific standards for forensics.

Nevertheless, highly unreliable forensics continue to be used. Scientific standards are still needed for a wide range of forensic disciplines. Quality controls at labs are still lacking, and large-scale scandals involving lab errors persist. Indeed, new unreliable forensic techniques continue to be introduced, and new errors from low-copy DNA, poor interpretation of DNA mixtures, use of field drug tests of uncertain reliability, use of new algorithms for facial recognition without scientific testing, and other uses of proprietary and unvalidated technology raise a host of new challenges. Still, some labs have adopted independent scientific oversight and created new quality controls, such as blind proficiency testing and blind verification. Researchers have conducted more black-box studies, or at least a few more, that begin to document error rates in forensic disciplines. Far more needs to be done.

In fall 2014, the National Academy of Sciences published an important report titled *Identifying the Culprit: Assessing Eyewitness Identification* (see Natl. Res. Counc. 2014). The report evaluated decades of research on eyewitness memory, and it details scientific procedures that can help prevent error. Those recommended procedures include conducting identifications blind or blinded so that the person running the procedure cannot inadvertently signal the answer. More agencies are improving their eyewitness-identification procedures. In 2017, the US Department of Justice adopted a set of guidelines on the best practices for federal law enforcement agencies. More state courts have recognized the importance of the issue and ruled that jurors should hear from experts who can explain eyewitness memory issues to them or alternatively offered model jury instructions detailing the sometimes-counterintuitive research on eyewitness memory. More research needs to be done to examine how to best present that science to jurors. Many more police agencies need to use blind lineups and record and carefully document lineup procedures. And more research needs to be done on new possibilities for assessing eyewitness reliability.

In the area of false-confession research, an important white paper from the American Psychology and Law Society lays out a set of reforms to prevent contaminated and false-confession statements. Most important is that the entire interrogation is videotaped (see Kassin et al. 2010). However, more research and policy are being directed at considering less coercive models for police interrogation in the United States and in a range of jurisdictions around the world (see Miller et al. 2018). The PEACE interrogation methods first used in the United Kingdom, and now used in Australia, Denmark, New Zealand, Norway, Sweden, and other countries, adopt an investigative interviewing approach geared toward obtaining rapport and maximizing the amount of information gathered (Trainum 2016). Those concerns also extend to the use of police informant and other incentivized witnesses who claimed to have overheard inculpatory statements in DNA exoneration cases. Far more research needs to be done to examine how to safeguard informant testimony if it is to be permitted.

How do jurisdictions consider making such changes? Take the case of Timothy Cole, convicted in 1986 and exonerated by DNA testing in 2010. He was exonerated 11 years too late; he died in prison in 1999. But Texas is now a poster-child state for reforms to prevent wrongful convictions. Lawmakers convened a Timothy Cole Advisory Panel on Wrongful Convictions. In 2011, that commission recommended an entire platform of reforms. Most have since been enacted. Texas adopted a law requiring all police to use best practices for eyewitness-identification procedures, a law broadening access to DNA testing, and a statute to permit postconviction challenges based on changed science. A Texas Forensic Science Commission made recommendations and conducted

audits of old cases involving potentially erroneous forensic evidence. The Michael Morton Act (Tex. Code Crim. Proc. Ann. Art. 39.14), named after another Texas DNA exoneree, adopted in 2013, requires broad and shared discovery in criminal cases (see also Morton 2014). The Timothy Cole Exoneration Review Commission in 2016 recommended still additional changes, including that interrogations be recorded (Smithee et al. 2016). If one had a scorecard for states' adoption of measures to improve the accuracy of criminal cases, Texas would now score fairly high on the list. For a detailed survey of legislation designed to prevent wrongful convictions, regarding eyewitness evidence, forensics, and interrogations, enacted at the state level as of 2016, see Norris et al. (2017).

CONCLUSION

Perhaps the growing body of interdisciplinary research aimed at preventing wrongful convictions and the spread of criminal procedure reforms can be of some comfort to the innocent people who suffered for so many years in prison for crimes they did not commit. There are many paths toward adoption of the improvements described in this review. In many states, lawmakers have enacted legislation after study commissions initially examined the causes of wrongful convictions, familiarized themselves with the research discussed here, and then adopted responses. In other jurisdictions, it was law enforcement agencies that led the way by changing their policies. In some places, it was the courts that adopted rules to address accuracy concerns.

New types of errors that come to light as well as new research will continue to suggest new types of reforms. New research regarding sentencing errors, misdemeanor justice, bail decisions, mental-health diversion, juvenile justice, and many areas discussed in this volume will produce changes that can promote accuracy. New research regarding eyewitness memory, forensic science, and cognitive science research may produce still more improvements in the years ahead. DNA exonerations placed the United States at the forefront of using science to improve the accuracy of criminal justice.

The same practical problems have driven reform across a host of very different jurisdictions. Indeed, outside the United States, a range of civil- and common-law countries have similarly experienced exonerations in recent years and have also responded by adopting reforms, from new postconviction rules to new interrogation methods (for an overview, see Garrett 2017d). There is increasingly an international dialogue among researchers, innocence projects, and policy makers regarding the causes and cures for wrongful convictions. Wrongful convictions provide us all with an opportunity to improve the accuracy of criminal justice.

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