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Forensic Science and Miscarriages of Justice

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Synonyms

Criminalistics; Wrongful convictions

Overview

The relationship between forensic science and miscarriages of justice is complex and paradoxical. Miscarriages of justice are, in a sense, fundamentally unknowable. Forensic science, in the form of postconviction DNA testing, is the data source of much of the little we do know – and much of what we feel we know most securely – about miscarriages of justice. At the same time, forensic science has emerged from those very data as a significant contributor to miscarriages of justice.

Conceptual Framework

"Forensic science" is a broad term encompassing a variety of different techniques for using physical evidence in the investigation of crime. Forensic techniques include document examination, toxicology, pathology, drug analysis, print analysis, impression evidence, hair, fibers, paint, glass, soil, entomology, arson and explosives, gunshot residue, materials analysis, "jigsaw" physical fit matching, ballistics, blood spatter, crime scene reconstruction, computer forensics, serology, and DNA profiling.

"Miscarriages of justice" is an ambiguous term, more commonly used in the UK than elsewhere, that "can be defined in many different ways and nearly in whatever way one wishes" (Nobles and Schiff 2000). For scholars who construe the term broadly, a miscarriage of justice is any legal outcome in which the result is not just. Thus it may include both the conviction of factually (or "actually") innocent persons ("wrongful conviction") and the acquittal of factually guilty persons ("wrongful acquittals"). It may also include the conviction of legally, though not factually, innocent persons, those whom the state was not able to prove guilty to the appropriate legal standard. Arguably, it may also include much broader categories of injustice, such as excessive or insufficient punishments, unfair procedures, or unjust outcomes of nontrial procedures: pretrial detentions, plea bargains, failures to prosecute, dropped charges, closed investigations, and so on. In this sense, "miscarriage of justice" is a broader category than "wrongful convictions," a term with which it is often used almost interchangeably (Huff and Killias 2008). These ambiguities have inspired some commentators to propose alternative conceptual terminology such as "errors of justice," "false

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convictions," "actual innocence convictions," "unlawful convictions," and "truly innocent persons," none of which has really caught on. This entry primarily employs the generic term "miscarriages of justice," while occasionally referring to "wrongful conviction" or "wrongful acquittal" to designate particular types of miscarriage.

"Wrongful convictions" include at least three categories of cases: the conviction of the factually innocent, the conviction of the factually guilty but legally innocent, and the conviction of the factually guilty through procedures tainted by judicial error (Risinger 2007). Factual innocence (one did not commit the crime) is not the same as legal innocence (the state has not proved one guilty by the appropriate legal standard), though they are often conflated by the public (Nobles and Schiff 2000). The legal terms "convicted" and "acquitted" are not necessarily coterminous with the commonsense terms "guilty" and "innocent," and a trial, strictly speaking, is not concerned with determining "innocence," though its determinations do often come to be equated with innocence, or the lack of it, socially. For scholars with a narrower, legalistic definition of "miscarriages of justice," the procedurally tainted conviction of a factually guilty person would be a miscarriage of justice, but not a "wrongful conviction" (Naughton 2007). Most miscarriages of justice scholars, however, are primarily concerned with the conviction of the factually innocent.

A further complication is how to define "factual innocence." One approach is to rely on the courts, possibly supplemented by the findings of official inquiries or commissions, leading to the rather unsatisfying position that "miscarriages of justice are whatever appellate courts say they are" (Edmond 2002). The position is unsatisfying because courts are stingy about bestowing legal exoneration upon appellants, and many individuals claiming factual innocence are released from prison under procedural rulings, diversion from formal prosecution, or even guilty pleas – thus, without official findings of innocence. Another approach, then, is for external observers to try to make objective determinations of factual innocence. Inevitably, however, such determinations will be open to dispute by other observers. On very rare occasions, extra-legal events may provide strong epistemic authority for labeling something a "wrongful conviction," the classic example being the unexpected reappearance, alive and well, of a supposed homicide victim.

If we focus on the conviction of the factually innocent, a miscarriage of justice is the worst possible outcome of a legal procedure, producing the exact opposite of what it was intended and expected to yield: the awesome power of the state to punish has been deployed against a person undeserving of that punishment. In cases in which a crime undoubtedly occurred, the wrongful conviction is often accompanied by a collateral miscarriage of justice: the failure to punish the true perpetrator. Further adverse side-effects may include damage to the legitimacy of the courts and other criminal justice institutions. Because such outcomes are so manifestly unjust, they have often captured public attention. Such attention always operates on both a personal and a systemic level. In other words, miscarriages of justice are perceived as personal tragedies, but they are also generally perceived as symbolic of justice system failures (Nobles and Schiff 2000).

As an empirical topic, miscarriages of justice are notoriously difficult to investigate. Scholars, criminal justice system actors, and policymakers would especially like answers to two empirical questions about miscarriages of justice: (1) Prevalence: How frequent are they? (2) Causation: What proportion of blame for their occurrence should be assigned to what causes? Unfortunately, satisfying answers to these questions have been impeded by methodological stumbling blocks, of which two are paramount. First, miscarriages of justice are in a fundamental sense unknowable events since, by definition, they are events in which our primary determinant of truth, the criminal justice system, has produced falsehood and labeled it truth (Simon quoted in Gould and Leo 2010). As Gross (2008) notes, "We can't study an event if we can't tell when it happens. This is a severe problem for false convictions since, by definition, we don't know when they occur." What we can study, instead, is a small number of miscarriages of justice that have been

exposed – been made known to the public. However, everything we know about exposure suggests that exposure is a fortuitous, rather than a systematic, process. Therefore, we do not know the proportional relationship between exposed and actual miscarriages of justice. A second major methodological headache is that the mechanisms typically exposing miscarriages apply to actual cases in a skewed, rather than a representative, fashion. Known miscarriages are skewed toward those serious crimes which attract the greatest legal, media, and public attention. Serious crimes, carrying longer prison sentences, present more time, as well as greater incentives, for the parties to pursue every avenue of redress. The most powerful exposure mechanism of all, post-conviction DNA profiling, is skewed toward a specific set of convictions, primarily rape-murders, that occurred during a specific historical period, disproportionately based on specific types of evidence (Gross 2008; Schiffer 2009; Simon quoted in Gould and Leo 2010; Natapoff 2012). It may be possible to make empirical generalizations about that set of cases, but whether and how to extrapolate from that data set to all relevant cases remains a contentious matter of judgment (Risinger 2007).

What, then, might these two phenomena, "forensic science" and "miscarriages of justice," have to do with one another? Forensic science is used as evidence in criminal prosecutions, and, as such, it may contribute to wrongful convictions. It may do so by erroneously implicating an innocent suspect, for a variety of reasons. Or, it may do so by failing to exculpate an innocent suspect. At the same time, forensic science may also be responsible for averting wrongful convictions by exculpating, or failing to implicate, innocent suspects when they fall under suspicion. Likewise forensic science might contribute to wrongful acquittals by failing to implicate, or even exculpating, a guilty suspect. Or, it may avert wrongful acquittals by implicating guilty suspects. Figure 1 summarizes these possibilities schematically by conceptualizing forensic science as an "independent check" on police investigators' theory of the crime. Of course, as noted above, "forensic science" is a general term encompassing a variety of techniques; the performance of different techniques in this scheme may well vary greatly.

Historical Relationship Between Forensic Science and Miscarriages of Justice

Historically, forensic science and miscarriages of justice were rarely discussed in concert. Certainly forensic science has been cited as a contributor to miscarriages of justice since as long ago as the Dreyfus case. But, until recently forensic science has tended to take a back seat in discussions of miscarriages of justice, compared to other issues like eyewitness identification, perjury, official misconduct, and interrogation practices (Roberts and Willmore 1993). Although the earliest US study of miscarriages of justice mentioned "[t]he unreliability of so-called 'expert' evidence" as a contributor to wrongful convictions (Borchard 1942), most of the early American studies which attempted to systematically identify causes of wrongful conviction discussed eyewitness identification, false confessions, police and prosecutorial misconduct, bad lawyering, race, failures of the discovery process, and public pressure for a conviction, but made scant mention of forensic science. Radelet et al. (1992) was a notable exception, discussing the use of misrepresented serology and hair evidence to leverage false confessions and misleading medical examiner testimony. As Schiffer and Champod (2008) observed, "forensic science (to convict and to exonerate) is underrepresented and often wrongly understood in research concerning wrongful convictions."

This disjunction between forensic science and miscarriages of justice made intuitive sense because the characteristics popularly associated with "science" would seem to be the antitheses of the characteristics of miscarriages of justice. Miscarriages of justice were thought to be caused by unclear, misguided, or fallacious reasoning, but science is supposed to embody clear, logical reasoning from valid, empirically demonstrable

premises. Miscarriages of justice were thought to be caused by unjustified biases against people of certain races or classes, against persons with prior criminal records, or even simply against the police's preferred suspect, but science is supposed to be objective and free of bias. Miscarriages of justice were supposed to be caused by deceitful and otherwise unreliable information from witnesses, informants, co-conspirators, and the like, but science, goes the truism, "never lies." Miscarriages of justice were supposed to be caused by evidence that was less reliable than it appeared, like eyewitness identification evidence, but the very notion of science is associated, in the popular imagination, with high reliability, indeed often with certainty. For these reasons the notion that forensic science might contribute to miscarriages of justice is often treated as ironic because of the popular association of science with notions of "truth" and "certainty." Of course, any sober assessment should clearly understand that forensic techniques, like any other detection system, should be expected to yield errors – both "type I" and "type II" – at some rate (see Fig. 1). And yet, much discourse surrounding forensic science invokes popular stereotypes of science as "certain" in a way that other evidence is not.

The Rise of Forensic Miscarriages of Justice

The discourse on forensic science and miscarriages of justice changed dramatically during the 1990s. In large part this was due to the development of forensic DNA profiling in the mid-1980s, as will be discussed further below. However, even without DNA profiling, enough dramatic miscarriages of justice were exposed during the 1990s to generate a sense of a miscarriage of justice "crisis" (Nobles and Schiff 2000). In the UK, for example, this "crisis" was prompted by alleged miscarriages of justice in a series of Irish Republic Army (IRA) bombing cases, including the 1970s convictions of the "Guildford Four," "Birmingham Six," and "Maguire Seven," some of which involved explosive residue evidence (Nobles and Schiff 2000). Two official inquiries prompted by these cases highlighted the role of forensic science in miscarriages of justice. The 1993 Runciman Report of the Royal Commission on Criminal Justice discussed a number of issues concerning forensic science, including failure to adhere to objectivity and impartiality, problems with interpretation of evidence, failure to communicate findings clearly, inequalities between defense and prosecution resources, defense access to samples, pro-prosecution bias, expert shopping, quality control issues, and the low accuracy of the residue detection techniques themselves (Edmond 2002). In 1994, the "May Inquiry" discussed the role of forensic science in the Guildford Four and Maguire Seven cases. The May Inquiry primarily blamed individual forensic scientists for the failings of forensic science (Edmond 2002). It has been observed that these cases could only be construed as miscarriages of justice by placing the same sort of faith in the *exonerating* scientific analyses that was – now, supposedly erroneously – initially placed in the *incriminating* forensic analyses (Edmond 2002). While these cases forged a connection between forensic science and miscarriages of justice, the most dramatic role in drawing attention to miscarriages of justice, especially in the US, came to be played by forensic DNA profiling.

Forensic DNA Profiling

The earliest use of forensic DNA profiling, in the investigation of two rape-murders in the English village of Narborough for which Colin Pitchfork was eventually convicted, arguably helped avert a miscarriage of justice in that the DNA evidence exonerated an individual who had emerged as the prime suspect and falsely confessed. Post-conviction DNA testing has exposed hundreds of miscarriages of justice in the US, beginning with the cases of David Vasquez, and then Gary Dotson, in 1989. These were both rape-murder cases in which physical evidence (hair and semen, respectively) presumed to derive from the assailants was recovered and implicated the

defendants. However, post-conviction forensic DNA profiling on biological samples presumed to derive from the assailants excluded the convicted individuals. Because the prosecution theories of the crimes required that the defendants be the source of the samples, the two convicts were exonerated and released. Realizing the potential of post-conviction DNA testing to expose miscarriages of justice, the American attorneys Peter Neufeld and Barry Scheck founded the Innocence Project at Cardozo Law School in 1992 as a legal clinic dedicated to such testing. Over the next two decades, the Innocence Project and other independent efforts exposed more than 300 wrongful convictions in the US through post-conviction DNA testing. This set of wrongful convictions has taken on a significance beyond the parties involved in the cases themselves. These high-profile exonerations have drawn attention to the issue of miscarriages of justice, to flaws in the American justice system, and to capital punishment. In part, their significance derives from their ability to be packaged and conceptualized as a "data set," and disseminated through reports, books, and the Innocence Project's website. In addition, however, their significance derives from their ability to achieve supposed "scientific certainty" or "epistemological closure" (Aronson and Cole 2009). Alleged miscarriages of justice exposed through post-conviction DNA testing were less vulnerable to the sort of definitional disputes over whether alleged miscarriages of justice should be characterized as miscarriages of justice at all that had dogged previous scholarly analyses of miscarriages of justice. While some post-conviction DNA exonerations may be challenged, even the most determined innocence skeptics concede that the vast majority of post-conviction exonerations constitute genuine miscarriages of justice.

Post-conviction DNA exoneration has largely been an American phenomenon; other countries have not reported a proportionate spate of post-conviction DNA exonerations. Exposure of miscarriages in general seems to occur most frequently in the US and more often in the common law countries than in continental Europe (Schiffer 2009). However, it is unclear whether this difference represents a less frequent *occurrence* of miscarriages of justice because of different procedural safeguards and legal cultures or a less frequent *exposure* of miscarriages of justice perhaps because of less favorable policies on the retention of evidence or post conviction review (Huff and Killias 2008).

Forensic Science as Cause of Miscarriages of Justice

Post-conviction DNA exonerations emerged as a principal, and privileged, source of data about miscarriages of justice. A series of analyses of the post-conviction DNA exonerations were performed which treated the development of forensic DNA profiling as a sort of natural experiment that offered a window into flaws in the justice system. Each subsequent analysis treated a larger number of exoneration cases and was increasingly detailed (Connors et al. 1996; Scheck et al. 2000; Saks and Koehler 2005; Garrett 2008, 2011; Garrett and Neufeld 2009). These analyses were primarily concerned with identifying the major causes of wrongful convictions and roughly weighing their relative contributions. Among the most prominent causes identified were eyewitness identification, false confessions, perjury, police and prosecutorial misconduct, and ineffective counsel. Analyses of the post-conviction DNA exonerations, however, also revealed a paradox. Forensic science was not merely the engine for exposing miscarriages of justice: analyses of post-conviction DNA exonerations revealed that forensic science itself was ranked among the most prominent contributors to miscarriages of justice (Saks and Koehler 2005). Seemingly paradoxically, forensic science was little discussed as a cause of miscarriages of justice until its role was exposed by . . . forensic science.

Some analyses of exonerations have attempted to construct rank-ordered lists of contributory factors. The position of forensic science on such lists has varied. Saks and Koehler (2005) rated forensic science second only to eyewitness identification as a cause of miscarriages of

justice, whereas Gross et al. (2005) hardly mentioned forensic science at all. A larger study by Gross and Shaffer (2012), however, lists forensic science fourth among the five leading causes of exposed wrongful convictions. Such measurements must be regarded as crude at best, and they have been challenged by defenders of forensic science (Collins and Jarvis 2009). Among the methodological problems that beset drawing inferences from post-conviction DNA exoneration data are: How should categories of causes be constructed? Should causes be coded for cases whenever present or only when contributing to the miscarriage of justice. If the latter, how would that be determined? How can we quantify the relative contribution of multiple causes to any individual miscarriage of justice when we do not know how much different items of evidence contributed toward the jury's verdict? Finally, as noted above, post-conviction DNA exonerations are a manifestly unrepresentative data set. They can tell us something about the causes of the subset of miscarriages of justice susceptible to exposure through post-conviction DNA testing, but can tell us much less about the entire universe of all miscarriages of justice. While it seems reasonable to use such analyses as rough indicators of where in a criminal justice system the principal causes of miscarriages of justice might lie, the common practice of characterizing each cause as a proportion of the total number of exonerations risks media reporting that may fuel popular misconceptions. For example, the research finding that 60 % of miscarriages of justice exposed by post-conviction DNA testing were caused in part by eyewitness identification may be misinterpreted to imply that misidentification by eyewitnesses is responsible for 60 % of *all* miscarriages of justice; or even – far worse – that 60 % of eyewitness identifications result in miscarriages of justice.

Bearing these caveats in mind, analysis of post-conviction DNA exonerations clearly shows that forensic science contributed to exposed miscarriages of justice in two primary ways. First, serological evidence which ought to have been interpreted as either excluding the defendant or as having nothing useful to contribute to the fact finder's perception of the defendant's guilt was instead presented to the fact finder as inculpatory. This occurred in 67 of the first 250 post-conviction DNA exoneration cases. Second, microscopic hair comparison evidence that ought, if used at all, to have been conveyed to the fact finder only as failing to exclude the defendant, or perhaps as including the defendant among a very large population that could have contributed the hair, was instead presented to the fact finder as highly incriminating. This occurred in 29 cases. In Canada, meanwhile, the 1998 Kaufman Commission report discussed the role of microscopic hair comparison in contributing to the wrongful conviction of Guy Paul Morin for murder, a miscarriage of justice that was only exposed through post-conviction DNA testing (Kaufman Commission 1998; Roach 2009). Among other things, the report emphasized overstatement of the probative value of scientific findings and failure to disclose possible sources of contamination.

To be sure, these were not the only ways in which forensic science contributed to miscarriages of justice exposed through post-conviction DNA testing. Bitemark evidence, fingerprint evidence, shoe print comparison, voice analysis, and even DNA profiling all contributed to some miscarriages of justice. However, the frequency of such cases was small compared to those involving serology or hair comparisons (Garrett 2011).

Some have suggested that post-conviction DNA exoneration data point only to the failings of specific forensic techniques (serology and hair comparison), rather than to a problem with the larger institution of "forensic science" (Collins and Jarvis 2009). However, transcript analysis reveals that the issue was not merely these techniques' lack of discriminating power, but also repeated exaggeration of the probative value of the evidence by forensic expert witnesses (Garrett 2011). This suggests a general tendency among forensic scientists to exaggerate the probative value of evidence and a general failure of courts to control it. But to what extent is it valid to extrapolate from documented problems with serology and hair comparison to "forensic science" in general?

While serology is relatively undiscriminating and hair comparison may be a forensic technique with limited accuracy, at least part of the explanation for the prevalence of serology and hair cases in the post-conviction DNA exoneration data has to do with the skewed nature of the data set (Gross 2008; Schiffer 2009). Only a small subset of all miscarriages of justice is eligible to be exposed through post-conviction DNA testing. These are typically cases deriving from a specific historical period, in which preconviction DNA profiling was not performed, but biological evidence was preserved; in which biological evidence is recovered; and in which charges are serious enough for convicts and attorneys to make strenuous efforts to obtain post-conviction DNA testing. These cases will be skewed toward sexual assaults and rape-murder cases and away from crimes with lesser penalties (Risinger 2007; Gross 2008; Natapoff 2012). Such cases are quite likely to have relied upon serology – and to a lesser extent hair comparison – at the time of the original conviction. We may thus expect post-conviction DNA testing to be better at exposing miscarriages of justice associated with serology or hair comparison than miscarriages of justice precipitated by, say, fingerprint identification. Even further at the extreme, consider, for example, arson and medical evidence of unexpected infant death which are now suspected of being major contributors to miscarriages of justice (Science and Technology Committee 2005; Findley 2011; Plummer and Syed 2012). Miscarriages of justice involving these forms of medical and scientific evidence are rarely, if ever, susceptible to post-conviction DNA testing. Indeed, in most cases they are not susceptible to dispositive exonerating evidence in any form, in part because the material issue is not the identity of the perpetrator but whether a crime was committed at all (the alternative hypothesis being that the death was accidental) (Naughton 2007; Findley 2011). Usually, the best the convict can hope for is a finding that the court relied upon scientific evidence that is now in doubt and that the conviction, therefore, should be quashed.

Some commentators argue that the post-conviction DNA exonerations offer a window into more systemic flaws within forensic science as an enterprise (Thompson 2008; Garrett 2011). These flaws include biased interpretation of evidence; poor regulation of forensic laboratories (Giannelli 2007); vague, nonstandardized, and misleading reporting of scientific conclusions; and failure to validate forensic techniques. Overlaid upon these problems is the courts' extremely permissive stance in admitting forensic science evidence at trial, despite these documented problems (National Research Council 2009; Garrett 2011).

The exposed cases run the gamut from alleged forensic vigilantism to what appears to have been "honest error" (Schiffer 2009). These are obviously quite different problems which invite different remedies. Vigilantism suggests a sort of generic personnel problem that could affect any industry, whereas "honest errors" seems to indicate flaws in forensic procedures themselves. Assigning exposed miscarriages of justice to specific causes, however, is problematic. Often, it is difficult to determine through post hoc analysis whether a forensic analysis that contributed to a miscarriage of justice derived from malicious intent or honestly held belief. While thorough and transparent documentation of the reasoning behind a forensic conclusion may permit answering this question, many forensic techniques historically have required only the kind of rudimentary documentation of conclusions that would be of little help in determining the cause of an error. In addition, once a miscarriage of justice has been exposed, the forensic analysts involved will usually have retained their own lawyers and have little incentive to speak candidly with auditors.

In sum, while post-conviction DNA exoneration data may be helpful in drawing attention to systemic problems in forensic science and the courts' treatment of it, the two key issues, concerning (1) the prevalence of forensic miscarriages of justice and (2) the relative magnitude of forensic science as a contributing factor, remain matters of speculation and – sometimes heated – debate.

Broader Policy Impact

Despite these methodological limitations, analyses of exposed miscarriages of justice have exerted considerable influence on US public policy, notably in relation to the death penalty. Abolitionists have cited miscarriages of justice exposed – often fortuitously – through post-conviction DNA testing as clear evidence that the risk of executing an innocent person in the American capital punishment system was too great. One federal court even adopted this view before it was overturned by a higher court (United States v. Quinones 2002). Post-conviction DNA exoneration provided an appealing rhetoric in which "science" was seen exposing the unreliability of American capital punishment. However, this rhetoric proved to be a double-edged sword in that some politicians adopted the view that convictions that rested upon forensic science might be viewed as "certain," and thus impervious to the risk of being labeled miscarriages of justice. Forensic science, then, might render capital punishment certain and safe (Aronson and Cole 2009). Such claims obviously belie the understanding of forensic science as a detection system that should be expected to produce a certain number of errors, as a statistical truism (see Fig. 1).

Another area in which these analyses have had an impact is on the movement to reform forensic science itself. Although it may be argued that there are plenty of good reasons to reform forensic science independent of miscarriages of justice – lack of validation of techniques; lack of accreditation, certification, and regulation; lack of basic research; lack of standards; vague reporting practices; insufficient funding; insufficient education and training; insufficient independence from law enforcement; insufficient ties with mainstream science, and so on – high-profile miscarriages of justice have been important in supplying tangible causes célèbres and a *raison d'être* to propel forensic science reform. If it cannot be shown that acknowledged problems in forensic science actually result in miscarriages of justice, policymakers may wonder why forensic reform is necessary when apparently just results continue to be achieved despite acknowledged weaknesses. Such claims are sensitive to what might be called the "base rate of guilt" – if the police present forensic analysts with an extremely high proportion of factually guilty suspects, even very poor forensic analyses may yield very high rates of factual accuracy. Nevertheless, it seems that it is difficult to generate public and political momentum to improve forensic science as an end in itself, so that miscarriages of justice are invariably invoked in official reports urging reform of the forensic sciences. In this essentially presentational and rhetorical sense, recent miscarriages of justice have played an important role in giving forensic science reform more traction than it has been able to secure in the past (e.g., Kaufman Commission 1998; Science and Technology Committee 2005; National Research Council 2009).

Other Sources of Data about Forensic Science and Miscarriages of Justice

In view of the well-known methodological limitations of relying on post-conviction DNA exonerations as a measure of miscarriages of justice, an alternative approach attempts to preempt objections regarding representativeness by studying all relevant cases in which particular forensic techniques have been utilized (Cooley 2004; Giannelli 2007). Yet this alternative research methodology still suffers from the principal problem afflicting all miscarriages of justice research: the fortuity of exposure of miscarriages of justice. It is clearly statistically inadequate to estimate the rate at which a particular technique produces miscarriages of justice simply by treating exposed errors attributable to that technique as the numerator and all cases in which it figured as the denominator of a fraction (Gross et al. 2005; Naughton 2007; Gross 2008).

Another approach is to try to use experimental psychology to model the processes and "human factors" which might cause forensic science to contribute to a miscarriage of justice. There have been several studies of contextual bias in forensic

science, developing the argument that biased scientific evaluations or expert opinions may be responsible for some miscarriages of justice (e.g., Schiffer 2009). Schiffer (2009) endeavored to study the relationship between forensic science and miscarriages of justice by interviewing forensic laboratory managers. Contradicting much received wisdom on what causes forensic science to go awry, Schiffer's interviewees suggested that the locus of error might be the crime scene as much as the crime laboratory. They also maintained that more coordination between forensic scientists and law enforcement might reduce forensic errors. This finding is in tension with the contextual bias literature, which tends to imply that forensic scientists should be shielded from "distorting" contextual information about the case provided by investigators and prosecutors.

Conclusion

The relationship between forensic science and miscarriages of justice has received greater attention over the last two decades, but that relationship remains complex. Forensic science, primarily in the form of post-conviction DNA profiling, has emerged as among the most powerful and persuasive exposers of miscarriages of justice. However, in the very process of exposing miscarriages of justice, post-conviction DNA profiling has implicated forensic science – including DNA profiling – as a contributor to acknowledged cases of wrongful conviction. Increasing awareness of miscarriages of justice has lent impetus to the growing clamor advocating reform of forensic science.

Generating empirical knowledge about the role of forensic science in miscarriages of justice poses methodological difficulties that render it difficult to draw firm conclusions. The evidence amassed thus far, however, does indicate that two particular forensic sciences, serology and microscopic hair comparison, played a major contributory role in generating that restricted and unrepresentative set of miscarriages of justice that were susceptible to exposure through post-conviction DNA testing. The extent to which it is safe to extrapolate that finding to those unexposed miscarriages of justice that may have occurred in other cases or to other forensic science disciplines remain matters of ongoing debate.

Related Entries

- Causes of Wrongful Convictions: An Overview
- Cognitive Forensics: Human Cognition, Contextual Information and Bias
- Cognitive Forensics: Human Cognition, Contextual Information and Bias
- Crime Science
- DNA Profiling and Identification
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- Strengthening Forensic Science
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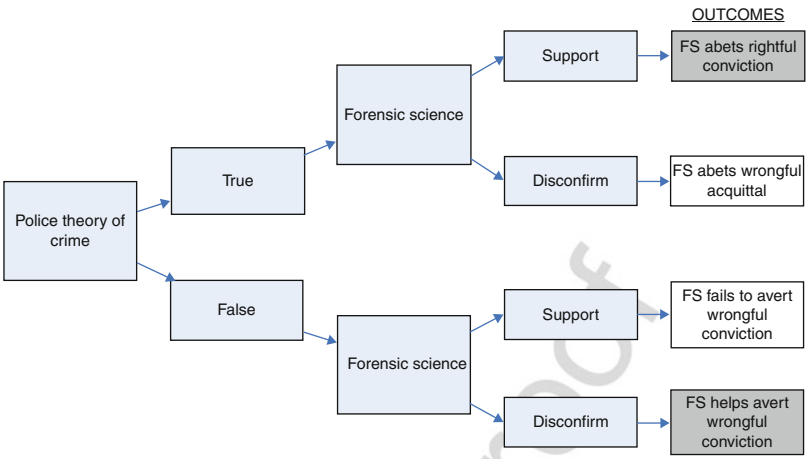

Forensic Science and Miscarriages of Justice, Fig. 1 Conceptual model of role of forensic science in miscarriages of justice. Negative outcomes are in *white boxes*; positive outcomes in *dark gray*