Perpetuating the Presumption of Guilt: The Role of Implicit Racial Bias in Forensic Testimony

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ABSTRACT

Over the last few years, conversations around racial bias in the criminal justice system have accelerated with most of the focus on police reform. However, one area that does not get nearly enough attention when it comes to implicit racial bias is forensic testimony. Lawyers, judges, and jurors often approach scientific sounding evidence with a predisposition to accept the expert's conclusions. Experts for the government are often presumed to be neutral and objective witnesses who report the science with no stake in the outcome. Yet, they are susceptible to bias, including implicit racial bias, just like everyone else. Implicit racial bias in forensic testimony cannot be ignored as a primary driver of injustice and wrongful convictions. This article discusses implicit racial bias, how it can impact forensic testimony, and what can be done about it.

I. Introduction

Since the murders of George Floyd and Breonna Taylor, conversations around racial bias in the criminal justice system have accelerated. Much of the focus has turned to police reform. The potential for racial bias, however, does not end with the initial stop, search, and arrest. Rather, it can be found throughout our criminal justice system, and forensic testimony is one area that does not get nearly enough attention when it comes to implicit racial bias.

Lawyers, judges, and jurors often approach scientific sounding evidence with a predisposition to accept the expert's conclusions without a critical eye. Experts for the government are often presumed to be neutral and objective witnesses who report the science with no stake in the outcome.

Government experts, however, are susceptible to bias—including

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implicit racial bias—just like the rest of us. These experts who testify in criminal cases may not be reporting "neutral science"; their testimony may be contaminated by implicit racial bias, among other biases, which may have colored their conclusions.

Pattern matching methods—such as analysis of firearms and toolmark impressions, bloodstains, latent prints, hairs, and footwear and tire impressions—are especially problematic.[1] These methods are inherently subjective, meaning that they rely heavily on the examiner's individual judgment, rather than any objective standard. For example, even though the examiner may be analyzing a bullet from a crime scene, that examiner may also be given "irrelevant contextual information," such as the name, race, and background of the lead suspect. Knowing that information can predispose the examiner to believe that the bullet was fired from that suspect's gun, leading to a result-driven opinion about whether the marks on the bullet "match" the marks on test fires from the gun. The human eye will see what it wants to see, and when there are no objective standards by which to measure the marks, the government expert's conclusions may reflect bias in favor of guilt. For many law enforcement-led forensic labs, that predisposition towards guilt exists as an independent background presumption, regardless of knowledge about the suspect's race. However, when the suspect's race is known, that information adds an extra level of bias. These two biases reinforce each other in difficult to identify ways because implicit racial bias is unspoken and remains rooted in decades of societal learning that has created presumptions about dangerousness, culpability, and propensity for violence based on race.

A number of recent exonerations have raised questions about the role of implicit racial bias in faulty forensic testimony that resulted in a wrongful conviction. For example, there are cases in which an examiner's opinion changed over time from inculpatory to exculpatory or neutral. The million-dollar question is what led the examiner to the inculpatory opinion in the first place, especially when that opinion ultimately proves to be changeable without any new information about the evidence itself.

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[1]Pattern matching methods, also called "feature comparison methods," are "methods that attempt to determine whether an evidentiary sample (*e.g.*, from a crime scene) is or is not associated with a potential 'source' sample (*e.g.*, from a suspect), based on the presence of similar patterns, impressions, or other features in the sample and the source." PRESIDENT'S COUNCIL OF ADVISORS ON SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, REPORT TO THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS 1 (2016) [hereinafter PCAST REP.], https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf [https://perma.cc/F6YC-4G6J] (discussing methods such as "the analysis of DNA, hair, latent fingerprints, firearms and spent ammunition, toolmarks and bitemarks, shoeprints and tire tracks, and handwriting").

The examiner's opinion on firearm and toolmark identification evidence in Patrick Pursley's case is a prime example.[2] Mr. Pursley, a Black man, was wrongfully convicted of murder in 1994 on the basis of the firearm examiner's opinion that test fires from a pistol attributed to Mr. Pursley matched bullets and cartridge cases retrieved from the crime scene.[3] The examiner asserted that he could identify the pistol as the murder weapon "to the exclusion of all others."[4] Mr. Pursley was convicted and sentenced to life without parole.[5]

Twenty-two years later, in 2016, the examiner testified at a post-conviction hearing that he had re-examined the evidence and, while he still believed that it was more than likely that Mr. Pursley's weapon fired the bullets, his examination was "inconclusive."[6]

For Mr. Pursley's part, he presented two new experts in post-conviction who affirmatively excluded the pistol as the murder weapon.[7] A post-conviction court vacated Mr. Pursley's conviction and ordered a new trial, and after a bench trial, the court found that the defense experts conclusively demonstrated that the cartridge cases were not fired from the weapon attributed to Mr. Pursley and no one identified the bullets as having been fired from that weapon.[8] On January 16, 2019, twenty-three years after being convicted of a crime he did not commit, Mr. Pursley was exonerated; two years later, he was awarded a certificate of innocence.[9]

Again, there was no new information about the bullets, cartridge cases, or the weapon itself, which begs the question of what led the examiner to his remarkably definitive conclusion at the original trial and whether Mr. Pursley's race played a role through implicit bias.

Other exoneration cases highlight the power of forensic testimony to secure a wrongful conviction by allowing jurors to justify presumptions about dangerousness under the guise of "science." The wrongful conviction of Zavion Johnson, a Black man, is a good example.[10] In 2002, Mr. Johnson was wrongfully convicted of the murder and

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[2]Maurice Possley, *Patrick Pursley*, NAT'L REGISTRY OF EXONERATIONS [hereinafter NROE, *Pursley*], https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5487 [https://perma.cc/J7TV-T79C] (last updated Oct. 12, 2021).

[3]NROE, *Pursley*, *supra* note 2.

[4]NROE, *Pursley*, *supra* note 2.

[5]NROE, *Pursley*, *supra* note 2.

[6]NROE, *Pursley*, *supra* note 2.

[7]NROE, *Pursley*, *supra* note 2.

[8]NROE, *Pursley*, *supra* note 2.

[9]NROE, *Pursley*, *supra* note 2.

[10]Maurice Possley, *Zavion Johnson*, NAT'L REGISTRY OF EXONERATIONS [hereinafter NROE, *Johnson*], https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5264 [https://perma.cc/Y6KQ-YVAA] (last updated Mar. 4, 2020).

assault of his four-month-old daughter, Nadia, after the prosecution's medical experts testified that Nadia had been violently shaken, resulting in her death.[11] Mr. Johnson insisted that Nadia had slipped from his grasp during a bath and hit her head on the bathtub.[12] "*Thirteen witnesses*—mostly family members—testified that [Mr.] Johnson was a loving, caring, calm, gentle, and patient father," but the jury believed the medical experts who insisted on a narrative of violent abuse.[13] The judge commented that the medical evidence "was overwhelming that this was not an accident," and Mr. Johnson was sentenced to twenty-five years to life in prison.[14]

Fifteen years later, in 2017, Mr. Johnson was exonerated after two of the prosecution's experts recanted their trial testimony, confirming that the injuries were not solely diagnostic of abuse and they could not exclude accidental injury.[15] Two other experts concluded that Nadia's injuries were consistent with a short fall as Mr. Johnson had described.[16] In late 2017—fifteen years after he lost his daughter and was wrongfully convicted for it—the government conceded Mr. Johnson's right to a new trial, did not oppose his release and, instead, dismissed all charges.[17]

These cases, and many others just like them in the National Registry of Exonerations, illustrate the subjectivity of forensic testimony, its susceptibility to implicit racial bias, and its power to reinforce implicit biases that may already exist in factfinders. The Registry also includes a number of cases in which forensic testimony was the main source of evidence upon which a person of color was wrongfully convicted, confirming the urgent need to address implicit racial bias in forensics. Implicit racial bias in forensic testimony cannot be ignored as a primary driver of injustice.

In this Article, we address how implicit racial bias can affect forensic testimony and ways to address it before wrongful convictions occur. In Part II, we explain what implicit bias is. In Parts III and IV, we discuss the presumption of guilt that exists in our criminal justice system for people of color especially Black and Brown people. Part V provides an overview of the relative lack of attention that implicit racial bias has received in forensic reform to date. In Part VI, we examine how widespread acceptance of forensic evidence as objective and impartial ignores how implicit racial biases in forensic

[11]NRoE, *Johnson*, *supra* note 10.

[12]NRoE, *Johnson*, *supra* note 10.

[13]NRoE, *Johnson*, *supra* note 10 (emphasis added).

[14]NRoE, *Johnson*, *supra* note 10.

[15]NRoE, *Johnson*, *supra* note 10.

[16]NRoE, *Johnson*, *supra* note 10.

[17]NRoE, *Johnson*, *supra* note 10.

testimony perpetuate the presumption of guilt for people of color in our criminal justice system. In Parts VII and VIII, we indicate the steps necessary to limit implicit racial bias and provide examples of what can be done to address it in forensic testimony such as auditing state forensic labs, creating independent (as opposed to law enforcement led) forensic labs, conducting root cause analyses in forensic labs, and cross-examining the government's forensic experts about how implicit racial bias may have infected their opinions. Finally, we conclude in Part IX that, in order to fully address the impact of implicit racial bias in the criminal justice system, we must acknowledge and address the role that forensic testimony plays in perpetuating the presumption of guilt for people of color.

II. THE RESEARCH BEHIND IMPLICIT RACIAL BIAS

Researchers have extensively documented the science of implicit racial bias (also known as unconscious bias), and courts have commented on the "growing body of social science [that] recognizes the pervasiveness of unconscious racial and ethnic stereotyping and group bias."[18] Implicit biases are "attitudes or stereotypes that affect our understanding, decision-making, and behavior, without our even realizing it."[19]

Implicit bias is to be contrasted with "explicit bias," which describes beliefs that are consciously endorsed such that the actor is aware of taking an action for a particular reason.[20] Historically, conventional wisdom dictated that human behavior was largely under conscious control.[21] Social scientists have since developed an extensive body of research that supports the opposite conclusion.[22] The science behind implicit bias confirms that "actors do not always have

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[18] *Chin v. Runnels*, 343 F. Supp. 2d 891, 906 (N.D. Cal. 2004), aff'd, 160 Fed. Appx. 633 (9th Cir. 2005) (citing Edward M. Chen, *The Judiciary, Diversity, and Justice for All*, 91 CAL. L. REV. 1109, 1119 n.51 (2003); Charles Lawrence, *The Id., The Ego, and Equal Protection: Reckoning with Unconscious Racism*, 39 STAN. L. REV. 317 (1987); Mari Matsuda, *Voices of America: Accent, Antidiscrimination Law, and a Jurisprudence for the Last Reconstruction*, 100 YALE L.J. 1329 (1991)); *see also Commonwealth v. Buckley*, 478 Mass. 861, 90 N.E.3d 767, 782 n.4 (2018) (Budd, J., concurring) ("Multiple studies confirm the existence of implicit bias, and that implicit bias predicts real-world behavior. That is, even people who do not believe themselves to harbor implicit bias may in fact act in ways that disfavor people of color." (citing Jerry Kang & Mahzarin Banaji, *Fair Measures: A Behavioral Realist Revision of "Affirmative Action,"* 94 CAL. L. REV. 1063, 1071–1073 (2006)).

[19] Jerry Kang et al., *Implicit Bias in the Courtroom*, 59 UCLA L. REV. 1124, 1126 (2012).

[20] Anthony G. Greenwald, *Implicit Bias: Scientific Foundations*, 94 CALIF. L. REV. 945, 946 (2006) ("Theories of implicit bias contrast with the 'naïve' psychological conception of social behavior, which views human actors as being guided solely by their explicit beliefs and their conscious intentions to act.").

[21] Kang et al., *supra* note 19, at 1129.

[22] Kang et al., *supra* note 19, at 1129.

conscious, intentional control over the processes of social perception, impression formation, and judgment that motivate their actions."[23]

Social scientists have studied implicit racial bias over several decades and through various measures and research paradigms.[24] The findings "fit well with other research on brain functioning and human judgment."[25] The data from these studies confirm that "implicit bias is pervasive (widely held), large in magnitude (as compared to standardized measures of explicit bias), dissociated from explicit biases (which suggests that explicit biases and implicit biases, while related, are separate mental constructs), and predicts certain kinds of real-world behavior."[26]

The predictive value of implicit bias is important.[27] Implicit bias is equally as destructive as explicit bias[28] and arguably more difficult to address because the research confirms that implicit biases may contradict our firmly held conscious beliefs.[29] The fact that implicit biases can still impact our behavior even when adverse to our

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[23]Greenwald, *supra* note 20, at 946.

[24]David L. Faigman, Nilanjana Dasgupta & Cecilia L. Ridgeway, *A Matter of Fit: The Law of Discrimination and the Science of Implicit Bias*, 59 HASTINGS L.J. 1389, 1430 (2008). Professor Faigman and his colleagues point out that "empirical evidence of implicit bias comes from studies using multiple methods and paradigms; it is not limited to the [Implicit Association Test]," although the IAT is well-known. Faigman et al., *supra*, at 1393 n.24.

[25]Faigman et al., *supra* note 24, at 1430.

[26]Kang et al., *supra* note 19, at 1130–31 (internal citations omitted).

[27]*See generally* Greenwald, *supra* note 20, at 954 ("Analyses of the data then determine whether individual differences in implicit attitudes or stereotypes measured by the IAT correlate with (i.e., are predictive of) individual differences in behavior . . . Importantly, implicit measures of bias have relatively greater predictive validity than explicit measures in situations that are socially sensitive, like racial interactions, where impression-management processes might inhibit people from expressing negative attitudes or unattractive stereotypes.").

[28]*See, e.g.*, *Hopkins v. Price Waterhouse*, 825 F.2d 458, 469, 44 Fair Empl. Prac. Cas. (BNA) 825, 43 Empl. Prac. Dec. (CCH) P 37230 (D.C. Cir. 1987), judgment rev'd on other grounds, 490 U.S. 228, 109 S. Ct. 1775, 104 L. Ed. 2d 268, 49 Fair Empl. Prac. Cas. (BNA) 954, 49 Empl. Prac. Dec. (CCH) P 38936 (1989) ("Unwitting or ingrained bias is no less injurious or worthy of eradication than blatant or calculated discrimination."); *see also* Gary Blasi, *Advocacy Against the Stereotype*, 49 UCLA L. REV. 1241, 1274 (2002) ("Racial minorities and others in stereotyped groups suffer silent consequences even when, and sometimes it appears especially when, group identity is unmentioned or unmentionable.").

[29]Greenwald, *supra* note 20, at 951 ("Implicit biases are especially intriguing, and also especially problematic, because they can produce behavior that diverges from a person's avowed or endorsed beliefs or principles."); Kang et al., *supra* note 19, at 1129 (Implicit biases "can function automatically, including in ways that the person would not endorse as appropriate if he or she did have conscious awareness.").

conscious or stated beliefs should make us pause and appreciate the real-world consequences of implicit biases in the criminal justice system. "[E]vidence that implicit attitudes produce discriminatory behavior is already substantial and will continue to accumulate."[30]

III. THE PRESUMPTION OF GUILT IN THE CRIMINAL JUSTICE SYSTEM

The existence of implicit bias is not reasonably subject to debate.[31] The impact on the criminal justice system is, likewise, beyond debate.[32] More than twenty-five years ago, in *Georgia v. McCollum*, Justice O'Connor wrote in dissent that "[i]t is by now clear that conscious and unconscious racism can affect the way white jurors perceive minority defendants and the facts presented at their trials, perhaps determining the verdict of guilt and innocence."[33] Even before that, Justice Brennan, in a dissent in *Turner v. Murray*, acknowledged that it is "incontestable that subconscious, as well as express, racial fears and hatreds operate to deny fairness to the person despised."[34] Decades later, in 2017, Justice Appel of the Iowa Supreme Court quoted Justices O'Connor and Brennan in a special concurrence recognizing that "we have a long way to go in

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[30] Greenwald, *supra* note 20, at 961 (citing the pre-publication version of Anthony G. Greenwald, T. Andrew Poehlman, Eric Luis Uhlmann & Mahzarin R. Banaji, *Understanding and Using the Implicit Association Test: III. Meta-Analysis of Predictive Validity*, 97 J. PERSONALITY & SOC. PSYCH. 17 (2009)).

[31] *See, e.g.*, Jerry Kang & Kristin Lane, *Seeing Through Colorblindness: Implicit Bias and the Law*, 58 UCLA L. REV. 465, 488 (2010) (discussing the notable summaries of predictive validity studies and the meta-analysis of 122 research reports by Greenwald "that included 184 independent samples and 14,900 subjects"); *see also* Kang & Lane, *supra*, at 504 (addressing critiques).

[32] *See, e.g.*, Jennifer Eberhardt, Phillip Atiba Goff, Valerie J. Purdie & Paul G. Davies, *Seeing Black: Race, Crime, and Visual Processing*, 87 J. PERSONALITY & SOC. PSYCH. 876 (2004); Kang et al., *supra* note 19, at 1134; *see also* Radley Balko, *There's Overwhelming Evidence that the Criminal Justice System Is Racist. Here's the Proof.*, WASH. POST (June 10, 2020), https://www.washingtonpost.com/graphics/2020/opinions/systemic-racism-police-evidence-criminal-justice-system/; SAMUEL R. GROSS, MAURICE POSSLEY & KLARA STEPHENS, NAT'L REGISTRY OF EXONERATIONS, RACE AND WRONGFUL CONVICTIONS IN THE UNITED STATES (2017), https://www.law.umich.edu/special/exoneration/Documents/Race_and_Wrongful_Convictions.pdf [https://perma.cc/FTA7-X9XH]; Bryan Stevenson, *A Presumption of Guilt, The Legacy of Lynching and How It Still Shapes American Criminal Justice*, N.Y. REV. (July 13, 2017), https://www.nybooks.com/articles/2017/07/13/presumption-of-guilt/ [https://perma.cc/U7TR-NRQ3].

[33] *Georgia v. McCollum*, 505 U.S. 42, 68, 112 S. Ct. 2348, 120 L. Ed. 2d 33 (1992) (O'Connor, J., dissenting) (citing *Developments in the Law—Race and the Criminal Process*, 101 HARV. L. REV. 1472, 1559–60 (1988); Douglas Colbert, *Challenging the Challenge: Thirteenth Amendment as a Prohibition Against the Racial Use of Peremptory Challenges*, 76 CORNELL L. REV. 1, 110–12 (1990)).

[34] *Turner v. Murray*, 476 U.S. 28, 42, 106 S. Ct. 1683, 90 L. Ed. 2d 27 (1986) (Brennan, J., dissenting).

ensuring fairness to racial minorities in our criminal justice system."[35] Justice Appel discussed the scientific and academic literature on implicit racial bias and urged the use of jury instructions to address implicit racial bias in criminal cases.[36]

Despite the research on implicit racial bias and the recognition that a disproportionate number of Black and Brown people are adversely impacted by the criminal justice system, studies "find evidence that race continues to influence individuals' decision-making and behavior" within the system.[37] Some efforts to recognize and mitigate the effects of implicit racial bias in the criminal justice system have faced blatant opposition. For example, a District Attorney in Tillamook County, Oregon, recently moved for, and won, an order preventing jurors in a criminal case from watching a juror orientation video on implicit bias—a video that is approved for use by the Oregon Judicial Department, features multiple state and federal court judges from Oregon explaining the concept of implicit bias, and is endorsed by the Chief Justice of the Oregon Supreme Court.[38] In the one paragraph motion, the District Attorney argued that jurors "are told they are implicitly biased despite their beliefs to the contrary or any evidence thereof and thereby injecting a doubt the State can't ever overcome."[39] The trial court granted the motion.[40]

This example from Tillamook County illustrates the common misconception that bias is a conscious, rather than subconscious, process and that individual belief can overcome it. Research tells us otherwise.

The unfounded and malevolent association of dark skin with criminality underlies many of the inequities that are pervasive in our justice system.[41] The system is built on the presumption of innocence, which has blinded us to the alternate reality—that there

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[35] *State v. Plain*, 898 N.W.2d 801, 830 (Iowa 2017) (holding modified by, State v. Lilly, 930 N.W.2d 293 (Iowa 2019)) (Appel, J., concurring).

[36] *Plain*, 898 N.W.2d at 830 (Appel, J., concurring).

[37] R. Richard Banks, Jennifer L. Eberhardt & Lee Ross, *Discrimination and Implicit Bias in a Racially Unequal Society*, 94 CALIF. L. REV. 1169, 1170 (2006).

[38] Motion to Preclude Implicit Bias Video in Juror Orientation and Reference to Implicit Bias in the Uniform Criminal Jury Instructions, State v. Garcia, No. 09-1071 (Tillamook Cnty. Or. Cir. Ct. May 11, 2021) [hereinafter *Garcia*, Prosecution Motion to Preclude] (on file with authors).

[39] *Garcia*, Prosecution Motion to Preclude, *supra* note 38, at 1.

[40] Order Granting Prosecution's Motion to Preclude Implicit Bias Video in Juror Orientation and Reference to Implicit Bias in the Uniform Criminal Jury Instructions, State v. Garcia, No. 09-1071 (Tillamook Cnty. Or. Cir. Ct. May 25, 2021) (on file with authors).

[41] A discussion of implicit bias requires an acknowledgment of the many complex stereotypes facing people of color, whether Black, Indian, Asian, Latino, Native American, or otherwise. Some of the stereotypes may overlap and some

exists an implicit presumption of guilt for some of those who come before it.[42]

The presumption of guilt facing Black and Brown people is well documented.[43] That presumption comes from decades of dehumanization through false narratives that portray Black and Brown people as dangerous, uneducated, and menacing.[44] This presumption of guilt implicitly shifts the burden to the individual to prove that he or she is not any of those things. But the presumption is not always intentional or perceptible, and that makes the burden to expose and rebut it a constantly moving target.

IV. WHERE DOES THE PRESUMPTION OF GUILT COME FROM?

Implicit bias related to race is built into our culture and our criminal justice system. Biases against people of color are long-standing and deep-seated, but, beginning in the 1980s, the U.S. government doubled-down with myths and stereotypes beyond the already discriminatory practices.[45] Racial profiling, mandatory minimums, stop-and-frisk, disparities in crack versus cocaine sentencing, and the ideas of the "super predator" and "crack babies" come easily to mind.[46] The system is still unraveling myth from reality, but these concepts are deeply woven into our culture in ways that impact even the day-to-day for people of color.

A. The Foundation for "Lawful Racism" in the Criminal Justice System

Historically, after the abolition of slavery, incarceration became a way to control newly freed Black people.[47] The presence of Black people in free society threatened White dominance and led to the policing and criminalization of Black and Brown bodies throughout

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may be specific to one race or ethnicity. By focusing on dark skin and criminality, the authors do not suggest that these other aspects of bias are less important, and the authors do not suggest that the stereotypes facing one race are universally applicable to all people of color.

[42] *See, e.g.*, Cynthia Kwei Yung Lee Jr., *Race and Self-Defense: Toward a Normative Conception of Reasonableness*, 81 MINN. L. REV. 367, 413 (1996) (recognizing "the oft-unstated assumption that blacks are still on probation—that unlike white men . . . blacks are not necessarily granted a presumption of innocence, competence, or even complete humanity.").

[43] *See, e.g.*, Balko, *supra* note 32; Stevenson, *supra* note 32, at 5.

[44] Stevenson, *supra* note 32, at 4.

[45] *See generally* MICHELLE ALEXANDER, THE NEW JIM CROW (2012) (explaining that media campaigns promoting the War on Drugs were designed to confirm discriminatory racial stereotypes in order to gain public and legislative support).

[46] *See, e.g.*, Shawn E. Fields, *Weaponized Racial Fear*, 93 TUL. L. REV. 931 (2019).

[47] Heather Ann Thompson, *The Racial History of Criminal Justice in America*, 16 DU BOIS REV. 221, 222–23 (2019).

the United States.[48] Terms like "brutes," "savages," and "deviants" began to proliferate American culture. These terms were coined to signify "innate and inherent" behavior that was said to be "embedded in the . . . DNA" of Black and Brown people such that they should be policed by White America.[49] These racialized beliefs amplified fear in White America, which eventually led to the creation of Jim Crow laws.[50] Racism laid the foundation for policies to criminalize communities of color in ways that persist in the law even today.

Some of those laws are neutral on their face, but they result in a disproportionate impact on communities of color. For some of those laws, that disproportionate impact was the intended result.

Drug laws enacted under the Reagan Administration are a powerful example. In 1982, President Reagan amplified the "War on Drugs" first created by President Nixon in 1971.[51] The Reagan administration enacted the Anti-Drug Abuse Act of 1986 ("ADAA"), which set the stage for a "zero tolerance" policy that aimed to reduce crime by increasing punishment.[52] The true impact was to further racialize drug policy.[53]

Under the ADAA, there was an increase in law enforcement size and funding, which led to the rise of over-policing of urban communities of color and subsequently a higher number of arrests in these communities.[54] Reagan specifically focused on possession of crack cocaine and marijuana by creating severe criminal consequences.[55] These two drugs were known to be possessed disproportionately by Black and Brown Americans. In contrast, powder cocaine, which was known to be disproportionately used by White Americans, was less harshly policed and punished.[56] The ADAA "legally equated drug use and distribution with violent crime"—an idea built on

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[48]Thompson, *supra* note 47, at 223.

[49]Thompson, *supra* note 47, at 222.

[50]Christopher J. Tyson, *At the Intersection of Race and History: The Unique Relationship between the Davis Intent Requirement*, 50 HOW. L.J. 345, 353 (2007).

[51]Dylan Tureff, *Securing White Votes by Incarcerating Black Bodies: The Criminalization of Blackness and the Perpetuation of a National Moral Panic in the American Carceral State*, 25 GEO. PUB. POL'Y REV. 42, 59 (2020).

[52]Pub. L. No. 99-570, 100 Stat. 3207 (1986) (codified as amended at 21 U.S.C. § 841); *see* Tureff, *supra* note 51, at 59–60.

[53]Tureff, *supra* note 51, at 59–60.

[54]Tureff, *supra* note 51, at 60.

[55]Tureff, *supra* note 51, at 60.

[56]Imani Perry, *Post-Intent Racism: A New Framework For An Old Problem*, 19 NAT'L BLACK L.J. 113, 129 (2006/2007).

unfounded assumptions, but which served to extend the length of any associated sentence.[57]

The association between race and criminality was by no means a new or novel approach by the time Reagan employed it in the 1980s.[58] Indeed, in the mid-1870s, Chinese immigrants were targeted through a link to opium because the Chinese were disliked by White Americans who believed them to be economic competitors.[59] The narrative around opium rapidly changed to one of racially-linked dangerousness as a way to exclude Chinese immigrants from the United States.[60] The anti-opium campaign was built on the belief that "Chinese opium dens would entrap virtuous white women who would then be available to have sex with Asian men."[61] As another example, in the 1920s, marijuana, which was known to be predominately associated with Hispanics, was characterized as encouraging violence, dangerousness, and criminality, forever linking those undesirable attributes to Hispanics, just as cocaine was used to link those same undesirable attributes to Blacks.[62] In the 1980s, the Reagan Administration was able to mass-produce the impact of these racial narratives through popular culture, as we subsequently discuss.

B. Creating a Culture of Implicit Racism

The ADAA moved the criminal justice system from a rehabilitation-based system to primarily punishment-based.[63] During the Reagan Administration, the ADAA was responsible for doubling the U.S. prison population, with "African Americans in that year" making "up nearly half of the U.S. prison population."[64]

The use of the media to connect race and criminality was an essential part of the Administration's strategy to justify efforts to target communities of color with incarceration through severe sentencing. The Reagan Administration exploited the media as a means to embed racial stereotypes in popular culture.[65] During his campaign, Reagan perpetuated the idea of the Black "welfare queen" to illicit

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[57]Tureff, *supra* note 51, at 47.

[58]Fields, *supra* note 46, *passim*.

[59]Kenneth B. Nunn, *Race, Crime and the Pool of Surplus Criminality: Or Why the "War on Drugs" was a "War on Blacks,"* 6 J. GENDER, RACE & JUST. 381, 413 (2002).

[60]Nunn, *supra* note 59, at 413–14.

[61]Nunn, *supra* note 59, at 414.

[62]Nunn, *supra* note 59, at 417.

[63]Perry, *supra* note 56, at 129.

[64]Perry, *supra* note 56, at 129.

[65]*See generally* Justin Levinson, *Forgotten Racial Equality: Implicit Bias, Decisionmaking, and Misremembering*, 57 DUKE L.J. 345, 363 (2007).

White voter support,[66] and, during his presidency, he employed all three major television networks to "broadcast seventy-four evening news segments about drugs, more than half of them about crack."[67] He relied on magazine articles to portray crack as "the biggest story since Vietnam and Watergate."[68] Suddenly, people throughout the United States were bombarded with media reports of rampant drug abuse and crime in communities of color.[69]

The press portrayed Black and Brown people as perpetrators, creating a lasting connection between race and criminality.[70] The racial stereotypes that flooded U.S. living rooms became a lawful means to accomplish racism by justifying harsh criminal penalties and influencing juror perceptions to encourage convictions.[71]

Those same stereotypes also marked a shift from explicit racism to implicit racism. Where explicit racism became "distasteful" after the Civil Rights Movement, implicit racism took over.[72] Much of the U.S. population grew to accept policies and decision-making that purported to focus on the supposedly poor morals and character of Black and Brown people, and not on their race.[73] The presumed connection between race and criminality is still prevalent today in media, social media, and, inevitably, in our criminal justice system because of how deeply embedded this connection is in our subconsciousness.

C. Data from the Criminal Justice System

Data confirms the impact of racial bias on the criminal justice system. "African Americans and Latinos comprise approximately 32% of the United States population, yet make up 56% of all

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> [I]t is quite intuitive that implicit biases reflect societal stereotypes. Research on stereotype formation and maintenance confirms that stereotypes are instilled at an early age and come from cultural and societal beliefs. According to Antony Page, psychologists have found that stereotypes arise when a person is as young as three years old and are usually learned from parents, peers, and the media. As people grow older, their stereotypes become implicit and remain mostly unchanged even as they develop nonprejudiced explicit views. Howard Ehrlich states, "Stereotypes about ethnic groups appear as a part of the social heritage of society . . . [And] no person can grow up in a society without having learned the stereotypes assigned to the major ethnic groups."

Levinson, *supra*, at 363 (internal citations omitted).

[66]Levinson, *supra* note 65, at 363.

[67]Tyson, *supra* note 50, at 375.

[68]Tyson, *supra* note 50, at 375.

[69]Tyson, *supra* note 50, at 375.

[70]Itay Ravid, *True Colors: Crime, Race and Colorblindness Revisited*, 28 CORNELL J.L. & PUB. POL'Y 243, 249 (2018).

[71]Ravid, *supra* note 70, at 250.

[72]Perry, *supra* note 56, at 116, 122.

[73]Tureff, *supra* note 51, at 56.

incarcerated people."[74] Around the year 2000, certain communities of color in Brooklyn, New York became known as "million dollar blocks for what it cost to incarcerate so many of [their] residents."[75]

Data from the wrongful conviction community reveals the same disturbing trend. Of the 2,810 exonerations to date, 64% were people of color.[76] The National Registry of Exonerations released a report in 2017 documenting the disproportionate number of exonerees from communities of color and specifically recognizing that innocent Black people were twelve times more likely to be convicted of drug crimes and seven times more likely to be convicted of murder than innocent White people.[77] The report also recognized disparities in access to relief, with Black exonerees spending a longer amount of time in prison before exoneration.[78]

Decisions from courts across the country recognize that implicit racial bias may contaminate criminal proceedings. Accordingly, courts have attempted to address implicit racial bias in jury selection (like in *Batson v. Kentucky*),[79] eyewitness testimony (like in *State v. Henderson*),[80] and juror deliberations (like in *State v. Plain*).[81]

Studies have repeatedly demonstrated that the color of a person's skin has subconscious effects on

> people's memory for who was holding a deadly razor in a subway scene . . ., people's evaluation of ambiguously aggressive behavior . . ., people's decision to categorize non-weapons as weapons . . ., the speed at which people decide to shoot someone holding a weapon . . ., and the probability that they will shoot at all . . .[82]

Psychologist Anthony Greenwald explains that implicit bias "shapes conscious thought, which in turn guides judgments and decisions."[83] For example, "[w]hen a [B]lack person does something that is open to alternative interpretations, like reaching into a pocket

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[74]Cedric Merlin Powell, *The Structural Dimensions of Race: Lock Ups, Systemic Chokeholds, and Binary*, 57 U. LOUISVILLE L. REV. 7, 8 (2018).

[75]Thompson, *supra* note 47, at 234.

[76]*Exonerations by Race/Ethnicity and Crime*, NAT'L REGISTRY OF EXONERATIONS, https://www.law.umich.edu/special/exoneration/Pages/ExonerationsRaceByCrime.aspx [https://perma.cc/6V8U-NWMP] (last visited Nov. 24, 2021).

[77]GROSS ET AL., *supra* note 32, at 3, 16.

[78]GROSS ET AL., *supra* note 32, at 7, 15.

[79]*Batson v. Kentucky*, 476 U.S. 79, 106 S. Ct. 1712, 90 L. Ed. 2d 69 (1986).

[80]*State v. Henderson*, 208 N.J. 208, 27 A.3d 872, 907 (2011).

[81]*State v. Plain*, 898 N.W.2d 801, 830 (Iowa 2017) (Appel, J., concurring).

[82]Eberhardt et al., *supra* note 32, at 876.

[83]Betsy Mason, *Curbing Implicit Bias: What Works and What Doesn't*, KNOWABLE MAG. (June 4, 2020), https://knowablemagazine.org/article/mind/2020/how-to-curb-implicit-bias [https://perma.cc/CBT3-SKQH].

or a car's glove compartment, many people—not just police officers—may think first that it's possibly dangerous. But that wouldn't happen in viewing a white person do exactly the same action."[84] Research confirms that the association of dark skin with criminality "appears to be automatic (i.e., not subject to intentional control),"[85] and those automatic associations get carried into the courtroom in criminal cases.

V. THE CURRENT LANDSCAPE ON IMPLICIT RACIAL BIAS AND FORENSIC TESTIMONY

In recent decades, the intersection between racial bias and the criminal justice system has become subject to increased scrutiny.[86] Racial profiling, over-policing in disenfranchised areas, and high arrest rates in communities of color have been at the forefront of these discussions, setting the groundwork to examine the real-world consequences of racial bias.[87]

There is also mounting scholarship on the pervasiveness of implicit racial bias at the post-arrest and trial level.[88] For instance, researchers have highlighted implicit racial bias as a factor in prosecutors' decisions about charging and plea offers.[89] Scholars have commented extensively about implicit racial bias in sentencing,[90] especially in the wake of mandatory minimum sentencing schemes.

The vast array of academic papers ultimately reveals the insidious nature of racial bias throughout the criminal justice system. In many of these areas, it is easy to recognize the human component and pinpoint the opportunity for bias to influence the outcome. In contrast, forensic science is one arena that has been portrayed as exacting, infallible, and even mechanical. This narrative has deceived many into believing that forensic evidence is impervious to outside influence. As a result, recognition of implicit racial bias in forensics has been gradual, leaving the current landscape on available commentary rather scarce.

Those that have explored the existence and subsequent effects of racial bias in forensic science have often addressed the issue

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[84]Mason, *supra* note 83.

[85]Mason, *supra* note 83 (citations omitted); *see also* Kang et al., *supra* note 19, at 1144.

[86]*See, e.g.*, Balko, *supra* note 32.

[87]Balko, *supra* note 32.

[88]*See, e.g.*, Joseph J. Avery & Joel Cooper, *Racial Bias in Post-Arrest and Pretrial Decision Making: The Problem and a Solution*, 29 CORNELL J.L. & PUB. POL'Y 257 (2019).

[89]Kang et al., *supra* note 19, at 1139.

[90]Jeffrey Rachlinski & Sheri Lynn Johnson, *Does Unconscious Racial Bias Affect Trial Judges?*, 84 NOTRE DAME L. REV. 1195 (2009).

narrowly. Some academic sources have approached the issue by focusing on one type of methodology, most frequently those that involve classification of human features, such as DNA phenotyping and newer algorithms on facial recognition.[91] Meanwhile, other commonly-used forms of forensic evidence have been able to maintain a façade of unbiased objectivity.[92]

A number of researchers have made important contributions to the field of bias in forensics by focusing more generally on cognitive bias, the umbrella under which implicit bias is nested.[93] Much of the research explores types of cognitive bias, like contextual bias, confirmation bias, or expectation bias.

While implicit racial bias is attracting significant attention in most other major segments of the criminal justice system, there remains a considerable disconnect in the literature on bias in forensic science. Indeed, even the National Academy of Sciences report in 2009—the seminal report on problems in forensics—discussed sources of bias in forensics, but failed to mention implicit racial bias as a prominent factor.[94]

It is not enough to mitigate the risk of implicit racial bias in the policing and jury phases of the process. It is also not enough to talk about bias generally in forensics without recognizing a source of bias within each analyst individually. Without the serious recognition of the impact of implicit racial bias on forensic testimony, the criminal justice system will continue to see wrongful convictions, false narratives about criminality, and the over-incarceration of communities of color.

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[91] *See, e.g.*, Gabrielle M. Haddad, *Confronting the Biased Algorithm: The Danger of Admitting Facial Recognition Technology Results in the Courtroom*, 23 VAND. J. ENT. & TECH. L. 891, 906 (2021); Filipa Queirós, *The Visibilities and Invisibilities of Race Entangled with Forensic DNA Phenotyping Technology*, 68 J. FORENSIC & LEGAL MED. 101858 (2019).

[92] *See* Alison J. Lynch & Michael L. Perlin, "*I See What Is Right and Approve, but I Do What Is Wrong": Psychopathy and Punishment in the Context of Racial Bias in the Age of Neuroimaging*, 25 LEWIS & CLARK L. REV. 453 (2021).

[93] *See, e.g.*, Glinda Cooper & Vanessa Meterko, *Cognitive Bias Research in Forensic Science: A Systematic Review*, 297 FORENSIC SCI. INT'L 35 (2019); Gregory S. Cusimano, *Implicit Unconscious Bias*, 79 ALA. LAW. 418 (2018); Itiel Dror, *Cognitive and Human Factors in Expert Decision Making: Six Fallacies and the Eight Sources of Bias*, 92 ANAL. CHEM. 7998 (2020); Jennifer Mnookin et al., *The Need for a Research Culture in Forensic Sciences*, 58 UCLA L. REV. 725 (2011).

[94] *See* HARRY T. EDWARDS, COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCI. CMTY. & THE RES. COUNCIL OF THE NAT'L ACADS., STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009) [hereinafter NAS REP.], https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf [https://perma.cc/9FJZ-LWLE].

VI. THE ROLE OF FORENSIC EVIDENCE IN PERPETUATING THE PRESUMPTION OF GUILT

The stereotypes and unconscious assumptions that lead to implicit racial bias in all of us also exist in forensic examiners. Understanding implicit racial bias in forensic testimony is crucial. We all know that "CSI," and television shows like it, might create false expectations about forensic evidence.[95] That fallacy may extend further than we understand. Most jurors can appreciate that it is at least possible for a police officer to act in a manner that may be fueled by racial bias. But most jurors do not understand that scientific-sounding opinions may not be scientific at all and may, instead, reflect implicit racial bias. Research has repeatedly recognized that juries will place great weight on scientific-sounding evidence, disregarding all other evidence to the contrary.[96] By the time we get to the start of jury deliberations on the fate of a person of color in a case involving subjective forensic evidence, we may have multiple layers of bias at play *and* the stamp of "scientific approval" from a forensic lab. The odds are insurmountable at that point.

The illusion of "science" has long-been used to justify the intentional subjugation of people of color.[97] The same intentionality may not always be present in forensic testimony, but the criminal justice system is relying no less on pseudo-science to justify the same result. Even though we may intend otherwise, implicit racial bias works its way into the system through forensic opinions.

Historically, those opinions had often been expressed as definitive (in absolute terms) with low, or even zero, error rates, leading many to believe that forensic methods were infallible. Over the past ten-to-fifteen years, however, there has been a growing skepticism about the presumed efficacy of some forensic sciences, including pattern

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[95] *See, e.g.*, Ian Hawkins & Kyle Scherr, *Engaging the CSI Effect: The Influences of Experience-Taking, Type of Evidence, and Viewing Frequency on Juror Decision-Making*, 49 J. CRIM. JUST. (2017); Michael Johnson, Note, *The "CSI Effect": TV Crime Dramas' Impact on Justice*, 15 CARDOZO PUB. L. POL'Y & ETHICS J. 385 (2017).

[96] *See* Brandon L. Garrett, Nicholas Scurich & William E. Crozier, *Mock Juror's Evaluation of Firearm Examiner Testimony*, 44 LAW & HUM. BEHAV. 412, 414 (2020) (collecting studies in different forensic methods).

[97] *See, e.g.*, Tim Crowe, *How Science Has Been Abused through the Ages to Promote Racism*, CONVERSATION (Nov. 19, 2015), https://theconversation.com/how-science-has-been-abused-through-the-ages-to-promote-racism-50629 [https://perma.cc/68PA-6WE5]; Thomas Klikauer & Norman Simms, *The Science of Race and the Racism of Science*, COUNTERPUNCH (Oct. 23, 2020), https://www.counterpunch.org/2020/10/23/the-science-of-race-and-the-racism-of-science/ [https://perma.cc/M8WG-G9KE].

matching methods.[98] Leading scientists around the country have started to weigh in and expose the weaknesses in certain forensic methods, including a lack of scientific validation,[99] the absence of objective standards,[100] and data from validation studies that has been manipulated to drive error rates down and give the false impression that the methods are near perfect.[101]

Faulty or misleading forensic evidence has contributed to nearly half of the known DNA exonerations and at least one-quarter of all exonerations to date.[102] Insights into the fallibility of forensic methods are rapidly evolving. In the meantime, the deeply held belief that forensic evidence is objective and impartial has led many of us down the primrose path to believing that the addition of forensic evidence to a case will cure any bias that may have contaminated the initial suspicion and arrest.

As mentioned above, however, bias in forensics is well-documented.[103] For example, the President's Council of Advisors on Science and Technology (PCAST) Report from 2016 recognized that errors in pattern-matching methods arise, in part, because "in certain settings, humans (1) may tend naturally to focus on similarities between samples and discount differences and (2) may also be influenced by extraneous information and external pressures about a case."[104] As another example, leading researchers recently released a study on cognitive bias in forensic pathology, a community that had (like many forensic practitioners) long denied that

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[98] *See generally* NAS REP., *supra* note 94 (reporting findings and recommendations related to certain pattern matching methods after a Congressionally-mandated study); PCAST REP., *supra* note 1 (reporting findings and recommendations related to certain pattern matching methods after a literature search and review); *see also* Aliza B. Kaplan & Janis C. Puracal, *It's Not a Match: Why the Law Can't Let Go of Junk Science*, 81 ALB. L. REV. 895 (2018) (discussing the disconnect between the state of the science and the state of the law).

[99] *See* NAS REP., *supra* note 94, at 8; PCAST REP., *supra* note 1, at 22.

[100] NAS REP., *supra* note 94, at 80; PCAST REP., *supra* note 1, at 125.

[101] Itiel E. Dror & Nicholas Scurich, *(Mis)use of Scientific Measurements in Forensic Science*, 2 FORENSIC SCI. INT'L: SYNERGY 333 (2020); *cf.* Garrett et al., *supra* note 6, at 414 ("As a general matter, the laity views forensic science as highly accurate and persuasive, and is generally insensitive to variations in the way in which a 'match' is communicated in non-numeric terms.").

[102] NAT'L REGISTRY OF EXONERATIONS, https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx (last visited Nov. 24, 2021) (searchable database of DNA exoneration cases, filterable by a number of contributing factors, including faulty/misleading forensic evidence).

[103] *See, e.g.*, D. Michael Risinger, Michael J. Saks, William C. Thompson & Robert Rosenthal, *The* Daubert/Kumho *Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 CAL. L. REV. 1 (2002); *see also* NAS REP., *supra* note 94, at 184; PCAST REP., *supra* note 1, at 31.

[104] PCAST REP., *supra* note 1, at 49.

bias could impact their decision making.[105] The authors found that forensic pathologists who took part in the study "*were noticeably affected by medically irrelevant contextual information* (information that should not have any bearing on the decision)."[106]

There are at least two key concerns about the impact of implicit racial bias on forensic testimony. First, when the forensic testimony is faulty (whether overstated or just plain wrong), reliance on it opens the door to convictions based solely on racial bias. If the initial suspicion was fueled by the color of the suspect's skin (whether intentionally or unintentionally), the misleading forensic evidence does nothing to confirm the suspicion, but it does have the power to cloak the prosecutor's case in "science" by giving it the appearance of objectivity. If we strip away the misleading forensic evidence, we will certainly find cases where an individual is facing years in prison for no other reason than because he or she looks like what society, or an individual police officer, thinks a dangerous criminal would look like.

Second, analyst discretion in the process itself opens the door to bias, which affects the outcomes of forensic testing. As discussed in the introduction to this Article, many commonly used forensic methods are subjective, meaning they depend largely on human judgment. The more human judgment involved, the more subjective a method becomes. And with human judgment comes the risk of bias and error. Think of it on a spectrum. At one end of the spectrum are purely objective methods, like weighing an object on a digital scale. At the other end of the spectrum are purely subjective methods, like weighing an object in one's hand. As we move toward the subjective end of the spectrum, we see more human judgment involved, which increases the risk that the examiner's opinion will be tainted by bias and error.

Knowing the race of the suspect at the outset can trigger bias that skews the analyst's conclusions toward guilt, even unintentionally. Take, for example, the 1997 case involving Richard Jackson who was sentenced to life in prison without parole for the murder of his romantic partner, Alvin Davis.[107] Mr. Jackson, a Black man, was wrongfully convicted after the police focused on him to the exclusion of a White suspect. A latent print examiner from the police department opined that two bloody fingerprints near the body belonged to Mr. Jackson. That opinion formed the sole basis for probable

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[105]Itiel Dror et al., *Cognitive Bias in Forensic Pathology Decision*, 66 J. Forensic Sci. 1751 (2021).

[106]Dror et al., *supra* note 105, at 1754 (emphasis in original).

[107]Maurice Possley, *Richard Jackson*, Nat'l Registry of Exonerations [hereinafter NRoE, *Jackson*], https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=3318 (last updated Mar. 18, 2019).

cause,[108] and, without it, there was no more evidence against Mr. Jackson than there was against the White suspect. The latent print "match" ultimately secured Mr. Jackson's conviction.

After the conviction, the International Association of Identification (IAI) moved to decertify the latent print examiner for his opinion in Mr. Jackson's case.[109] Based on the IAI's findings and new testing conducted by the FBI, Mr. Jackson was granted a new trial and was fully exonerated of the crime in 2000.[110]

Cases like Mr. Jackson's raise the natural question of whether implicit racial bias led the forensic examiner to a false conclusion. When forensic evidence is placed in the hands of an individual examiner, it is viewed through that examiner's internal lens and is susceptible to judgment based on how one's brain processes experience and information.[111] In a practice that is already open to subjectivity, there will inevitably be decisions made that reflect inherent prejudices about people of color. The debate about the causes of false conclusions like the one made in Mr. Jackson's case continues and may never be resolved in a way that feels satisfactory to those who understand that implicit racial bias hides in the subconsciousness.

VII. MAKING A CHANGE

Race is "psychologically salient."[112] By virtue of how implicit bias works, " 'race cards' are always present and having an effect, even when they are face down or still in the deck."[113] The impact of race is ubiquitous. Still, change is slow to come. In some areas, change is lagging because the path forward is not clear.[114]

In other areas, change is lagging because, although we can see the problem in theory, we cannot see the problem in our own space. We tend to believe that the problem exists for some "other" person—not in our city, not in our lab, not in our case. Social scientists have written about the "bias blindspot" that leads us to believe "that others

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[108] *Jackson v. Paparo*, 2002 WL 32341800 (E.D. Pa. 2002).

[109] NRoE, *Jackson*, *supra* note 107.

[110] NRoE, *Jackson*, *supra* note 107.

[111] Cusimano, *supra* note 93, at 425.

[112] Banks et al., *supra* note 37, at 1170.

[113] *See also* Blasi, *supra* note 28, at 1274.

[114] *See, e.g.*, *Commonwealth v. Buckley*, 478 Mass. 861, 90 N.E.3d 767, 782 (2018) (Budd, J., concurring) (recognizing "how pretextual stops disproportionately affect people of color" and recognizing that "the solution . . . is not clear"); *State v. Plain*, 898 N.W.2d 801, 832 (Iowa 2017) (Appel, J., concurring) (discussing differing views on the utility of a jury instruction on implicit bias).

are biased but we ourselves are not."[115] But implicit biases are pervasive, meaning that "everyone possesses them, even people with avowed commitments to impartiality such as judges."[116] The same, of course, is true for police, prosecutors, forensic examiners, defense attorneys, and jurors. It affects each of us and is beyond our conscious understanding and control.[117] Scientists have explored the factors that make self-reports of neutrality unreliable, including false assumptions about our ability to accurately access and understand our own motivations, cognitions, and behaviors, and our willingness to report them honestly in the face of clear social norms.[118]

Nonetheless, decision makers want evidence to prove that racial bias is happening *here* before they are willing to act.[119] They want data to show that, in a given case or a given lab, analysts made the decision to turn left when they should have turned right, and that decision was based on race.

The demand for data is not new or unique to forensic reform. People of color are frequently put to the "prove it" test. But the demand for data misses the point.

We know that implicit bias is real.[120] We know that the presumption of guilt is real.[121] We know that people of color are disproportionately affected by the criminal justice system.[122] The demand for proof of impact in each individual case or each individual lab ignores the reality that implicit bias is *implicit*—meaning silent, tacit, inherent,

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[115] Kang et al., *supra* note 19, at 1173–74 (citing Emily Pronin, *Perception and Misperception of Bias in Human Judgment*, 11 TRENDS COGNITIVE SCI. 37 (2007)).

[116] *State of the Science: Implicit Bias Review 2017*, KIRWAN INST. (Nov. 5, 2017), https://kirwaninstitute.osu.edu/article/2017-state-science-implicit-bias-review [https://perma.cc/XE34-ASDJ]; *cf.* Kang et al., *supra* note 19, at 1141–42 ("[T]here is no reason to presume attorney exceptionalism in terms of implicit biases. And if defense attorneys, who might be expected to be less biased than the population, show typical amounts of implicit bias, it would seem odd to presume that prosecutors would somehow be immune."); Kang et al., *supra* note 19, at 1144 ("[G]iven that implicit biases generally influence decisionmaking, there is no reason to presume that citizens become immune to the effects of these biases when they serve in the role of jurors.").

[117] *See* Kang et al., *supra* note 19, at 1173–74.

[118] *See* Faigman et al., *supra* note 24, at 1404–07; *see also* Kang & Lane, *supra* note 31, at 470.

[119] *Cf.* Banks et al., *supra* note 37, at 1170 ("The ostensible consensus [opposition to bias and discrimination] fractures as one moves from broad statements of principle to specific circumstances. The consensus splinters not so much because of support for bias and discrimination, but rather because there are multiple ways to conceptualize bias and to enact the antidiscrimination principle in the criminal justice context.").

[120] *See supra* note 19 and accompanying text.

[121] *See supra* note 32 and accompanying text.

[122] *See supra* note 32 and accompanying text.

unsaid. It is unreasonable to demand explicit evidence of something that we already understand to be implicit.

The demand for data further ignores the systemic aspects of racism, which is a different category of concern altogether.[123] Systemic racism results from policies that are race-neutral on their face, but produce disparate outcomes. In the forensic context, for example, crime lab policies that allow discretion in the analysis may be race-neutral on their face, and yet they produce disparate outcomes because discretion allows implicit (or explicit) bias to contaminate the results of the examination.

This reality does not necessarily mean that we must, after the fact, presume that bias occurred in every case.[124] But it does mean that we should proactively protect against bias in every case.[125]

VIII. PROGRESS IS POSSIBLE, BUT REQUIRES MORE THAN WHAT WE ARE DOING NOW

Addressing implicit bias in the criminal justice system requires real work. It would be naïve to think that we can address deeply rooted conscious and unconscious bias with band-aid approaches, like a yearly "anti-bias" training, without more.[126] That type of a "fix" has not been tested to determine efficacy and may give the appearance of productivity without any assurance of effectiveness.[127]

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[123]For an excellent discussion of systemic racism, see Matthew Clair, Phillip Atiba Goff, Rahsaan Hall & Asli Bashir, Quattrone Ctr., *The Administration of Blind Justice: Criminal Justice Institutions and Racial Bias*, YOUTUBE (Nov. 12, 2020), https://youtu.be/oM4i-VI7Owc.

[124]*See generally* Kang & Lane, *supra* note 31, at 492 (discussing strategies to deal with the problem of bias *ex ante* versus *ex post*).

[125]Kang & Lane, *supra* note 31, at 499 (discussing prevention). Professors Kang and Lane discuss action using the general approach of "behavioral realism," which seeks to use new understandings in the mind and behavioral sciences to advance the law based on more accurate models of human cognition and behavior. For a description of "behavioral realism," see Kang & Lane, *supra* note 31, at 490.

[126]Mason, *supra* note 83, summarized in an interview with leading psychologist Anthony Greenwald, who is quoted as saying:

> I'm at the moment very skeptical about most of what's offered under the label of implicit bias training, because the methods being used have not been tested scientifically to indicate that they are effective. And they're using it without trying to assess whether the training they do is achieving the desired results. I see most implicit bias training as window dressing that looks good both internally to an organization and externally, as if you're concerned and trying to do something. But it can be deployed without actually achieving anything, which makes it in fact counterproductive.

[127]Mason, *supra* note 83.

The good news is that implicit beliefs and attitudes are malleable,[128] and research confirms that it is possible to prevent bias from affecting some aspects of decision making. The jury is still out on the best way to effect change, but there are steps that can, and should, be taken.

Some researchers advocate for effortful relearning: "[B]eing aware of potential biases, being motivated to check those biases, and being accountable to a superior (as a jury feels toward a judge) should have some effect on the translation of bias to behavior."[129] Other researchers urge more proactive solutions that can and should be used by forensic practitioners, such as adopting policies to minimize irrelevant contextual information through the use of case managers or procedures like "Linear Sequential Unmasking."[130]

These "blinding" procedures help eliminate discretion where possible, which leading psychology Professor Anthony Greenwald says has proven effective in the past:

> The classic example of this is when major symphony orchestras in the United States started using blind auditions in the 1970s. This was originally done because musicians thought that the auditions were biased in favor of graduates of certain schools like the Juilliard School. They weren't concerned about gender discrimination.
>
> But as soon as auditions started to be made behind screens so the performer could not be seen, the share of women hired as instrumentalists in major symphony orchestras rose from around 10 percent or 20 percent before 1970 to about 40 percent. This has had a major impact on the rate at which women have become instrumentalists in major symphony orchestras.[131]

Discretion elimination is possible in many areas of forensic analysis, and Professor Greenwald's example suggests that, even if eliminating racial bias is not the motivating force, reducing discretion produces favorable results.

To be clear, the research does not promise that we can rid ourselves of implicit bias altogether. But we can take steps to prevent some biases from translating into behavior.

Forensic labs, especially labs run by law enforcement, have little incentive to change because courts regularly admit forensic

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[128]Nilanjana Dasgupta & Anthony G. Greenwald, *On the Malleability of Automatic Attitudes: Combating Automatic Prejudice with Images of Admired and Disliked Individuals*, 81 J. PERSONALITY & SOC. PSYCH. 800, 801 (2001).

[129]Kang & Lane, *supra* note 31, at 500.

[130]Dror et al., *supra* note 105, at 1756.

[131]Mason, *supra* note 83.

testimony without limitation.[132] Addressing implicit racial bias in forensic testimony will require a culture shift as well as structural changes to forensic labs. These changes will require advocacy from defense attorneys and other criminal justice stakeholders. Below are actions that can directly reduce implicit racial bias in forensic testimony:

A. Auditing Forensic Lab Policies to Minimize Contextual Information and Reduce Discretion

Many forensic labs do not have policies to prevent analysts from exposure to irrelevant contextual information, such as the race and background of the suspect. The methods are, further, highly subjective and allow the individual examiner to exercise considerable discretion. These two factors together open the door to implicit racial bias.

For example, in firearms and toolmark analysis, the examiner may be given police reports with the name and race of the lead suspect, along with the officer's narrative of the investigation to date. The examiner is likely to review those police reports before examining the bullet or casing found at the crime scene and knows that the officer is attempting to identify the suspect's firearm as the source of the bullet or casing from the scene. Adding to that irrelevant contextual information is the lack of any objective standards in the firearms and toolmark methodology itself. The examiner has complete discretion to declare a match and testify that a bullet or casing at a crime scene came from the defendant's firearm. There is no universal standard that tells the examiner the number of similar marks they need to find between the spent ammunition and the test fire before the examiner can declare a "match" and opine that the suspect's firearm was the source of the spent ammunition.[133] There is no universal standard that tells an examiner that a particular mark is unique and discriminating. Indeed, there is nothing objective that

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[132] *See U.S. v. Tibbs*, 2019 WL 4359486, at *5 (D.C. Super. Ct. 2019) ("Without disparaging the work of other courts, the [National Research Council's] critique of our profession rings true, at least to the undersigned: many of the published post-*Daubert* opinions on firearms and toolmark identification involved no hearing on the admissibility of the evidence or only a cursory analysis of the relevant issues . . . [T]he case law in this area follows a pattern in which holdings supported by limited analysis are nonetheless subsequently deferred to by one court after another. This pattern creates the appearance of an avalanche of authority; on closer examination, however, these precedents ultimately stand on a fairly flimsy foundation . . . [T]rial courts defer to expert witnesses; appellate courts then defer to the trial courts; and subsequent courts then defer to the earlier decisions." (internal citations omitted)).

[133] Firearms examiners usually testify that two items "match" when the degree of similarity between the spent ammunition and the test fire exceeds the degree of similarity with respect to the "best known non-match." The "best known non-match," however, is based entirely on what that examiner recalls from his or her individual experience.

prevents an examiner from lowering the threshold to declare a "match" in any particular case.[134] Giving examiners that level of discretion creates opportunities for implicit bias to infect the results—bias of which the examiner may be unaware and the defendant may never be able to "prove" in a manner that could overcome the strength of the examiner's opinion of a "match."[135]

There are several organizations that are attempting to create objective standards in different forensic methods, which will reduce discretion in the analysis.[136] Unfortunately, none of those standards are binding on any individual lab or examiner.

To address implicit bias in forensics, labs can and should audit their own policies to reduce bias. Labs can adopt policies that minimize contextual information through case managers or procedures like "Linear Sequential Unmasking" (a process that controls the sequence and timing of information to ensure that the examiner makes key analytical judgments, and documents them, before being exposed to relevant, but potentially biasing, information).[137] Labs can further revise policies to reduce discretion in the analysis, thereby reducing opportunities for bias. According to Professor Greenwald, when decisions "are made based on predetermined, objective criteria that are rigorously applied, they are much less likely to produce disparities."[138]

For those labs that are unwilling to audit policies and reduce bias, legislators have the authority to act. In Oregon, for example, the Secretary of State has authority to audit state agencies, including state-run labs.[139] To address the needs of forensic labs and the ever-changing nature of science more effectively and efficiently, legislators in all states can establish independent commissions to provide

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[134] As Risinger and colleagues said:

> One well-established effect of expectation, however induced or derived, in the perception tuning process is that decision thresholds shift as a function of expectations. Thus, in response to identical stimuli, a positive decision becomes more likely, and therefore more likely to be a false positive, or less likely, and therefore more likely to be a false negative, purely as a consequence of decision thresholds that change as expectation changes.

Risinger et al., *supra* note 103, at 16.

[135] *Cf.* NAS REP., *supra* note 94, at 185 ("The traps created by such [contextual] biases can be very subtle, and typically one is not aware that his or her judgment is being affected.").

[136] *See, e.g.*, CTR. FOR STATISTICS & APPLICATIONS IN FORENSIC EVID., https://forensicstats.org/; NAT'L INST. STANDARDS & TECH., ORG. OF SCI. AREA COMMS. FOR FORENSIC SCI., https://www.nist.gov/organization-scientific-area-committees-forensic-science.

[137] *See, e.g.*, Dror et al., *supra* note 93, at 8003; Cooper & Meterko, *supra* note 93, at 43.

[138] Mason, *supra* note 83.

[139] *See, e.g.*, OR. REV. STAT. § 297.070 (describing auditing authority of the Oregon Secretary of State).

ongoing oversight for labs, including the authority to conduct audits and mandate the use of objective standards.[140]

B. Making the Shift to Independent Labs

In 2009, the National Academy of Sciences issued its groundbreaking report that included a recommendation that public forensic labs be removed from law enforcement control.[141] The reason for the recommendation was to maximize independence in forensic analysis and reduce other forms of bias in the analysis, including confirmation bias and contextual bias.

Shifting to an independent lab model will also help to reduce the risk that implicit racial bias in the policing phase will bleed into the forensic analysis. Forensic examiners who are on the same "team" as the arresting and investigating officers may be pressured (overtly or more subtly) to confirm initial suspicions.[142] When those initial suspicions are based on racial bias, the forensic opinions may be unfairly skewed toward guilt as false inferences and assumptions are fed into the analysis. Indeed, "expectation bias" is a well-known phenomenon that reflects the tendency for experimenters to accept data that agrees with their expectations for the outcome of an experiment, and to disregard or minimize data that appears to conflict with those expectations.[143]

Independence can also help to shift forensic labs toward a "research culture" that prioritizes research-based knowledge, scientific questioning, and consistent efforts to improve methods.[144] That culture is severely lacking in forensic science.[145] A research culture encourages a diversity of perspectives from forensic and non-forensic scientists—including statisticians, psychologists, and those with advanced training in hard sciences like biology, physics, and chemistry—who can question methods, expose weaknesses, and advocate for improvements that will reduce discretion and the opportunity for implicit racial bias.

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[140]The New York Commission on Forensic Science and the Texas Forensic Science Commission are examples of independent commissions that were established by state legislatures. *See* N.Y. EXEC. LAW §§ 995-995-f (2012); TEX. CODE CRIM. PROC. ANN. art. 38.01 (West 2014); *see also The Office of Forensic Services*, N.Y. ST. DIV. OF CRIM. JUST. SERVS., https://www.criminaljustice.ny.gov/forensic/aboutofs.htm (last visited Jan. 25, 2022); *Texas Forensic Science Commission*, TEX. JUD. BRANCH, https://www.txcourts.gov/fsc/ (last visited Jan. 25, 2022).

[141]NAS REP., *supra* note 94, at 183.

[142]*Cf.* Risinger et al., *supra* note 103, at 19 ("Research on conformity shows that people rely on the views of others in order to develop their own conclusions, sometimes to gain additional information, other times merely to be in step with their peers.").

[143]Risinger et al., *supra* note 103, at 16.

[144]PCAST REP., *supra* note 1, at 32.

[145]PCAST REP., *supra* note 1, at 32.

C. Mandating Root Cause Analysis

Legislators should mandate a specific protocol for root cause analysis in state-run labs based on the knowledge and experience of other disciplines that use root cause analysis to prevent the recurrence of unwanted outcomes. "Root cause analysis is a process that identifies, in an objective blame-free environment, why an adverse event or near miss occurred."[146] Outside the context of forensics, in industries like engineering, aviation, and medicine, experts examine adverse events and near-miss situations using a root cause analysis that "focuses on 'how' and 'why' something happened, rather than seeking to assign blame."[147] Proper root cause analysis allows stakeholders to develop corrective actions that more specifically address the true cause of the adverse event, resulting in more effective and cost-efficient action.

Some states have urged root cause analyses in criminal justice contexts. For example, the New York State Justice Task Force issued recommendations on how to convene and implement root cause analysis in the criminal justice system to prevent wrongful convictions.[148]

Root cause analysis has also been used in the forensic context. For example, in 2018, the FBI selected a third-party risk management company to analyze the root and cultural causes that contributed to reporting and testimonial errors in microscopic hair comparison analysis across the country.[149] As another example, the National Commission on Forensic Science recommended that all forensic science service providers and forensic science medical providers adopt protocols for proper root cause analysis.[150] Similarly, the Texas Commission on Forensic Science mandates, and actively

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[146]Recommendations Regarding Root Cause Analysis, N.Y.S. JUST. TASK FORCE (2015) [hereinafter NYS JUST. TASK FORCE, *Root Cause Analysis*], http://www.nyjusticetaskforce.com/pdfs/JTF-Root-Cause-Analysis.pdf [https://perma.cc/QX52-M5R2], at 2.

[147]NYS JUST. TASK FORCE, *Root Cause Analysis*, *supra* note 146, at 2.

[148]NYS JUST. TASK FORCE, *Root Cause Analysis*, *supra* note 146, at 2.

[149]ABS GROUP, ROOT AND CULTURAL CAUSE ANALYSIS OF REPORT AND TESTIMONY ERRORS BY FBI MHCA EXAMINERS (2018), https://vault.fbi.gov/root-cause-analysis-of-microscopic-hair-comparison-analysis/root-cause-analysis-of-microscopic-hair-comparison-analysis-part-01-of-01/view [https://perma.cc/98B2-KQP5].

[150]Nat'l Inst. Standards & Tech., Nat'l Comm'n on Forensic Sci., Recommendation to the Attorney General: Root Cause Analysis (RCA) in Forensic Science (Aug. 11, 2015), https://www.justice.gov/archives/ncfs/file/786581/download [https://perma.cc/4E4S-Y8SS]. The Trump Administration's Department of Justice later decided not to renew the NCFS's charter. *See* Jules Epstein, *The National Commission on Forensic Science: Impactful or Ineffectual?*, 48 SETON HALL L. REV. 473 (2018).

trains on, root cause analysis for labs under its purview.[151] Root cause analysis can help labs understand where implicit racial bias may be impacting results and adopt corrective actions to prevent those impacts in the future.

D. Cross-Examining Forensic Examiners on Implicit Bias

Great trial attorneys are constantly assessing biases (in jurors, witnesses, judges, and opposing counsel) and figuring out how to fight them, adapt to them, or use them to a client's advantage. The need to address implicit racial bias requires the same perceptivity and willingness to think creatively.

The research confirms that it is possible to reduce bias, and the recommendations above illustrate steps that can be taken to do so. For those labs that are unwilling to meaningfully address the impact of implicit racial bias, forensic examiners can be confronted on cross-examination, whether at trial or at pre-trial hearings on scientific validity. Defense attorneys should avoid the trap of believing that racial bias exists only if there is explicit evidence of racism (e.g., a racial slur). Implicit racial bias exists regardless of intent, and defense attorneys can educate the court and the jury about how that bias contaminates decision making, *even if we assume that the examiner is still a good and decent person*. Defense attorneys can consider questions related to:

- the existence of implicit bias, such as:
  - ◯ the fact that scientific research confirms the pervasiveness of implicit bias,[152]
  - ◯ the 2009 report by the National Academy of Sciences that encourages labs to recognize bias in forensic analysis and take affirmative steps in response,[153] and
  - ◯ the 2016 report by the President's Council of Advisors on Science and Technology that repeats the need for independence in forensic analysis to avoid bias.[154]
- concrete actions that have been taken in non-forensic areas to actively address and prevent bias from impacting behavior, such as:

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[151] *See* TEX. FORENSIC SCI. COMM'N, THIRD ANNUAL REPORT 23 (2015), https://www.txcourts.gov/media/1440351/fsc-annual-report-fy2015.pdf [https://perma.cc/YD4J-T6A8]; *see also* Tex. Forensic Sci. Comm'n, Analyst and Technician Licensing Examination Basic Information Regarding Examination Content, Scoring, and Syllabus, https://www.txcourts.gov/media/1442004/licensing-exam-syllabus-07112018.pdf [https://perma.cc/V3C8-22AB] (last visited Nov. 24, 2021).

[152] *See* Kang et al., *supra* note 19, at 1130–31.

[153] NAS REP., *supra* note 94, at 184.

[154] PCAST REP., *supra* note 1, at 31.

- ○ bias training in jury orientation and jury instructions that some courts have instituted to reduce bias in jurors,[155]
- ○ the implementation of blind or double-blind procedures in clinical trials, as well as academics, to eliminate discretion and reduce bias,[156] and
- ○ the use of techniques that require academic interviewers to consider evidence that supports the opposite conclusion in admissions processes.[157]

- lab policies that fail to address implicit bias, such as:
  - ○ the lack of any written policy to address implicit bias,
  - ○ the lack of a forum in which examiners are encouraged to discuss and address implicit bias in their work, and
  - ○ specific policies that allow for discretion in the analysis.
- what the examiner did that may have allowed bias to infect the results, such as:
  - ○ having access to task-irrelevant information about the suspect, including the suspect's race or ethnic background,[158]
  - ○ relying on non-blinded verification or technical review, which can increase confirmation bias and create a self-affirming feedback loop to bolster certainty,[159]
  - ○ discarding or minimizing evidence that supports the opposite conclusion, and
  - ○ lowering the standard to reach an opinion consistent with guilt.
- what the examiner failed to do to reduce the dangers of bias in that case,[160] such as:
  - ○ failing to implement blind or double-blind analysis,
  - ○ failing to use Linear Sequential Unmasking,

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[155] *See, e.g.*, *Unconscious Bias Juror Video*, U.S. DIST. CT., W.D. WASH., https://www.wawd.uscourts.gov/jury/unconscious-bias [https://perma.cc/3DRR-8CTT] (last visited Nov. 24, 2021); *Understanding the Effect of Unconscious Bias*, OR. JUD. BRANCH, https://www.courts.oregon.gov/courts/lane/jury/Pages/Video-Gallery.aspx [https://perma.cc/GSL2-3BPR] (last visited Nov. 24, 2021); *Duty of Jury*, NINTH CIR. MANUAL OF MODEL CRIMINAL JURY INSTRUCTION 1.1 (2019), https://www.ce9.uscourts.gov/jury-instructions/node/300 [https://perma.cc/M6MP-TGH6].

[156] *See* Risinger et al., *supra* note 103, at 9.

[157] *See, e.g.*, Quinn Capers IV, *Rooting Out Implicit Bias in Admissions*, ASS'N OF AM. MED. COLLEGES (Feb. 4, 2019), https://www.aamc.org/news-insights/insights/rooting-out-implicit-bias-admissions [https://perma.cc/B9FS-3PNK].

[158] Dror et al., *supra* note 93, at 8001, 8003; Risinger et al., *supra* note 103, at 31.

[159] Kaye N. Ballantyne, Gary Edmond & Bryan Found, *Peer Review in Forensic Science*, 277 FORENSIC SCI. INT'L 66 (2017).

[160] Dror et al., *supra* note 93, at 7999.

- ○ failing to follow the scientific method, including testing alternate hypotheses,
- ○ failing to document and account for inconsistent data, and
- ○ failing to follow the principle of falsification that requires scientists to determine whether the hypothesis can survive continuing and serious attempts to falsify it.[161]

Defense attorneys can also address these issues in informal conversations with prosecutors to highlight weaknesses and create a culture where implicit racial bias is confronted in the same way as any other harmful evidence. A critical eye and open dialogue, rather than avoidance, is an essential step forward. Indeed, much of the progress in forensic reform has resulted from years of sustained and, at times, messy and uncomfortable conversations that have shed further light on problems with forensic methods or on impediments to change. Raising the issue of implicit racial bias in forensics within individual cases elevates it as a priority for prosecutors and the labs themselves.

IX. CONCLUSION

Implicit bias in forensic testimony is an undeniable barrier to racial justice and equity. Research confirms the need to act preventatively, rather than waiting for proof of explicit racial bias in any individual case. The demand for concrete evidence of racism in a particular case may fit with our natural desire for proof, but it conflicts with the very phenomenon that we seek to prevent. Implicit bias is *implicit*.

The question is not, where is the evidence of racism? We have that evidence: we have decades of research on implicit racial bias; we have known data on disparate outcomes; we have written and unwritten lab policies that expose examiners to irrelevant contextual information, like race, and reveal a worrisome level of individual discretion in many forensic methods.

The question is, given that racial bias can be unintended and can persist hidden from view, what has the lab or the examiner done to protect their opinions from contamination, just as the lab would protect any other piece of evidence? A desire for a more fair and transparent criminal justice system means taking action based on the research and the disproportionate outcomes that paint a very real picture of the presumption of guilt facing people of color. Focusing on the role that forensic testimony plays in perpetrating that presumption is crucial to our pursuit of justice.

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[161]Failing to follow the principle of falsification results in confirmation bias because examiners have a natural tendency "to test a hypothesis by looking for instances that confirm it rather than by searching for potentially falsifying instances." *See* Risinger et al., *supra* note 103, at 7.