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## The Noisy "Silent Witness": The Misperception and Misuse of Criminal Video Evidence

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# THE NOISY “SILENT WITNESS”: THE MISPERCEPTION AND MISUSE OF CRIMINAL VIDEO EVIDENCE

AARON M. WILLIAMS\*

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## INTRODUCTION

“A very rarely discussed property of data: it is toxic in large quantities—even in moderate quantities.”  
— Nassim Nicholas Taleb<sup>1</sup>

The statistical concept of “noise” can be described, in very general terms, as random or nonrepresentative data, which can be confused with and obscure meaningful data, called “signal.”<sup>2</sup> If, in the process of collecting more data, most of the data added is not meaningful, the “signal-to-noise-ratio” drops, the quality of the data set as a whole is reduced, and inferences made based upon it will be less accurate.<sup>3</sup> The law has its own mechanisms for preventing “noise” from reaching finders of fact.<sup>4</sup> Unfortunately, noise is, by definition, hard to distinguish from signal.

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1. NASSIM NICHOLAS TALEB, *ANTIFRAGILE: THINGS THAT GAIN FROM DISORDER* 126 (2012).

2. *Id.*

3. *Id.* at 126–27 (describing the diminishing marginal value of certain kinds of financial market information, such that daily updates contain more random variation than information about meaningful trends, and how consequently receiving this information leads to worse trading decisions and greater unhappiness).

4. *See, e.g.*, FED. R. EVID. 403 (permitting courts to “exclude relevant evidence if its probative value is substantially outweighed by a danger of . . . unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative

In the decade since *Scott v. Harris*,<sup>5</sup> there has been considerable academic commentary on—and psychological research demonstrating—the deceptive ambiguity of video evidence, its potential for biased perception and interpretation, and the need for greater scrutiny of and caution in its use.<sup>6</sup> Dan Kahan and his colleagues responded to *Scott* by conducting a study of 1350 people, which revealed that a sizable minority of the sample viewers—like Justice Stevens—did not interpret the video as depicting so dangerous a car chase as would justify the use of deadly force.<sup>7</sup> The tendency to interpret the video this way was found to be correlated with demographic characteristics, such as race, geographic region, and income, and with holding certain beliefs and values.<sup>8</sup> Much of the research of biases affecting the perception or interpretation of video has studied the influence of such personal or dispositional traits of the viewer.<sup>9</sup>

Much of the criticism of *Scott* was related to the Court's decision to resolve the matter on summary judgment and to the problems of judges deciding questions of fact in reliance of deceptively ambiguous video.<sup>10</sup> Considering the unseen influence of ideology on interpretation, it is tempting to believe that judgments of politically sensitive matters should be made by juries, who, hopefully representing a fair cross section of the community, will contain enough diversity of opinion to be insulated from the effects of such biases.<sup>11</sup> If *Scott* had gone to a jury, and if that jury contained

evidence”).

5. 550 U.S. 372 (2007). *Scott* was a § 1983 action against a police officer who ended a car chase by intentionally ramming the plaintiff's vehicle from the road, resulting in the plaintiff's paralysis. *Id.* at 374–75. Relying on the officer's “dash cam” video, the Court ruled 8–1, granting summary judgment for the officer on the ground that no reasonable jury could find that the officer's decision was unreasonable in light of the public danger created by the car chase. *Id.* at 386. Interpreting the video quite differently, Justice Stevens dissented, emphasizing facts such as the fleeing plaintiff's use of his turn signals before changing lanes to pass upcoming vehicles, the absence of any pedestrians in the area, and the police officers' use of their sirens to alert drivers to the approaching chase, and concluding that the public threat was not so serious as to warrant deadly force. *Id.* at 389–95.

6. See, e.g., Adam Benforado, *Frames of Injustice: The Bias We Overlook*, 85 IND. L.J. 1333 (2010); Dan M. Kahan, David A. Hoffman & Donald Braman, *Whose Eyes Are You Going To Believe? Scott v. Harris and the Perils of Cognitive Illiberalism*, 122 HARV. L. REV. 837 (2009); Jessica Silbey, *Cross-Examining Film*, 8 U. MD. L.J. RACE, RELIGION, GENDER & CLASS 17 (2008).

7. Kahan et al., *supra* note 6, at 864–70.

8. *Id.* at 867 (finding that of all the factors examined, race had the strongest impact on responses to the questions about the video and the reasonableness of Scott's conduct, but that the presence of “hierarchical” versus “egalitarian” worldviews also had significant effects).

9. See, e.g., *id.* at 837; Dan M. Kahan, David Hoffman, Danieli Evans, Neal Devans, Eugene Lucci & Katherine Cheng, *Ideology or Situation Sense: An Experimental Investigation of Motivated Reasoning and Professional Judgment*, 164 U. PA. L. REV. 349, 440 (2016); Roseanna Sommers, *Will Putting Cameras on Police Reduce Polarization?*, 125 YALE L.J. 1304, 1348 (2016).

10. See, e.g., Kahan et al., *supra* note 6; David Kessler, *Justices in the Jury Box: Video Evidence and Summary Judgment in Scott v. Harris*, 31 HARV. J.L. & PUB. POL'Y 423 (2008); Naomi Mezey, *The Image Cannot Speak for Itself: Film, Summary Judgment, and Visual Literacy*, 48 VAL. U. L. REV. 1 (2013); Silbey, *supra* note 6.

11. See Dan M. Kahan, David A. Hoffman, Donald Braman, Danieli Evans & Jeffrey J.

a member of the sizable minority prone to interpret the video as Justice Stevens did, then that jury may have hung.<sup>12</sup>

But while many crimes implicate a juror’s ideological judgments to some degree, much of the post-*Scott* research about biases affecting the reliability of video evidence has focused on the intensely polarizing topic of police use of force.<sup>13</sup> Considering the current levels of polarization,<sup>14</sup> it may be doubtful that any political solutions could be crafted to address the dispositional biases operating in such partisan arenas—at least for the time being. And considering our system’s traditional deference to the jury and its democratic functions,<sup>15</sup> in many instances it may be debatable whether ideological biases are “errors” which should be corrected at all.<sup>16</sup>

Video evidence, however, is not confined to police use of force cases; several states now require that custodial confessions be recorded,<sup>17</sup> many police departments

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Rachlinski, *They Saw a Protest: Cognitive Illiberalism and the Speech-Conduct Distinction*, 64 STAN. L. REV. 851, 893 (2012) (“Perhaps ‘from the mode of their selection, coming from the various classes and occupations of society, and conversant with the practical affairs of life,’ jurors will enjoy advantages over a single judge, whose ‘habits and course of life’ are necessarily peculiar, in ascertaining the truth when facts are disputed.” (quoting *Mahe v. People*, 10 Mich. 212, 222 (1862))).

12. Whether this would always be desirable is another question. Consider the recent second mistrial of Ray Tensing, the University of Cincinnati police officer indicted for the murder of an unarmed black driver he shot during a traffic stop. Chelsea Bailey & Daniel Arkin, *Ray Tensing: Ex-Police Officer Won’t Be Retried for Third Time in Murder Case*, NBCNEWS (July 18, 2017, 6:32 PM), <https://www.nbcnews.com/news/us-news/ray-tenzing-ex-police-officer-won-t-be-retried-third-n784111> [<https://perma.cc/XW8U-T95K>]. Tensing claimed that he shot the driver, Samuel DuBose, after DuBose’s car started moving forward, causing him to be dragged along and making him fear for his safety. *Id.* The prosecutor argued that Tensing’s body camera video contradicted that claim by showing that Tensing was not physically dragged by the car. *Id.* Despite the video, two juries deadlocked, and the prosecutor decided not to pursue a third trial, concluding that a conviction would not be forthcoming. *Id.*

13. See, e.g., Kahan et al., *supra* note 6; Kahan et al., *supra* note 11; Sommers, *supra* note 9.

14. The arrest of legislation and the numerous other problems creating and created by our current partisan gridlock are a popular subject of study these days. See, e.g., Jessica Bulman-Pozen, *Executive Federalism Comes to America*, 102 VA. L. REV. 953 (2016); Anthony J. Gaughan, *Illiberal Democracy: The Toxic Mix of Fake News, Hyperpolarization, and Partisan Election Administration*, 12 DUKE J. CONST. L. & PUB. POL’Y 57 (2017); David Schoenbrod, *How to Salvage Article I: The Crumbling Foundation of Our Republic*, 40 HARV. J.L. & PUB. POL’Y 663 (2017).

15. See, e.g., Kahan et al., *supra* note 6, at 904 (“Our legal system conspicuously holds forth jury decisionmaking as a means of making the law responsive to, and hence legitimately binding on, individuals of diverse backgrounds.”); Richard A. Primus, *When Democracy Is Not Self-Government: Toward a Defense of the Unanimity Rule for Criminal Juries*, 18 CARDOZO L. REV. 1417 (1997).

16. Cf. Govind Persad, *When, and How, Should Cognitive Bias Matter to Law?*, 32 LAW & INEQ. 31, 60 (2014) (acknowledging that some biases, like those based on racial discrimination, are “normatively indefensible,” but that these should be distinguished from other forms of bias which are not necessarily wrongful).

17. As of 2015, eighteen states and the District of Columbia required (either by statute or judicial decision) that custodial interviews be recorded, most of the law enforcement agencies

are equipping their officers with body-worn cameras (BWCs),<sup>18</sup> which are more often used to prosecute crimes by citizens than by officers,<sup>19</sup> and surveillance cameras are becoming more commonplace as well, at least in some cities.<sup>20</sup> And while this evidence can have many benefits, there are also many cognitive biases which can undermine its reliability. Many such biases are more a function of context, such as camera angle<sup>21</sup> and playback speed,<sup>22</sup> than the disposition or values of the viewer.<sup>23</sup>

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in another four states adopted recording policies voluntarily, and in 2014, the DOJ announced that the FBI, DEA, ATF, and the U.S. Marshals Services would record custodial interviews for federal criminal investigations. *See* THE INNOCENCE PROJECT, IMPLEMENTING ELECTRONIC RECORDING OF CUSTODIAL INTERVIEWS: A PRIMER FOR LAW ENFORCEMENT 2 (2015), <https://legalklx.com/images/Innocence%20Project-Implementing%20Electronic%20Recording%20of%20Custodial%20Interviews.pdf> [<https://perma.cc/AUL7-NQV6>].

18. Mike Maciag, *Survey: Almost All Police Departments Plan to Use Body Cameras*, GOVERNING.COM (Jan. 26, 2016), <http://www.governing.com/topics/public-justice-safety/gov-police-body-camera-survey.html> [<https://perma.cc/54K8-CNXXG>] (describing a nationwide survey of seventy law enforcement agencies, with “95 percent either committed to body cameras or having completed their implementation”); *see also* SHELLEY S. HYLAND, BUREAU OF JUSTICE STATISTICS, BODY-WORN CAMERAS IN LAW ENFORCEMENT AGENCIES, 2016 (2018) (conducting study of over fifteen thousand state and local law enforcement agencies, 44.7% of which had at least some BWCs in service in 2016); LINDA MEROLA, CYNTHIA LUM, CHRISTOPHER S. KOPER & AMBER SCHERER, CTR. FOR EVIDENCE-BASED CRIME POLICY, BODY WORN CAMERAS AND THE COURTS: A NATIONAL SURVEY OF STATE PROSECUTORS (2016), <http://cebcp.org/wp-content/technology/BWCProsecutors.pdf> [<https://perma.cc/3DNW-UQEZ>] (describing a survey of 321 state prosecutors offices; almost two-thirds reported working with body-camera evidence).

19. MEROLA ET AL., *supra* note 18, at 5 (noting that 92.6% of prosecutors from jurisdictions with officers equipped with body cameras reported using the video to prosecute a private citizen, compared with 8.3% who had reported using it to prosecute an officer).

20. *See, e.g.*, Adam Schwartz, *Chicago's Video Surveillance Cameras: A Pervasive and Poorly Regulated Threat to Our Privacy*, 11 NW. J. TECH. & INTELL. PROP. 47, 48–49 (2013) (describing research by the ACLU and statements from officials indicating that as of 2013, Chicago Police Department had a surveillance network of over 20,000 cameras). As is seemingly often the case with video evidence, the number of cameras recording is much easier to find than the amount of video evidence generated or used. *See* Gaynor Hall & Pam Grimes, *Are Surveillance Cameras Making Chicago Safer?*, WGNTV.COM (Feb. 22, 2016, 9:30 PM), <https://wgntv.com/2016/02/22/are-surveillance-cameras-making-chicago-safer> [<https://perma.cc/NK7C-57R5>] (noting that spokesperson from Cook County State’s Attorney’s office claimed they “can’t identify a precise number of cases where cameras were utilized, though they have been helpful in some cases”). Houston has also reportedly seen an uptick in security camera installations. *See* Terry Gross, *With Closed-Circuit TV, Satellites and Phones, Millions of Cameras are Watching*, NPR (Feb. 8, 2018, 2:27 PM), <https://www.npr.org/2018/02/08/584243140/with-closed-circuit-tv-satellites-and-phones-millions-of-cameras-are-watching> [<https://perma.cc/JC4T-JCW3>] (interviewing Robert Draper, journalist from *National Geographic*, who reported that Houston had “very quietly deployed about 900 cameras throughout the city . . . largely because Department of Homeland Security grant money was available to do so”).

21. *See infra* Section I.A.

22. *See infra* Section I.E.

23. *See* Benforado, *supra* note 6, at 1348 (arguing that researchers of dispositional video

While there is a rich body of empirical research about situational biases affecting video evidence, until recently, much of it has been limited to highly specific domains, such as the effects of camera angle on viewer perceptions of confessions.<sup>24</sup> Video from other sources (like surveillance cameras) are sometimes studied as well, but, again, often only in fairly specific contexts, such as the factors affecting the accuracy of identification of subject in surveillance video.<sup>25</sup> While BWCs also receive considerable attention by legal scholars,<sup>26</sup> and have been the subject of numerous empirical studies, most of these have centered around the psychological impact of the camera itself on the behavior of police or the public, rather than the perception, quality, or use of the evidence that body cameras produce.<sup>27</sup>

This Note examines recent developments in the research of situational video evidence biases. Part I examines the current and growing body of psychological research into the various situational biases that can affect the reliability of video evidence and the gaps in this research that require further attention from researchers and legal academics. Because these biases do not "operate in a vacuum,"<sup>28</sup> Part I also examines some of the recent and exciting research into the interaction between situational and dispositional biases. Part II examines the development of camera and video processing technology and its limitations as a means of mitigating such biases. Part III explains how such research could be used to develop heuristics to better assess the admissibility or presentation of video evidence and the need for greater judicial scrutiny of video evidence. This Note concludes by highlighting the potential research about the situational factors affecting the perception that video evidence has for producing insights useful for practitioners conducting criminal trials and

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evidence biases should revise their methodological framework to include and account for the influence of situational factors).

24. See *infra* Section I.A.

25. Anne P. Hillstrom, Lorraine Hope & Claire Lee, *Applying Psychological Science to the CCTV Review Process: A Review of Cognitive and Ergonomic Literature* (Univ. of Portsmouth Dep't of Psychology, Working Paper, 2008), [https://www.researchgate.net/profile/Claire\\_Nee/publication/299364584\\_Applying\\_psychological\\_science\\_to\\_the\\_CCTV\\_review\\_process\\_a\\_review\\_of\\_cognitive\\_and\\_ergonomic\\_literature/links/570baab108aea660813b0c52/Applying-psychological-science-to-the-CCTV-review-process-a-review-of-cognitive-and-ergonomic-literature.pdf](https://www.researchgate.net/profile/Claire_Nee/publication/299364584_Applying_psychological_science_to_the_CCTV_review_process_a_review_of_cognitive_and_ergonomic_literature/links/570baab108aea660813b0c52/Applying-psychological-science-to-the-CCTV-review-process-a-review-of-cognitive-and-ergonomic-literature.pdf) [<https://perma.cc/4WB4-3G3C>]; see, e.g., Eugene M. Caruso, Zachary C. Burns & Benjamin A. Converse, *Slow Motion Increases Perceived Intent*, 113 PROC. NAT. ACAD. SCI. 9250 (2016), <http://www.pnas.org/content/113/33/9250.full.pdf> [<https://perma.cc/372B-KMBP>]; Dawn Grant & David Williams, *The Importance of Perceiving Social Contexts When Predicting Crime and Antisocial Behaviour in CCTV Images*, 16 LEGAL & CRIMINOLOGICAL PSYCH. 307 (2010).

26. See, e.g., Mary D. Fan, *Justice Visualized: Courts and the Body Camera Revolution*, 50 U.C. DAVIS L. REV. 897, 944 (2017); Caren Myers Morrison, *Body Camera Obscura: The Semiotics of Police Video*, 54 AM. CRIM. L. REV. 791 (2017).

27. See CYNTHIA LUM, CHRISTOPHER KOPER, LINDA MEROLA, AMBER SCHERER & AMANDA REIOUX, CTR. FOR EVIDENCE-BASED CRIME POLICY, EXISTING AND ONGOING BODY WORN CAMERA RESEARCH: KNOWLEDGE GAPS AND OPPORTUNITIES (2015), <http://cebc.org/wp-content/technology/BodyWornCameraResearch.pdf> [<https://perma.cc/FJH6-BDJ8>] (noting that comparatively little research has been done into the effects of video evidence on, for example, prosecutorial decision making).

28. Benforado, *supra* note 6, at 1363.

municipalities and police forces adopting video technology, and closes with suggestions for further research.

I. WHAT THEY SEE IS (NOT) ALL THERE IS: THE CURRENT RESEARCH OF SITUATIONAL VIDEO EVIDENCE BIASES

Because some have suggested that the term “bias” is prone to misunderstanding,<sup>29</sup> it may be helpful to start by defining it. “Bias” may be defined as the “systematic variation in judgmental tendencies elicited by some attribute or property of a stimulus,”<sup>30</sup> or, more simply, as “anything tending to influence one in a particular direction.”<sup>31</sup>

One of the central difficulties in discussing cognitive bias is that it necessarily requires some normative assumptions. To say that something influences a person’s perceptions or judgments in a predictable way does not necessarily make this influence wrongful.<sup>32</sup> The American criminal justice system does, however, embrace some basic normative principles—such as avoiding the conviction of the factually innocent,<sup>33</sup> and avoiding arbitrary verdicts<sup>34</sup>—that are regarded as so fundamental that we may treat them as axiomatic.<sup>35</sup> Therefore, this Note attempts to identify biases which are likely to be unjustifiable because research suggests that they can lead to inaccurate verdicts,<sup>36</sup> and biases that are troubling (though not necessarily unjustifiable) because they suggest the influence of some process that most would consider random or unconnected to the proper inquiry the criminal justice system should perform.<sup>37</sup>

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29. Persad, *supra* note 16, at 34–36.

30. Gregory Mitchell & Philip E. Tetlock, *Antidiscrimination Law and the Perils of Mindreading*, 67 OHIO ST. L.J. 1023, 1035 (2006) (providing the example of “a person’s membership in a particular group”).

31. *Bias*, WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY, UNABRIDGED (1981).

32. The criticism that normative claims about proper behavior cannot be directly inferred from empirical or descriptive observations is not new. See DAVID HUME, TREATISE OF HUMAN NATURE, BOOK III: MORALS 241–42 (1740) (expressing the famous “is-ought” distinction). This criticism is still made in this context. See Persad, *supra* note 16, at 63–64 (arguing that “behavioral science does not and cannot show on its own that biases or heuristics are either desirable or objectionable”).

33. See, e.g., *Brown v. Mississippi*, 297 U.S. 278 (1936) (holding that confessions extracted by violent coercion violate the Due Process Clause of the Fourteenth Amendment).

34. See, e.g., *Hurtado v. California*, 110 U.S. 516, 535 (1884) (“Law is something more than mere will exerted as an act of power. It must be not a special rule for a particular person or a particular case, but . . . [should] hear[] before it condemns . . . proceed[] upon inquiry, and render[] judgment only after trial’ . . .” (internal citations omitted)).

35. Notwithstanding Professor Persad’s argument that “legal commentators should be clear about whether they define bias descriptively or prescriptively,” *supra* note 16, at 36, he also acknowledges that some forms of bias, such as racial or sexual discrimination, are “normatively indefensible,” *id.* at 60.

36. See *infra* Section I.A (discussing the camera perspective bias).

37. Persad, *supra* note 16, at 58, offers an excellent example of the latter type of bias, the “reiteration effect”—where confidence in the truth of a statement rises as the statement is repeated—which he argues is likely unjustifiable in the criminal context: “In most cases, it is

As alluded to above, the relevant psychological research of video evidence biases can be roughly divided into two broad categories—dispositional and situational. Dispositional biases are those motivated by culture, beliefs, values, and group commitments (conscious or unconscious) of the viewer.<sup>38</sup> Situational biases result from the interaction between contextual factors and subconscious cognitive processes.<sup>39</sup> These categories are not mutually exclusive, and some biases may be better understood as a product of both dispositional and situational factors.<sup>40</sup>

While this Note primarily discusses situational biases, it does not begin from a premise that dispositional ones are unimportant. Given the pervasive disparity in the punishment of racial minorities,<sup>41</sup> implicit racial biases alone have powerful impacts, but these problems are politically, as well as psychologically, complex.<sup>42</sup> But while racial discrimination is doubtless an unjustifiable form of bias, other kinds of dispositional bias, such as the influence of political ideology on subjective determinations of reasonableness, raise more difficult philosophical questions about whether they are problems in need of solutions.<sup>43</sup>

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very hard to see how any reasonable model of human behavior would treat the number of times a claim is repeated as a legitimate influence on the evaluation of the claim. As such, the influence of the reiteration effect on, for instance, prosecutors’ decisions about whether to prosecute serves to introduce a lottery element into the question of whether a given defendant is prosecuted. Such a lottery seems contrary to the normative aims of the justice system.” (internal citations omitted). *See also infra* Section I.B (discussing the slow-motion intentionality bias).

38. *See, e.g.*, Kahan et al., *supra* note 6; Kahan et al., *supra* note 11; Sommers, *supra* note 9 (studying the extent to which viewers’ feelings about police influenced their assessments of the appropriateness of an incident of police use of force, and finding that video did no better than other presentation formats at mitigating the influence of these ideas on assessments).

39. A useful framework for understanding the operation of these biases is the “dual process” approach. “System 1” is a system of subconscious, intuitive, mental processes (often described as “heuristics” or mental shortcuts) that govern many human judgments and behavior, and which are fast and efficient compared to the slower, more deliberative processes of “System 2,” but which can produce predictable errors in judgment or perception when applied to tasks for which these intuitive processes are ill-suited. *See, e.g.*, DANIEL KAHNEMAN, *THINKING FAST AND SLOW* 21–25 (1st ed. 2011); *see also* Christine Jolls & Cass R. Sunstein, *The Law of Implicit Bias*, 94 CALIF. L. REV. 969 (2006) (explaining the dual-process approach and offering it as a framework for approaching problems of implicit biases against members of socially disadvantaged groups).

40. *See infra* Section I.B (discussing “Racial Salience”).

41. *See, e.g.*, EMILY OWENS, ERIN M. KERRISON & BERNARDO SANTOS DA SILVERIA, QUATTRONE CTR. FOR THE FAIR ADMIN. OF JUST., *EXAMINING RACIAL DISPARITIES IN CRIMINAL CASE OUTCOMES AMONG INDIGENT DEFENDANTS IN SAN FRANCISCO*, SUMMARY REPORT (2017), <https://www.law.upenn.edu/live/files/6792-examining-racial-disparities-may-2017-summary> [<https://perma.cc/SJ2H-HMH3>] (summarizing study showing that defendants of color were held in pretrial custody longer than whites, were convicted of more severe crimes, and received more severe sentences).

42. *See generally, e.g.*, Michael Tonry, *The Social, Psychological, and Political Causes of Racial Disparities in the American Criminal Justice System*, 39 CRIME & JUST. 273 (2010); *see also* Ellen A. Donnelly, *The Politics of Racial Disparity Reform: Racial Inequality and Criminal Justice Policymaking in the States*, 42 AM. J. CRIM. JUSTICE 1 (2016).

43. For example, if ideological traits correlated with conservative political leanings tend

Situational biases are complex as well, but some of the problems created by these biases may be solvable without making large systemic changes. Further, many of these biases are less potentially divisive than ones that are studied almost entirely in the context of police use of force. Many of these situational biases can be fairly characterized as unwanted; they affect people subconsciously in ways they would themselves disapprove of if they were aware of them.<sup>44</sup> As space considerations would make a full taxonomy of the research of video evidence bias impractical, the following summary is instead designed to sketch the landscape of such research the potential scope of the problems they create, and the need for further attention and research in some areas.

#### A. *The Camera Perspective Bias*

An inherent limitation of video evidence is that each camera records from one, limited perspective,<sup>45</sup> which affects the way the playback is perceived in various ways. The longest-studied of these effects, called simply the “camera perspective bias,” refers to the consistently demonstrated tendency of viewers to perceive recorded confessions as being more voluntary when the camera is focused on the suspect making the confession, as opposed to when the camera shows both the suspect and the interrogator.<sup>46</sup> All of these studies pertain to confession videos, but it is worth examining this bias in detail because of the scope and impact of recorded confessions,<sup>47</sup> and because the rich body of studies has revealed many findings that may be applicable to other kinds of criminally relevant video.

Lassiter and colleagues have demonstrated that viewers of confession videos believe confessions to be the most voluntary when the camera focuses only on the suspect, the least voluntary when focused on the interrogator, and have intermediate impressions of voluntariness when viewing “equal-focus” video showing both the

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to make a juror more trustful of authority figures or more prone to punish those that deviate from societal norms, *see* Kahan et al., *supra* note 6, at 859–63, are these biases “errors,” or simply the expression of community values which the jury system exists, at least in part, to vindicate?

44. G. Daniel Lassiter, Melissa J. Beers, Andrew L. Geers, Ian M. Handley, Patrick J. Munhall & Paul E. Weiland, *Further Evidence of a Robust Point-of-View Bias in Videotaped Confessions*, 21 *CURRENT PSYCH.* 265, 283 (2002) (describing the camera perspective bias as a form of “mental contamination”).

45. While some cameras can pan, tilt, and zoom, the camera still only captures whatever is in its field of view, which cannot be changed post hoc. See Part II for more discussion of camera technology and its limitations.

46. Since first observing this bias in 1986, *see* G. Daniel Lassiter & Audrey A. Irvine, *Videotaped Confessions: The Impact of Camera Point of View on Judgments of Coercion*, 16 *J. APPLIED SOC. PSYCH.* 268 (1986), Lassiter and colleagues have been studying this bias for the past several decades. *See* G. Daniel Lassiter, Lezlee J. Ware, Matthew J. Lindberg & Jennifer J. Ratcliff, *Videotaping Custodial Interrogations: Toward a Scientifically Based Policy*, reprinted in G. DANIEL LASSITER & CHRISTIAN A. MEISSNER, *POLICE INTERROGATIONS AND FALSE CONFESSIONS, CURRENT RESEARCH, PRACTICE, AND POLICY RECOMMENDATIONS* 143 (2010) (briefly summarizing the (then) 25-year program of research and its results).

47. *See* THE INNOCENCE PROJECT, *supra* note 17, at 2 (explaining that at least eighteen states mandate the recording of custodial interviews, as do several federal agencies).

interrogator and suspect.<sup>48</sup> The effect is also correlated with observers' judgments that a suspect is guilty<sup>49</sup> and with their evaluations of the severity of punishment the suspect deserves.<sup>50</sup>

Lassiter explains that this camera perspective bias is a manifestation of "illusory causation," a term which describes the tendency of people to "ascribe unwarranted causality to a stimulus simply because it is more noticeable or salient than other available stimuli."<sup>51</sup> In the 1970s researchers began to show that this phenomenon affected perceptions of causality in human interactions.<sup>52</sup> Early researchers hypothesized that illusory causation was a function of memory,<sup>53</sup> but later research has shown that illusory causation and the camera perspective bias "[have] more to do with the perceptual processing system—how people pick, up, register, or attend to information in the first place—than with the conceptual processing system—how they subsequently elaborate, interpret, or remember that information."<sup>54</sup>

This distinction is important because the basic cognitive level at which illusory causation operates may explain why the camera perspective bias is so pervasive.<sup>55</sup> The bias has been observed in an extremely wide variety of settings: the effect persists for confessions by suspects of both sexes,<sup>56</sup> for confessions to violent and

48. Lassiter & Irvine, *supra* note 46, at 272.

49. *See, e.g.*, G. Daniel Lassiter, Lezlee J. Ware, Jennifer J. Ratcliff & Clinton R. Irvin, *Evidence of the Camera Perspective Bias in Authentic Videotaped Interrogations: Implications for Emerging Reform in the Criminal Justice System*, 14 *LEGAL & CRIMINOLOGICAL PSYCH.* 157, 166 (2009).

50. *See* Lassiter et al., *supra* note 44, at 279–82 (discussing Study 4).

51. G. Daniel Lassiter, Andrew L. Geers, Patrick J. Munhall, Robert J. Ploutz-Snyder & David L. Breitenbecher, *Illusory Causation: Why It Occurs*, 13 *PSYCHOL. SCI.* 299, 299 (2002). As early as 1935 this phenomenon was shown to affect perceptions of interactions among physical objects. *Id.* (citing K. KOFFKA, *PRINCIPLES OF GESTALT PSYCHOLOGY* (1935) (describing a study in which observers in a dark room were shown a widening gap between two pinpoints of light, which showed that observers judged the point they were looking at to be the one moving, even when it was not)).

52. *Id.* (citing Shelly E. Taylor & Susan T. Fiske, *Point of View and Perceptions of Causality*, 32 *J. PERSONALITY & SOC. PSYCH.* 439 (1975) (describing a study which showed that the vantage point from which observers viewed a casual conversation affected their perceptions of how much influence each participant had in the conversation)).

53. *Id.* at 304. (citing Susan T. Fiske, David A. Kenny & Shelley E. Taylor, *Structural Models for the Mediation of Salience Effects on Attribution*, 18 *J. EXPERIMENTAL SOC. PSYCH.* 105 (1982)).

54. G. Daniel Lassiter, *Psychological Science and Sound Public Policy: Video Recording of Custodial Interrogations*, 65 *AM. PSYCHOLOGIST* 768, 770 (2010) [hereinafter Lassiter, *Sound Public Policy*] (citing Lassiter et al., *supra* note 51; Jennifer J. Ratcliff, G. Daniel Lassiter, Heather C. Schmidt & Celeste J. Snyder, *Camera Perspective Bias in Videotaped Confessions: Experimental Evidence of Its Perceptual Basis*, 12 *J. EXPERIMENTAL PSYCH.: APPLIED* 197 (2006); Lezlee J. Ware, G. Daniel Lassiter, Stephen M. Patterson & Michael R. Ransom, *Camera Perspective Bias in Videotaped Confessions: Evidence That Visual Attention Is a Mediator*, 14 *J. EXPERIMENTAL PSYCH.: APPLIED* 192 (2008)).

55. *Id.* (describing the camera perspective bias as "extremely robust and generalizable").

56. *See* G. Daniel Lassiter, R. David Slaw, Michael A. Briggs & Carla R. Scanlan, *The Potential for Bias in Videotaped Confessions*, 22 *J. APPLIED SOC. PSYCH.* 1838, 1844 (1992).

non-violent crimes,<sup>57</sup> for confessions filmed in realistic trial simulations,<sup>58</sup> for authentic recordings of confessions from actual criminal cases,<sup>59</sup> and for confessions viewed by people from diverse backgrounds<sup>60</sup>—including people from countries with cultural traits varying significantly from those of Americans.<sup>61</sup>

The perceptual origins of the bias can also explain why it has proven so difficult to mitigate.<sup>62</sup> In one study, Lassiter and colleagues examined the effects of the bias on people who were tested for “attributional complexity,” a measurement of the tendency and aptitude for some kinds of complex causal reasoning.<sup>63</sup> Despite research showing that people scoring high on such tests tend to perform well in many kinds of judgment tasks,<sup>64</sup> these people had no immunity to the camera perspective bias.<sup>65</sup> Whatever advantages the “attributionally complex” people may have had in

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57. *Id.* at 1846 (finding the camera perspective bias applied to videos of mock suspects confessing to rape, drug trafficking, and burglary); Lassiter & Irvine, *supra* note 46, at 270 (shoplifting).

58. G. Daniel Lassiter, Andrew L. Geers, Ian M. Handley, Paul E. Weiland & Patrick J. Munhall, *Videotaped Interrogations and Confessions: A Simple Change in Camera Perspective Alters Verdicts in Simulated Trials*, 87 J. APPLIED PSYCH. 867, 869 (2002) (recording a confession in a reenactment of an actual criminal trial, professionally filmed in an actual courtroom, with practicing attorneys playing the roles of the prosecutor and defense attorneys, with theatrical actors playing the other principles, and with a retired judge presiding and reading different sets of jury instructions to different study participants).

59. *See* Lassiter et al., *supra* note 44.

60. *See id.* (showing the trial simulation confession video to undergraduates as well as jury-eligible adults of different races, incomes, marital statuses, and population centers of various sizes).

61. *See* Kwangbai Park & Jimin Pyo, *An Explanation for Camera Perspective Bias in Voluntariness Judgment for Video-Recorded Confession: Suggestion of Cognitive Frame*, 36 LAW & HUM. BEHAV. 184, 186 (2012) (finding, *inter alia*, the camera perspective bias affected perceptions of confessions viewed by South Korean subjects, despite South Korea “often [being] considered . . . one of the most collectivistic culture[s]”); *see also* Sara Landström, Emma Roos Af Hjelmsäter & Pär Anders Granhag, *The Camera Perspective Bias: A Case Study*, 4 J. INVESTIGATIVE PSYCH. & OFFENDER PROFILING 199 (2007) (observing the bias in a study performed in Sweden).

62. *See* Lassiter, *Sound Public Policy*, *supra* note 54, at 770.

63. G. Daniel Lassiter, Patrick J. Munhall, Ian P. Berger, Paul E. Weiland, Ian M. Handley & Andrew L. Geers, *Attributional Complexity and the Camera Perspective Bias in Videotaped Confessions*, 27 BASIC & APPLIED SOC. PSYCH. 27, 29 (2005).

64. *Id.* (noting that people scoring high on the “attributional complexity scale” were shown to gather and spend more time considering diagnostically relevant information when making complex causal inferences, and were shown to perform better on many kinds of judgment tasks, but noting that such people were also found to be more prone to the “correspondence bias,” or the tendency to overattribute human behavior to internal (dispositional) causes).

65. *See id.* at 33. Interestingly, people scoring high in the attributional complexity test were somewhat more likely overall to find the confessions voluntary and the suspects guilty, which was ascribed to their demonstrated tendency to view people’s behavior as arising more from internal causes. *See id.* Despite this, people with high and low attributional complexity were influenced by camera perspective to a similar degree. *Id.* at 31. Thus, while dispositional factors can certainly influence people’s interpretations of confession videos at the same time,

higher order reasoning did not help; the error, it seems, is one of perception, not reason.<sup>66</sup>

Lassiter and colleagues later found that experienced judges and professional investigators were likewise without immunity to the camera perspective bias.<sup>67</sup> Other measures, like allowing viewers to deliberate collectively before rendering judgments,<sup>68</sup> have also proven largely ineffective at mitigating the bias, as has reminding viewers of the serious consequences of their decisions and increasing their felt sense of responsibility.<sup>69</sup> The most effective method found for mitigating the bias is "equal-focus" recording, or recording confessions from an angle showing both the investigator and suspect in a single frame.<sup>70</sup>

While there is some evidence that law enforcement agencies are starting to adopt equal-focus recording policies for confessions, much is still unknown about how many jurisdictions are still using suspect-focus recording.<sup>71</sup> While maintaining that equal-focus video would be preferable, researchers, recognizing the potential demand for an alternative, again examined the efficacy of jury instructions.<sup>72</sup> While

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the camera perspective bias itself appears to be largely independent of disposition.

66. *See id.* at 33 ("[I]t appears that attributionally complex and simple people initially registered information from the observed interaction in a similar fashion; it was at this stage of processing that the biasing effects of camera perspective took root. Even though attributionally complex and simple people likely differed in terms of the thoroughness and sophistication with which they subsequently reflected on the information extracted, the damage was already done and could not easily be remedied."); *see also* Lassiter et al., *supra* note 56, at 1846–47 (finding that individuals with high "need for cognition" or tendency to process information carefully and thoroughly, were similarly influenced by camera perspective).

67. *See* G. Daniel Lassiter, Shari Seidman Diamond, Heather C. Schmidt & Jennifer K. Elek, *Evaluating Videotaped Confessions: Expertise Provides No Defense Against the Camera-Perspective-Effect*, 18 *PSYCH. SCI.* 224, 225 (2007).

68. Lassiter et al., *supra* note 44, at 271–75 (discussing Study 1).

69. *See* G. Daniel Lassiter, Patrick J. Munhall, Andrew L. Geers, Paul E. Weiland & Ian M. Handley, *Accountability and the Camera Perspective Bias in Videotaped Confessions*, 1 *ANALYSES SOC. ISSUES & PUB. POL'Y* 53 (2001).

70. Celeste J. Snyder, G. Daniel Lassiter, Matthew J. Lindberg & Shannon K. Pinegar, *Videotaped Interrogations and Confessions: Does a Dual-Camera Approach Yield Unbiased and Accurate Evaluations?*, 27 *BEHAV. SCI. & LAW* 451, 451 (2009) [hereinafter Snyder et al., *Dual-Camera Approach*].

71. *See* THE INNOCENCE PROJECT, *supra* note 17, at 2–6 (conducting a survey of 111 law enforcement agencies in Massachusetts and Wisconsin; seventy percent of respondents reporting either using equal-focus recording or recording with multiple cameras to capture both the interrogator and the suspect). The number of agencies using the equal-focus (rather than multi-camera) setup was not reported, and of the agencies using the multi-camera setup, it is unclear how often only the video from the suspect-focus camera was used in court. Further, the survey only covered agencies in two of the eighteen states (as of 2015) mandating recording, and less than a quarter of the law enforcement agencies in each of those states. *See id.* at 2–3.

72. *See* Jennifer K. Elek, Lezlee J. Ware & Jennifer J. Ratcliff, *Knowing When the Camera Lies: Judicial Instructions Mitigate the Camera Perspective Bias*, 17 *LEGAL & CRIM. PSYCH.* 123, 124–25 (2010) (noting that earlier research had mostly shown verbal instructions ineffective at mitigating the camera perspective bias, except ones that situationally distracted

providing preventative instructions with more information about the “direction and magnitude” of the effect to jurors *before* they viewed suspect-focus video<sup>73</sup> did mitigate the effects of the bias somewhat better than instructions in previous studies,<sup>74</sup> the researchers acknowledge that more study is needed before these instructions should be used in court.<sup>75</sup> As mentioned at the outset, bias is not inherently problematic.<sup>76</sup> Some could argue that a juror is more likely to find a suspect’s confession genuine and voluntary when looking directly at them because their confessions, are, in fact, genuine and voluntary.<sup>77</sup> Unfortunately, more recent studies have suggested that camera perspective also influences the observer’s ability to differentiate accurate from false confessions.<sup>78</sup> In one such study, confessions independently known to be genuine or false<sup>79</sup> were exhibited in various formats, with the formats showing more of the suspect’s face or body producing the least accurate assessments of whether the confession was genuine.<sup>80</sup> In accord with research showing the inability of people to accurately detect deception from body language

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people from attending to the visual details of the video, which they recognized were unlikely to be popular with courts, since they amount to instructions to pay less attention).

73. *Id.* at 125–26. The instructions were modeled on other research in jury instructions showing that such directions must explain both the intensity of the bias and how it affects people in order to work, and must occur before jurors see the video, because instructions afterward cannot correct for initial biased perception. *Id.* (describing the “flexible correction model” of bias correction).

74. *Id.* at 130–31.

75. *Id.* (noting that further research is needed to better understand the causal mechanism of how the instruction mitigated the bias and whether their results would generalize to confessions obtained through different interrogation tactics). The jury instruction used could face resistance by practitioners as well; despite findings that the jury instruction only had significant effects on judgments of guilt for jurors watching false confession videos, *see id.* at 130, some might still object to the language of the jury instruction as suggestive of manipulation or bad faith by the interrogator, *see id.* at 135 (“[B]ecause people are unable to see the actions of the detective that the suspect is reacting to[,] they . . . perceive the suspect as being more responsible for the situation and the information exchanged. . . . [W]e ask that while viewing the video, you keep in mind that the suspect is reacting to the detective.”).

76. *See supra* notes 29–37 and accompanying text. Lassiter is also careful to acknowledge this point. Lassiter, *Sound Public Policy*, *supra* note 54, at 770 (“[I]t is important to note that the presence of a bias in judgment does not necessarily impugn the accuracy of that judgment.”).

77. Lassiter, *Sound Public Policy*, *supra* note 54, at 771.

78. *See Snyder et al.*, *supra* note 70.

79. In Experiment 2, the researchers obtained false confessions in laboratory settings by tricking some participants into falsely confessing to crashing a computer by mistake in order to protect (they thought) the professional reputations of people planted there by the experimenters. *Id.* at 460. *But see infra* notes 89–90 and accompanying text (discussing criticisms of this method).

80. The most accurate judgments were associated with the interrogator-only format, followed by audio-only (producing similar judgments to the written-transcript and equal-focus formats), and then a considerable decline in accuracy for versions showing only the suspect’s face, and, worst of all, the standard suspect-focus format (showing the suspect’s body and face). Snyder et al., *supra* note 70, at 462 tbl.2.

and facial expressions,<sup>81</sup> the researchers reasoned that the formats making more of this often misleading information available "lead observers astray."<sup>82</sup>

Recognizing that many members of law enforcement may be resistant to equal-focus camera policies because they preclude a direct view of the suspect's face, Lassiter and colleagues also experimented with a dual-camera approach.<sup>83</sup> Attempting to avoid placing visual salience on the suspect while retaining access to a direct view of the suspect's face, they used footage from two cameras, one focusing directly on the interrogator and another directly on the suspect, to create a composite video displaying both views side by side.<sup>84</sup> While the dual-camera view did largely eliminate the traditional camera perspective bias (i.e., heightened perceptions of voluntariness and guilt when confessing defendants are more salient)<sup>85</sup> a subsequent test revealed that the dual-camera method produced among the least accurate judgments of whether the suspect was guilty.<sup>86</sup> It seems that the accuracy problems created by suspect-focus video are rooted more in the content of the video (access to direct views of the suspect's face) rather than salience or illusory causation.

While these studies provide evidence that formats showing more of the suspect's face reduces the accuracy of viewer judgments, more study of this phenomenon might still be necessary to convince some policymakers to act. For instance, the false confessions used in the accuracy study from 2009<sup>87</sup> were obtained (or created) via a method<sup>88</sup> that has received criticism as not eliciting a knowingly false confession.<sup>89</sup> Others have suggested that laboratory-generated confessions may not be representative of real-world confessions for other reasons.<sup>90</sup> Video from authentic

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81. Charles F. Bond, Jr. & Bella M. DePaulo, *Accuracy of Deception Judgments*, 10 PERSONALITY & SOC. PSYCHOL. REV. 214, 217, 225 (2006) (performing a meta-analysis of 206 separate lie-detection studies, finding, *inter alia*, that people are less accurate in judging lies presented in a visual format as opposed to audio or written formats).

82. Snyder et al., *Dual-Camera Approach*, *supra* note 70, at 463. Viewers of suspect-focus videos have also been shown more likely to miss legally salient facts. *See* Lassiter, *Sound Public Policy*, *supra* note 54, at 771 (describing another study in which observers of suspect-focus confessions were worse in detecting that the interrogator directly threatened the suspect).

83. Snyder et al., *Dual-Camera Approach*, *supra* note 70, at 456.

84. *Id.*

85. *Id.* at 459 (Experiment 1).

86. Only suspect-focus video was worse than the dual-camera view in terms of accuracy. *Id.* at 462. The only formats found to improve accuracy over suspect-focus video were equal-focus video and formats that do not show the suspect at all. *Id.* at 462 tbl.2. The most accurate judgements were produced by audio only, written transcript, and video showing only the interrogator. *Id.*

87. *Id.* at 460 (Experiment 2).

88. *See supra* note 79 (describing method for generating false confessions used in Experiment 2).

89. *See* Christopher Slobogin, *Manipulation of Suspects and Unrecorded Questioning: After Fifty Years of Miranda Jurisprudence, Still Two (or Maybe Three) Burning Issues*, 97 B.U.L. REV. 1157, 1184 (2017) (summarizing findings suggesting that some forms of such a "computer crash paradigm" may only cause participants to confess because they actually believe, correctly or not, that they are guilty).

90. *See, e.g.,* Aldert Vrij, Samantha Mann, Emma Robbins & Mark Robinson, *Police Officers Ability to Detect Deception in High Stakes Situations and in Repeated Lie Detection*

confessions independently known to have been false may be difficult to come by,<sup>91</sup> and it may be still more difficult to find such videos shot from the multiple angles necessary for a direct study of the camera perspective bias.<sup>92</sup> Perhaps cases of exoneration by DNA evidence<sup>93</sup> will provide researchers with the materials to more conclusively show that camera perspective contributes to inaccurate assessments of whether confessions are genuine. For now, even if the evidence that camera perspective affects the accuracy of verdicts is not conclusive, it should be strong enough to raise serious questions about the wisdom of suspect-focus camera policies.

### *B. Racial Salience & Other Effects of Selective Attention*

While equal-focus camera policies were found to be the most effective solution to the biases shown in the previous section, some newer research has suggested that equal-focus video may create problems of its own. A study in 2010 found that white viewers shown equal-focus video of confessions were more likely to judge confessions made by racial minorities as voluntary.<sup>94</sup> However, viewers were also given tests designed to identify implicit biases against minorities, and researchers found that racial attitudes could not explain viewers prejudicial judgments against minority suspects alone.<sup>95</sup> More interestingly, a follow-up study found that the white

*Tests*, 20 APPLIED COGNITIVE PSYCHOL. 741, 742–43 (2006) (noting that for university students making false confessions in laboratory settings, the stakes for being believed (or not) are lower than for suspects, confessing to crimes, and that students possess different characteristics (e.g., higher average intelligence) than criminal suspects).

91. For example, one study described above used video created in a simulation based on the transcripts from the later recanted confession of Bradley Page, who was convicted of murdering his girlfriend. Snyder et al., *Dual-Camera Approach*, *supra* note 70, at 457 (Experiment 1). But even if the researchers had had actual video of Page's confession, it is not entirely certain that Page's confession was false. While several psychological and legal researchers believe that Page's confession was coerced, *id.*, others have expressed doubt that Page was factually innocent, *see* Paul G. Cassell, *The Guilty and the "Innocent": An Examination of Alleged Cases of Wrongful Conviction from False Confessions*, 22 HARV. J. L. & PUB. POL'Y 523, 560–64 (1999). As the study in question was testing the influence of presentation format on relative judgments of how voluntary the confession was (and not the objective accuracy of these judgments), *see* Snyder et al., *Dual-Camera Approach*, *supra* note 70, at 459, whether Page's confession was actually false was not directly relevant in this study. But this does illustrate the problem of finding "true" false confessions.

92. *Cf.* Lassiter et al., *supra* note 49, at 161–62 (describing difficulties in finding video of authentic confessions shot from enough angles to conduct a "perfect" experiment).

93. *See, e.g.*, Steven A. Drizin & Richard A. Leo, *The Problem of False Confessions in the Post-DNA World*, 82 N.C. L. REV. 891, 925–30 (2004) (describing a dataset of 125 confessions shown to be "indisputably false").

94. Jennifer J. Ratcliff, G. Daniel Lassiter, Victoria M. Jager, Matthew J. Lindberg, Jennifer K. Elek & Adam E. Hasinski, *The Hidden Consequences of Racial Salience in Videotaped Interrogations and Confessions*, 16 PSYCHOL. PUB. POL'Y & L. 200, 206–08 (2010) (Study 2). Viewers saw one of three versions of the same scripted confession (to a hit-and-run crime), with the suspect being portrayed by a Caucasian, African American, or Chinese American actor. *Id.* In all versions the interrogator was white. *Id.* at 209.

95. Statistically controlling for racial biases found in the questionnaires, the "racial salience bias still emerged in judgments of voluntariness." *Id.* at 209. Researchers also noted

viewers’ judgments were significantly less harsh when the suspect and interrogator were members of the same minority group.<sup>96</sup>

Drawing on prior research showing that increased visual attention to suspects heightened the phenomenon of “illusory causation” and caused harsher judgments against them,<sup>97</sup> and other research showing that minority group members tend to receive more visual attention by majority group observers,<sup>98</sup> the researchers reasoned that this “racial salience” effect resulted more from the contrast between the suspect of color and the white detective (causing visual attention to be drawn to the suspect), rather than from racial stereotypes *per se*.<sup>99</sup>

If this hypothesis is true, then this racial salience effect might be considered more of a situational bias than a dispositional one. Even still, this would not mean that dispositional factors do not also play a role in directing visual attention—in a later study, other researchers found that suspects who were simply *believed* to be members of minority groups also received more visual attention and harsher judgments.<sup>100</sup> Research from outside the confession context has shown that drawing more visual attention to members of perceived outgroups can also increase the degree to which dispositional biases against these groups affect judgment.<sup>101</sup>

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that “although Caucasians were rated as more likely to commit a hit-and-run crime than were Chinese Americans, assessments of voluntariness and guilt were harsher for the Chinese American suspect than for the Caucasian suspect.” *Id.*

96. *Id.* at 210–12 (Study 3). This study used the same equal-focus confession video from Study 2 in which the suspect was Chinese American, along with an alternate version in which the interrogator was also Chinese American. *Id.* at 210. Judgments against the suspect were harsher in the version where the detective was white. *Id.* at 211.

97. *Id.* at 202 (citing Ware et al., *supra* note 54).

98. *Id.* at 203.

99. *Id.* at 204. In addition to explaining the odd results of Study 3, the researchers further supported this hypothesis by giving viewers surveys designed to test the amount of visual attention paid to suspects, which was predictably higher when the suspect and detective were of different races. *Id.* at 210–11.

100. See Kerri L. Pickel, Todd C. Warner, Tarah J. Miller & Zachary T. Barnes, *Conceptualizing Defendants as Minorities Leads Mock Jurors to Make Biased Evaluations in Retracted Confession Cases*, 19 PSYCHOL. PUB. POL’Y & L. 56, 59–62 (2013) (finding that viewers shown the same recording of a racially ambiguous suspect paid the suspect more visual attention and judged the suspect more harshly when they were led to believe that the suspect was Arab American than if they were led to believe the suspect was white). In a follow-up study, a similar effect was noticed where viewers were led to believe the suspect was gay. *Id.* at 62–65.

101. See Yael Granot, Emily Balcetis, Kristin E. Schneider & Tom R. Tyler, *Justice Is Not Blind: Visual Attention Exaggerates Effects of Group Identification on Legal Punishment*, 143 J. EXPERIMENTAL PSYCHOL.: GEN. 2196 (2014). In one study, participants were randomly assigned to “blue” or “green” groups, being told the assignment was based on their similar responses in a “bogus personality inventory.” *Id.* at 2202–04. Participants watched a video of two people (apparently members of the blue and green groups) fighting. *Id.* Viewers who more strongly believed that members of the perceived outgroups were different from them judged the outgroup members in the video as deserving more severe punishment, but only among viewers who directed more visual attention to outgroup members (determined via eye-tracking technology). *Id.* Other studies found a similar “attention divides” effect where heightened visual attention to a police officer increased the influence of viewers’ attitudes about police on

The mediating effects of visual attention on dispositional biases is an exciting field of study, particularly because some research has suggested that this may enable courts to mitigate the effects of dispositional biases through pre-viewing instructions to jurors to focus visual attention “holistically” rather than on the defendant exclusively.<sup>102</sup> These visual attention effects do, however, present a problem for addressing the camera perspective bias. If the distinctiveness (visual or conceptual) of minority group members draws added attention to them, then equal-focus recording of confessions may mostly benefit members of racial or social majority groups.<sup>103</sup> More study of these effects is needed both to confirm both their scope and generalizability,<sup>104</sup> and to find effective ways of countering them.<sup>105</sup>

### C. Body Camera Perspective Effects

The camera’s limited field of view may also create some unique problems for BWCs. Professor Seth Stoughton, who is generally optimistic about BWCs, has noted some distinct problems with the technology.<sup>106</sup> In an interactive (although nonscientific) poll, he took the still unusual step of exploring the interaction between dispositional biases and situational ambiguity created by camera perspective.<sup>107</sup> Stoughton maintains that BWCs generally become less useful the closer the officer

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their judgments of the officer’s culpability for his use of force. *Id.* at 2198–2201.

102. Yael Granot, Emily Balcetis, Neal Feigenson, & Tom Tyler, *In the Eyes of the Law: Perception Versus Reality in Appraisals of Video Evidence*, 24 *PSYCHOL. PUB. POL’Y & L.* 93, 101 (2018) (noting pilot study wherein white viewers watched a video showing an altercation between a white complaining witness and a black defendant, and such “holistic” instructions to viewers to not focus their visual attention exclusively on the defendant reduced the degree of punishment the viewers thought the defendant deserved). In keeping with the research on the “attention divides” effect, the holistic instructions made more of a pronounced difference for “highly identified” white viewers who were the most likely to show implicit racial bias. *Id.*

103. Ratcliff et al., *supra* note 94, at 213–14. This prospect was unsettling to the researchers as well, who noted the already discrepant treatment that racial minorities receive in the criminal justice system. *Id.*

104. *Id.*

105. *Id.* (suggesting that law enforcement agencies could combat the bias by trying to ensure that racial minorities were interrogated by members of the same minority group). *But see* Pickel et al., *supra* note 100, at 66 (noting it may be impractical to find interrogators of the same minority group as the suspect, particularly in smaller police departments located in less diverse regions).

106. Professor Stoughton, a former police officer, likens body cameras to tools that can provide valuable evidence, but that can sometimes mislead. *See* Bill Nemitz, *Police Body Cameras Are Useful Tools, but They Can Distort the Truth*, *PORTLAND PRESS HERALD* (Feb. 26, 2017), <http://www.pressherald.com/2017/02/26/police-body-cameras-are-useful-tools-but-they-can-distort-the-truth> [<https://perma.cc/WP2U-M997>].

107. Timothy Williams, James Thomas, Samuel Jacoby & Damien Cave, *Police Body Cameras: What Do You See?*, *N.Y. TIMES* (Apr. 1, 2016), <https://www.nytimes.com/interactive/2016/04/01/us/police-bodycam-video.html?mcubz=0> [<https://perma.cc/X72H-W8TF>] (asking readers various questions about their trust of police and asking readers to report their interpretation of ambiguous camera videos and the reasonableness of police action).

wearing them gets to another person,<sup>108</sup> because the close quarters can deprive the viewer of context, while the rapid movement of the camera creates an exaggerated sense of action (a phenomenon he terms "deceptive intensity").<sup>109</sup> Both of these effects are demonstrated rather neatly by one frantic, confusing, BWC video in which a man in a red shirt appears to be in a fist fight with the camera's wearer.<sup>110</sup> The next video, filmed at the same time from a different perspective, reveals the two men are salsa dancing.<sup>111</sup>

Until recently, most of the empirical study of BWCs has been limited to the effects of the camera itself, rather than how the video produced by BWCs is used or perceived.<sup>112</sup> In a new study, researchers examined both the influence of camera perspective and of dispositional factors on the perception of video showing police use of force.<sup>113</sup> Two groups of participants, university students and students in Quebec's Police Academy, watched one video of the same incident of lethal force from two different angles, filmed either from a surveillance camera or from a BWC.<sup>114</sup>

While the university students were overall more inclined to say that the officer's use of force was unreasonable and that the officer should be reprimanded or receive additional training, camera perspective did not affect the university students' judgments but did produce small but significant differences in the number of police candidates who thought that the officer should receive additional training.<sup>115</sup> Further, while camera perspective did not have a significant effect on the police candidates' overall assessments of whether use of force was unreasonable,<sup>116</sup> the police candidates who saw the BWC video were significantly more likely to think that the officer "fired too soon."<sup>117</sup> The researchers reasoned that the wide lens angle of the

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108. Nemitz, *supra* note 106.

109. Williams et al., *supra* note 107.

110. *Id.* ("Up Close."). Stoughton also notes that when worn on the chest, the perspective often makes similarly sized subjects appear larger than the officer. Nemitz, *supra* note 106.

111. Nemitz, *supra* note 106. For other episodes illustrating how the limited frame (or "fragmented perspective") of police body and dash cameras can mislead the viewer by depriving them of context, see Caren Myers Morrison, *Body Camera Obscura: The Semiotics of Police Video*, 54 AM. CRIM. L. REV. 791, 807–15 (2017).

112. *See supra* note 27 and accompanying text.

113. *See* Rémi Boivin, Annie Gendron, Camille Faubert & Bruno Poulin, *The Body-Worn Camera Perspective Bias*, 13 J. EXPERIMENTAL CRIMINOLOGY 125 (2017).

114. *Id.* at 131–32. The police academy candidates were in the process of completing a fifteen-week training program. *Id.* The video, produced for the study, depicted the officer shoot a man who was making threatening gestures toward the officer with a baseball bat. *Id.*

115. *Id.* at 133, 135 tbl.2.

116. *Id.* at 133, 134 tbl.1.

117. *Id.* at 138 tbl.3 (showing that 18% of police candidates who saw the surveillance video found the officer fired too soon, as opposed to 32.4% of police candidate who saw the BWC video).

BWC may have altered perceptions of distance,<sup>118</sup> which, due to their training,<sup>119</sup> the police candidates may have been more prone to notice or consider in judging how appropriate the timing of the shot was.<sup>120</sup> Researchers also suggested the possibility that the BMV, by offering the point of view of an officer, may have made the police candidates (already more prone to identify with officers) more inclined to empathize with the officer.<sup>121</sup> While interesting, the results of this study are far from conclusive,<sup>122</sup> and whether BWCs affect perceptions of distance (or create identification with officers) among jurors remains to be seen.<sup>123</sup>

One final and interesting possibility mentioned (though not tested) by the researchers here was that wide-angle lenses of some BWCs may create unique problems in police use-of-force cases by providing a jury with more information than was perceptible to the officer at the time.<sup>124</sup> However, while potentially problematic

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118. The researchers noted that many BWCs are equipped with “fisheye” lenses, offering a wide-angle view to capture more peripheral information, which can create visual distortion and make estimation of distances difficult. *Id.* at 137–39. While the researchers reasoned that BWC view seemed to affect perceptions of distance, they noted that it could not be determined whether the BWC view or the surveillance view led to more objectively correct perceptions of distance, only that the BWC view seemed to make the threat appear farther away. *See id.*

119. *See id.* at 130 (noting that “[d]istance is a crucial factor in police use of force; for example, officers in most countries, including Canada, are trained to use their firearm against an assailant armed with a knife or another ‘edged’ weapon if the subject is within a certain distance” (internal citation omitted)).

120. *See id.* at 137 (noting that “[w]hen viewers—such as trained police candidates—have the tools to analyze a situation, they might react more ‘coldly’ to images of controversial interventions and consider various elements before providing their opinion”). They also noted that informal discussion with the police candidates revealed they considered factors such as distance, the presence of other persons in the room to protect, and the lack of alternatives for the officer. *Id.*

121. *Id.* at 140. While filmmakers have used “point of view shots” to deliberately foster identification with the character, *see Morrison, supra* note 111, at 815–17, whether and to what extent BWC video has such an effect on jurors has not received empirical study.

122. Apart from the cause of the observed bias among police candidates being unsettled, the researchers could not determine the bias’s direction—that is, they could not determine whether “the BWC point of view [led] participants to perceive the intervention as more dangerous than it actually was, or [if] the surveillance point of view [led] them to perceive it as less dangerous.” Boivin et al., *supra* note 113, at 139. Further, due to technical problems, the police candidates were forced to watch the video in groups (unlike the undergraduates, who watched individually), *id.* at 132, which also may have affected the police candidates’ judgments.

123. *Id.* at 139 (noting that the university students and police candidates may not be representative of other groups, like members of the general population or actual experienced police officers).

124. Specifically, the researchers noted that some wide-angle lenses used in BWCs have fields of view “considerably larger than what is provided by the average human eye, especially in terms of peripheral vision.” *Id.* at 137 (citing Hans Strasburger, Ingo Rentschler & Martin Jüttner, *Peripheral Vision and Pattern Recognition: A Review*, 11 J. VISION 1 (2011)). They further noted that BWCs may present unique problems in police use of force cases, where the reasonableness of force is to be assessed without the use of hindsight. *Id.* at 139 (citing *Graham v. Connor*, 490 U.S. 386 (1989)).

in police use of force cases, in other cases wider-angle lenses might, by providing more peripheral information, make BWC video less prone to the problem Professor Stoughton observed, wherein they deprive viewers of context in close quarters conditions.<sup>125</sup> Considering the rapid adoption and use of BWCs, understanding the psychological impact of such devices sooner rather than later may enable more informed decisions about camera design and use.<sup>126</sup>

*D. “CSI Effects” and Inferences from the Absence of Video*

Ironically, the misperception that video evidence is perfectly objective may mean that it can bias a jury even when it is absent—or more specifically *because* it is absent when jurors have come to expect it. There are certainly many prosecutors who believe that such an effect exists and that it prejudices juries against them.<sup>127</sup> Some have associated this with the so-called “CSI Effect.”<sup>128</sup> The “CSI Effect” can actually refer to several concepts,<sup>129</sup> one being the idea that media depictions of forensic evidence makes jurors more likely to trust this evidence and vote to convict where it is present.<sup>130</sup> A related idea is that juries, coming to expect forensic evidence, will be biased against the prosecution when it is absent.<sup>131</sup>

But while many surveys have shown that practitioners believe in CSI effects,<sup>132</sup> there is little in the way of empirical evidence confirming these effects exist,<sup>133</sup> and

125. *See supra* notes 108–11 and accompanying text.

126. The implications of such psychological factors in the design and use of camera technology is addressed further in Part II.

127. MEROLA ET AL., *supra* note 18 (conducting a survey of 321 lead prosecutors, “66.9% of respondents feared that jurors might come to expect [body camera] evidence and that a lack of footage might lead jurors to question an account given by an officer or witness”).

128. NANCY G. LA VIGNE, SAMANTHA S. LOWRY, ALLISON M. DWYER & JOSHUA A. MARKMAN, USING PUBLIC SURVEILLANCE SYSTEMS FOR CRIME CONTROL AND PREVENTION: A PRACTICAL GUIDE FOR LAW ENFORCEMENT AND THEIR MUNICIPAL PARTNERS 19–20 (2011), <https://www.urban.org/sites/default/files/publication/27551/412402-Using-Public-Surveillance-Systems-for-Crime-Control-and-Prevention-A-Practical-Guide-for-Law-Enforcement-and-Their-Municipal-Partners.PDF> [<https://perma.cc/QFA3-6ECB>] (noting that attorneys reported that many jurors find video evidence more credible than eyewitness testimony, and that due to the “prevalence of public surveillance technologies in popular culture . . . [j]urors have come to expect advanced forensic and technological evidence and hold unrealistic expectations about the quality of such evidence like camera footage, a phenomenon known as the ‘CSI Effect’ . . . [and a]s a result, jurors may falsely conclude that the defendant is not guilty”).

129. *See* Simon A. Cole & Rachel Dioso-Villa, *Investigating the ‘CSI Effect’ Effect: Media and Litigation Crisis in Criminal Law*, 61 STAN. L. REV. 1335, 1345 (2009) (containing a table summarizing eight types of “CSI Effects,” which the authors discuss with skepticism).

130. *Id.* (calling this the “defendant’s effect”).

131. *Id.* (calling this the “strong prosecutor’s effect”).

132. *See, e.g.*, Michael Johnson, *The “CSI Effect”: TV Crime Dramas’ Impact on Justice*, 15 CARDOZO PUB. L. POL’Y & ETHICS J. 385, 389–90 (2017) (summarizing several surveys and news reports).

133. *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. 45, 45–46 (2017) (describing the research examining the influence of crime

there are several studies suggesting that some of these effects do not exist.<sup>134</sup> However, there has been some recent research supporting the existence of such an effect in the context of video evidence from BWCs.<sup>135</sup> As a theoretical matter as well, it seems plausible that some jurors would draw negative inferences about the credibility of, for example, a police officer testifying about events (inculpatory to the accused) that allegedly occurred while their BWC was off. Indeed, some have argued that such inferences should be made,<sup>136</sup> and several states that mandate recording of custodial confessions have adopted presumptions against the admission of testimony about unrecorded confessions.<sup>137</sup>

While a presumption against the credibility of testimony about unrecorded police encounters may be justifiable in some instances, it may also unfairly prejudice the prosecution's case. The assumption that an officer equipped with a BWC acted in bad faith because there is no video may be unwarranted considering all the good faith reasons why an officer might not record a particular encounter.<sup>138</sup> Regardless,

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dramas on juror decision-making as “in its infancy”).

134. See, e.g., Kimberlianne Podlas, *“The CSI Effect”: Exposing the Media Myth*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 429 (2006); Donald E. Shelton, Young S. Kim & Gregg Barak, *A Study of Juror Expectations and Demands Concerning Scientific Evidence: Does the “CSI Effect” Exist*, 9 VAND. J. ENT. & TECH. L. 331 (2006); Tom R. Tyler, *Viewing CSI and the Threshold of Guilt: Managing Truth and Justice in Reality and Fiction*, 115 YALE L.J. 1050 (2006).

135. Weston J. Morrow, Charles M. Katz & David E. Choate, *Assessing the Impact of Police Body-Worn Cameras on Arresting, Prosecuting, and Convicting Suspects of Intimate Partner Violence*, 19 POLICE Q. 303, 309–10 (2016) (comparing data from two similar areas within the same precinct in Phoenix, Arizona, for fifteen-month periods before and after one area's police officers were equipped with BWCs). The researchers found that “arrests, charges filed, cases furthered, and guilty at trial verdicts decreased substantially among posttest non-camera cases,” where video was unavailable, “when compared with pretest cases and posttest camera cases”. *Id.* at 318.

136. Indeed, some have advocated for such inferences. See Mary D. Fan, *Justice Visualized: Courts and the Body Camera Revolution*, 50 U.C. DAVIS L. REV. 897, 944 (2017) (advocating that, in jurisdictions where recording is required, judges inquire into the reasons for gaps in BWC video, noting that drawing adverse inferences from omissions is common in other areas of the law and arguing that such judicial inquiry would deter selective recording); AM. CIVIL LIBERTIES UNION OF MASS. & UNIV. OF CAL. BERKELEY LAW SAMUELSON LAW, TECH. & PUB. POLICY CLINIC, NO TAPE, NO TESTIMONY: HOW COURTS CAN ENSURE THE RESPONSIBLE USE OF BODY CAMERAS 13–14 (2016) [hereinafter NO TAPE, NO TESTIMONY], [https://www.aclum.org/sites/default/files/wp-content/uploads/2016/11/ACLU\\_BodyCameras\\_11.21\\_final.pdf](https://www.aclum.org/sites/default/files/wp-content/uploads/2016/11/ACLU_BodyCameras_11.21_final.pdf) [<https://perma.cc/4T26-9GWP>].

137. See, e.g., N.J. Ct. R. 3:17, <https://www.judiciary.state.nj.us/attorneys/assets/rules/r3-17.pdf> [<https://perma.cc/GY85-TC7Y>] (requiring, subject to several exceptions, that custodial confessions for most serious felonies be recorded; making failure to record a factor for consideration by the court in admitting the unrecorded statement and by the jury in weighing whether the statement occurred; and providing that the jury must receive a cautionary instruction upon request by the accused); see also NO TAPE, NO TESTIMONY, *supra* note 136, at 12 (describing similar exclusionary rules or rules requiring jury instructions in seven other states).

138. See Karson Kampfe, *Police-Worn Body Cameras: Balancing Privacy and Accountability Through State and Police Department Action*, 76 OHIO ST. L.J. 1154, 1176–77

however justified the skepticism of other “CSI Effects” may be, BWCs (and possibly unrecorded confessions) may represent a special case.<sup>139</sup>

### *E. Slow Motion*

Film scholars have understood for years the power of video to persuade and its potential to mislead.<sup>140</sup> In particular, the technique of slow motion has been noted for its power to manipulate the viewer’s perceptions, making objects appear lighter, footfalls appear softer, and physical blows appear more gentle.<sup>141</sup> The power of video to distort perceptions of reality, combined with video’s perceived objectivity, can make it dangerous when the stakes are raised.<sup>142</sup>

A recent series of studies showed the potential of slow motion to influence criminal juries.<sup>143</sup> In 2013, the Supreme Court of Pennsylvania affirmed the death sentence of Lewis Jordan, who was convicted of first-degree murder for shooting a police officer who interrupted his robbery of a Dunkin’ Donuts.<sup>144</sup> Jordan, who fired the shot around two seconds after the officer approached the business’s door, claimed the shooting was a “reflexive ‘panicky reaction,’” and argued on appeal that allowing the jury to view the surveillance tape of the shooting in slow motion was an abuse of

(2015) (noting that having a BWC on may sometimes be harmful to police-community relations and may deter victims or witnesses from making statements). BWCs can also raise a host of privacy concerns for suspects and the public generally, which prompted the ACLU to revise its position and advocate for police having at least some discretion in recording. *Id.* at 1175–77; *see also* JAY STANLEY, POLICE BODY-MOUNTED CAMERAS: WITH RIGHT POLICIES IN PLACE, A WIN FOR ALL (2015), [https://www.aclu.org/sites/default/files/assets/police\\_body-mounted\\_cameras-v2.pdf](https://www.aclu.org/sites/default/files/assets/police_body-mounted_cameras-v2.pdf) [<https://perma.cc/G379-FXL9>].

139. Unlike the general expectation that video evidence would probably exist if a crime had happened because cameras are prevalent, or the general distrust of witness testimony because forensics are thought to be more reliable, where the witness testifying about unrecorded events had the ability (or legal obligation) to record but did not, there is a special risk that jurors will infer that the witness is not only unreliable but acted in bad faith.

140. *See, e.g.*, Jessica Silbey, *Videotaped Confessions and the Genre of Documentary*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 789, 804 (2006) (“Film is particularly dangerous as a legal tool, I would argue, because of its perceived veracity and its illusion of revelation.”).

141. Sheena Rogers, *Truth, Lies, and Meaning in Slow Motion Images*, in PSYCHOCINEMATICS: EXPLORING COGNITION AT THE MOVIES 149, 153–54 (Arthur P. Shimamura ed., 2013). Rogers, in addition to noting examples of these effects in popular Hollywood films, also performed a series of experiments filming a number of actions, such as a boxer punching a bag, in slow motion, and noting that observer’s perceptions of the amount of force used decreased in direct relation to the playback speed. *Id.* at 156–57.

142. *Id.* at 154 (analyzing use of slow motion by defense attorneys for the police officers on trial for the Rodney King beating; the attorneys removed the sound and used slow motion and freeze-frames to stretch perceptions of the amount of time that had passed between King being tasered and his “erratic behavior” and helped to “illustrate a narrative in which the police perceived King as a PCP-crazed threat who fully controlled his own beating”). For additional analysis of the Rodney King video and several other popular episodes of police brutality, see Morrison, *supra* note 111.

143. Eugene M. Caruso, Zachary C. Burns & Benjamin A. Converse, *Slow Motion Increases Perceived Intent*, 113 PROC. NAT. ACAD. SCI. 9250 (2016).

144. Commonwealth v. Jordan, 65 A.3d 318, 321 (Pa. 2013).

discretion because it “made the relevant time period appear longer than it actually was, and thereby ‘create[d] a false impression’ . . . [of] deliberation, premeditation, and specific intent.”<sup>145</sup>

While the court was unconvinced that the slow-motion playback was prejudicial enough to warrant reversal,<sup>146</sup> the case did attract the attention of researchers, who found evidence that slow-motion video does indeed increase a viewer’s perceptions of intent.<sup>147</sup> In one study, several hundred participants were shown five seconds of surveillance video from a similar shooting at a convenience store, both at regular speed and in slow motion.<sup>148</sup> The “jurors” who saw the slow-motion video were significantly more likely to have perceived the shooting as being done with intent to kill<sup>149</sup> and with “willful deliberate and premeditated intent to kill.”<sup>150</sup>

In a system which requires unanimous jury verdicts, differences in perception like this can have serious consequences. Using the data collected, the researchers performed statistical simulations of 1000 juries,<sup>151</sup> concluding that 150 of the simulated juries would have unanimously voted to convict after seeing the slow-motion video, while only thirty-nine juries would have voted to convict after seeing the video at regular speed.<sup>152</sup> Of course, this study did not account for the potentially moderating effects of jury deliberation.<sup>153</sup> However, given that the researchers also found that drawing attention to the amount of time that had actually passed did very little to mitigate slow motion’s effects on how much time viewers felt had passed (and their judgments of intent),<sup>154</sup> it is possible that little could be said during

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145. *Id.* at 328 (alterations in original).

146. *Id.* at 330–31 (finding no abuse of discretion, noting that the jury was “well aware” of how much time had passed, and that state precedent was clear that specific intent to kill could be formed in less than a second).

147. Caruso et al., *supra* note 143, at 9250.

148. The slow-motion playback was made by showing the video 2.25 times slower than normal speed, which was approximately the speed the jury was shown the video in *Jordan*. *Id.* at 9251 (citing *Jordan*, 65 A.3d at 330 n.3).

149. 77.3% vs. 86.2%. *See id.* at 9251 tbl.1.

150. 73.81% vs. 80.36%. *Id.* at 9251–53.

151. *Id.* at 9254 (describing method for “jury bootstrap analysis” in which “juries” were created by selecting random twelve-person groups of participants from the study).

152. *Id.* at 9251.

153. *Id.* (noting, however, that using slow-motion video quadrupled the odds that jurors would at least begin deliberations ready to convict). Other research has suggested that individual jurors tend to vote in accordance with their initial views after the close of evidence, regardless of deliberations. *See* Dennis J. Devine, Laura D. Clayton, Benjamin B. Dunford, Rasmey Seying & Jennifer Pryce, *Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups*, 7 PSYCHOL. PUB. POL’Y & L. 622, 690–92 (2001).

154. In Study 3, viewers were shown normal and slow-motion video with timestamps indicating the actual time which had passed; one group also received verbal instructions emphasizing the actual passage of time, making clock time salient. Caruso et al., *supra* note 143, at 9252. While making “clock time salient successfully decreased the bias in estimates of clock time, it did not significantly affect the difference in estimates of the time it felt like the shooter had . . . [and, c]ritically, subjective perceptions of time, not estimated clock time, drove judgments of intent.” *Id.*

deliberations that would change the juror’s subjective perceptions of the amount of time that had passed.

Unlike the camera perspective bias, the slow-motion bias has not been directly shown to affect accuracy; the researchers acknowledge that while slow motion increased people’s perceptions of intent, these perceptions were not necessarily wrong.<sup>155</sup> But this effect is troubling—unless slow motion reveals specific facts probative of intent, it is hard to imagine what rational connection playback speed would have to whether or not a video’s subject acted with intent or how such a “lottery” would make such judgments more accurate.<sup>156</sup> There may, of course, be instances in which some legally significant fact can only be readily perceived in slow motion,<sup>157</sup> but some arguments for the necessity of slow-motion video are more tenuous than others.<sup>158</sup> Other times slow motion may actually obscure relevant or exculpatory facts.<sup>159</sup>

On a somewhat more optimistic note, Caruso and colleagues did find that the slow-motion intentionality bias could be partially mitigated by showing people *both* the slow-motion and regular-speed versions of the video.<sup>160</sup> Although, Caruso and

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155. *Id.* at 9253.

156. *Cf.* Persad, *supra* note 16 (offering the “reiteration effect” as an example of such a “lottery”). Slow motion could in fact be worse than a lottery—given slow motion’s predictable influence on judgment, it can potentially be exploited by one litigant or another seeking an upper hand. *See supra* note 142 (discussing the use of slow motion in the Rodney King trial). On balance, though, slow motion may often favor the prosecution more than the defense; where the video records the accused (as in *Jordan*) rather than the victim (as in the Rodney King video), perceptions of intent are generally inculpatory. The accused who opposes slow motion may also be at a strategic disadvantage; as the defense disputing the events captured (or not captured) in the video can give the prosecution an argument that slow-motion replay should be allowed for rebuttal. *See Commonwealth v. Levengood*, No. 1365 MDA 2017, 2018 WL 1599803, at \*5 (Pa. Super. Ct. Apr. 3, 2018) (holding that trial court did not abuse its discretion in allowing slow-motion replay where defendant on trial for assault raised the issue of self-defense and where there was conflicting testimony about whether complaining witness “took a swing” at defendant or was only swatting aside the flashlight defendant was pointing in his face); *cf.* *United States v. Plato*, 629 F.3d 646, 652 n.3 (7th Cir. 2010) (noting that jury’s request during deliberations to see slow-motion replay of surveillance video may have been “ironically” precipitated by defense’s argument in closing that the video did not show the accused speaking to the informant or participating in drug deal).

157. *See* Bailey & Arkin, *supra* note 12 (describing the Ray Tensing shooting, and how slow-motion playback of the video belied officer Tensing’s claim that he was being dragged by Samuel DuBose’s car, which Tensing argued justified the use of lethal force).

158. *Compare* *Commonwealth v. Cash*, 137 A.3d 1262, 1277 (Pa. 2016) (noting that the fact appellant fired two shots at the victim was only readily ascertainable when viewing the video in slow motion), *with* *Commonwealth v. Jordan*, 65 A.3d 318, 331 (Pa. 2013) (noting that, in the two seconds after Jordan noticed the officer, Jordan took two steps toward the officer before shooting him).

159. *See* *Jones v. Fisher*, Civil Action No. 11-6705, 2014 WL 535182, at \*12 (E.D. Pa. Feb. 10, 2014) (allowing prosecutor’s use, over defense’s objection, of slow-motion playback to rebut the defense’s claims that the gun went off accidentally when banged on a counter; the defense argued that in regular speed playback, “you could see the shooter ‘jump,’” indicating he was as “shocked as anyone else”).

160. Caruso et al., *supra* note 143, at 9252 (finding in Study 4 that groups of people shown

colleagues did note that further study is needed to determine what effects the exact speed,<sup>161</sup> sequence, and number of replays have on the bias.<sup>162</sup> It also bears noting that as of this writing this series of studies was the only one of its kind, and that no other researchers have published attempts to reproduce these studies or performed similar studies with other videos to confirm that the effect is generalizable.

#### F. Replay Effects?

Strangely, little empirical study has been done regarding the effects of repeated viewing of video evidence. Some researchers have reasoned that the “confirmation bias” (the tendency to seek out evidence confirming initial impressions or pre-existing beliefs and to discount contrary evidence) may cause repeat viewings to entrench viewers’ biased impressions.<sup>163</sup> Lassiter has suggested that a somewhat analogous phenomenon, “expectancy effects,” may affect the perception of confession video,<sup>164</sup> although whether the expectation of finding evidence in accord with an initial evaluation of a confession video would cause subsequent viewings to intensify a biased initial evaluation is another question.

Also potentially relevant is the demonstrated causal relationship between visual attention and the camera perspective bias. Using eye-tracking technology, researchers of the camera perspective bias found that viewers (of equal-focus confession video) prompted to visually attend to the confessing suspect ultimately perceived the confession as more voluntary.<sup>165</sup> In suspect-focus confession video,

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both versions of the video from the first study were less likely to find the shooter acted with intent than people who only saw the slow-motion video, but they were still more likely to convict than people who only saw it at regular speed). Performing another jury simulation, they found that the “odds of a unanimous first-degree murder verdict were 3.42-fold higher among juries who saw only the slow version, and 1.55-fold higher among juries who saw both versions.” *Id.*

161. The researchers noted that “at a certain point of ‘superslow motion,’ actors may appear to be moving at nonhumanly slow speeds and seem less likely to possess any mental states, including intentions.” *Id.* at 9253. Film scholars have also noted this surrealistic quality of very slow-motion video. *See, e.g.,* Rogers, *supra* note 141, at 154 (noting that people shown high frame rate footage of a golf ball in “super slow mo” often doubt its authenticity due to the ball’s oddly elastic deformation).

162. Caruso et al., *supra* note 143, at 9253.

163. *E.g.,* Roseanna Sommers, *Will Putting Cameras on Police Reduce Polarization*, 125 *YALE L.J.* 1304, 1348 (2016) (reasoning that if certain dispositional biases are a function of biased memory recall, then repeat viewings could be a corrective, but noting also that the confirmation bias may not only prevent subsequent viewings from correcting the bias, but may in fact exacerbate it).

164. *See* Lassiter, *Sound Public Policy*, *supra* note 54, at 773 (describing research showing that viewers’ expectations influence their evaluations of human behavior in videos containing inconclusive evidence and that confession videos are likely to be less than conclusive). For more information on expectancy effects, see generally G. Daniel Lassiter, Matthew J. Lindberg, Jennifer J. Ratcliff, Lezlee J. Ware & Andrew L. Geers, *Top-Down Influences on Perception of Ongoing Behavior*, in *SOCIAL PSYCHOLOGY OF VISUAL PERCEPTION* 225, 237 (2010).

165. *See* Ware et al., *supra* note 54, at 197.

more visual attention is naturally paid to the suspect (and the bias is generally more intense),<sup>166</sup> but whether multiple viewings of the same suspect-focus confession video would continue to amplify the bias or whether the effects of increased visual attention plateau after the first viewing remains to be studied.<sup>167</sup>

It is also possible that multiple or extended viewings of slow-motion video may compound the effects of the intentionality bias or offset the mitigating influence of full-speed playback. A recent study in the United Kingdom revealed that viewing videos of human movements (such as running and walking) in slow motion for thirty seconds caused participants to perceive subsequently viewed video clips played at regular speed as unnaturally fast, such that the videos had to be slowed down again to appear normal.<sup>168</sup> The researchers attributed this effect to a process of continuous adaptation to visual stimuli.<sup>169</sup> If viewers’ perceptions adjust such that slow motion appears normal to them after extended viewing, then it is possible that viewers’ perceptions of the amount of time that subjects in video had to act and their evaluations of how intentional the subject’s actions were would also intensify with repeat viewings.

Conversely, some have suggested that repeat viewing may sometimes be necessary to correct an initially biased impression. Lassiter once did a study of “judgment perseverance”—the tendency for people to maintain their initial judgments, even after the evidence on which they were based was later discredited<sup>170</sup>—finding that, despite the “initial assumption of guilt being completely discredited,” viewers were still prone to vote for conviction; only when presented with discrediting information while also being shown the video a second time did their judgments change.<sup>171</sup>

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166. *Id.* at 195–96.

167. As visual attention also appears to influence the intensity of some kinds of dispositional biases, *see* Granot et al., *supra* note 101, at 2197, 2206 (finding that increased visual attention on members of perceived outgroups increased the effect of social group commitments on judgments and led to more harsh punishment of outgroup members), the relationship between repeat viewings and attention may be quite important if such biases are to be mitigated, as the number of times and the conditions in which a jury is allowed to watch a video during trial and deliberations are largely within the discretion and control of a trial judge. *See infra* Part III.

168. George Mather, Rebecca J. Sharman & Todd Parsons, *Visual Adaptation Alters the Apparent Speed of Real-World Actions*, SCI. REP., July 27, 2017, at 1–2, <https://www.nature.com/articles/s41598-017-06841-5> [<https://perma.cc/Z57N-LACT>].

169. *Id.* at 6–7 (noting that the effect was present even in videos of scrambled images, but was more pronounced with videos of human figures and recognizable motions, suggesting the perceived speed of motion is influenced by norms of what particular types of motion should look like). The researchers further noted that this phenomenon could partially explain why drivers underestimate their speed when moving from a high-speed zone to a low-speed one; the process of visual adaptation makes high speed seem normal. *Id.* at 7.

170. *See* Lassiter, *Sound Public Policy*, *supra* note 54, at 773 (reasoning, based on prior research, that because the prosecution presents evidence first, a juror may “encode the information contained in the [confession] video in a manner that is consistent with the prosecution’s argument that the defendant is guilty”).

171. *Id.* This study was presented at a psychological conference but remains unpublished. The exact methods used are unclear. *See also* Granot et al., *supra* note 102, at 101–02.

Ultimately, the questions of whether and when repeated viewings of video evidence mitigate or exacerbate video evidence biases have received little empirical analysis. This is unfortunate, as the question of how many times a jury should be allowed to watch video evidence is one of considerable practical importance for practitioners, as is discussed further in Part III.

## II. THE LIMITATIONS OF TECHNOLOGY

Before considering the questions of how prejudicial biases such as these are to the interests of justice and whether or not legislative or judicial action is necessary or feasible, some may wonder how many problems created by such biases will sort themselves out as technology improves. Unfortunately, practical or financial constraints may preclude many technological measures that might mitigate some of these biases, while technology may be ill-suited for addressing other biases at all.

Technological improvement in the context of video evidence has generally meant more<sup>172</sup> or better cameras,<sup>173</sup> which are considered better (by their purveyors and users) by virtue of capturing more information (e.g., higher framerates, resolution, field of view).<sup>174</sup> It is true that practical and financial constraints force law enforcement professionals to carefully consider camera placement and use,<sup>175</sup> and that some technological advances help maximize efficiency of resources,<sup>176</sup> but the

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172. See *supra* note 20 (noting the increased number of cameras in Chicago's surveillance network).

173. Some advances are technically developments of software rather than of cameras themselves. See *infra* note 176.

174. See, e.g., *Why You Shouldn't Purchase the Newest Surveillance Cameras—Yet*, J & M SECURITY SOLUTIONS (Apr. 27, 2017), <http://www.jandmsecuritysolutions.com/problems-newest-surveillance-cameras> [<https://perma.cc/Z2WU-JGT2>] (briefly explaining the development of surveillance camera technology, such as improvements in resolution and field of view, and some drawbacks, such as the increased file size of high-resolution video and associated storage costs); see also LA VIGNE ET AL., *Public Surveillance Systems*, *supra* note 128, at 19–20 (explaining that automated or remotely controlled “pan, tilt, zoom” (PTZ) cameras can rotate and zoom to allow recording from more angles).

175. See LA VIGNE ET AL., *Public Surveillance Systems*, *supra* note 128, at 31–33 (explaining strategies for placing cameras in places most likely to capture crimes). Because video recorded at higher resolutions takes up more digital space, law enforcement also must balance image quality against storage costs, both for closed-circuit television (CCTV) systems, *id.* at 54, and for BWCs, see Jason Kotowski, *Money, Storage Primary Obstacles in Police Body Camera Implementation*, *Public Safety & Homeland Security*, EMERGENCY MGMT. (Mar. 8, 2016), <http://www.govtech.com/em/safety/Police-Body-Cam-Installation.html> [<https://perma.cc/CU6D-VX74>] (noting that digital storage is a large part of the operating cost of BWCs and that this cost informs decisions about the resolution used for recording). Developments in compression may reduce operating costs for cameras somewhat or may enable the capture of high-resolution images.

176. Many advances here involve software rather than cameras per se. For example, when personnel limitations preclude having a live operator watch surveillance footage in real time (“active surveillance”), PTZ cameras can be set to move automatically in “camera tours,” which can increase the chance of a camera capturing some evidence of a crime. See LA VIGNE ET AL., *supra* note 128, at 6, 19–20; see also *id.* at 30 (describing facial and license plate recognition software). Improvements in digital video compression algorithms can also enable

aim of such advances is still to address problems stemming from a lack of visual information about a suspect or a civilian encounter.<sup>177</sup>

As such, biases resulting from a deficit (or perceived deficit) of available information, like the so-called “CSI Effect,”<sup>178</sup> may well be mitigated somewhat as better-designed surveillance cameras provide sharper, clearer video in more cases, and better BWCs prevent some failures to record violent police encounters.<sup>179</sup> Similarly, improvements in design might address some artifacts created by BWCs, such as “deceptive intensity,”<sup>180</sup> or the lack of context created by their field of view in up close shots.<sup>181</sup> Although financial, practical, or legal costs may preclude some of these improvements in practice.<sup>182</sup>

Psychological research of the kind in the previous Part can show us that there may be additional unseen costs to adding visual information.<sup>183</sup> When the visual

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more video of the same general quality to be stored in the same amount of digital space. Nat’l Inst. of Justice, Nat’l Inst. of Standards & Tech. & Fed. Bureau of Investigation, *Operating Characteristics and Functionality Descriptions of Body Worn Cameras*, Exhibit in *Research on Body-Worn Cameras and Law Enforcement*, NAT’L INST. JUST. (Dec. 5, 2017), <https://www.nij.gov/topics/law-enforcement/exhibits/Pages/body-worn-camera-operating-characteristics.aspx> [<https://perma.cc/V38K-QJ2U>] (describing the H.265 compression standard).

177. See LA VIGNE ET AL., *Public Surveillance Systems*, *supra* note 128, at 5, 37, 50 (noting that many investigators recommend “active surveillance” over automated “camera tours” because touring cameras often capture only part of the crime in progress, requiring attorneys to “resort to circumstantial evidence . . . to piece together a story for the court,” and that low visibility due to poor image quality, inclement weather, and poor lighting can also “seriously limit the usefulness of video footage in a trial”).

178. See *supra* Section I.D.

179. Some have suggested BWCs should have an “automated trigger” to start recording in response to raised voices or certain types of movement, so as to prevent officers from turning off their cameras before violent encounters with civilians. See STANLEY, *supra* note 138, at 4. While suggested as a nondiscretionary measure to prevent police abuse, such a feature (with or without the option for officers to manually override it and switch the camera off) could possibly prevent accidental failures to record as well.

180. For example, the exaggerated sense of action created by the BWC’s shaking when the officer moves, see *supra* notes 108–111 and accompanying text, might be mitigated by some form of “Optical Image Stabilization.” This technology uses gyro sensors to quickly shift pieces of the camera lens to compensate for sudden movements. FABRIZIO LA ROSA, MARIA CELVISIA VIRZÌ, FILIPPO BONACCORSO & MARCO BRANCIFORTE, STMICROELECTRONICS, OPTICAL IMAGE STABILIZATION (OIS) 10–11 (2015), [www.st.com/resource/en/white\\_paper/ois\\_white\\_paper.pdf](http://www.st.com/resource/en/white_paper/ois_white_paper.pdf) [<https://perma.cc/B6PW-MGBD>]. However, at present the technology is expensive, *id.* at 4, which may make such efforts cost prohibitive.

181. This lack of context, see *supra* notes 108–111 and accompanying text, might be mitigated somewhat by BWCs with wider-angle lenses. See Boivin et al., *supra* note 113, at 137 (noting that some BWCs are marketed as having a wider field of view, capturing more peripheral information).

182. Inferences based on the absence of video might be nearly eliminated if enough cameras were recording in enough places at high enough resolution at all times. But resource constraints aside, there are serious privacy interests at stake here, and for BWCs, valid law enforcement interests are sometimes served by turning them off. See *supra* note 138.

183. For example, while a wide-angle lens may capture more information close up, such

information added contains no legally relevant facts, collecting it wastes public resources. But when the additional extraneous detail (“noise”)<sup>184</sup> is indistinguishable from meaningful information (“signal”),<sup>185</sup> collecting it can do more than waste resources—it can contaminate the evidence we give to finders of fact and raise the odds of errors which cannot be measured in financial terms.

Technological measures designed only to maximize the visual information available may be simply ill-equipped to solve problems created by an excess of such information in the first place. Present research suggests that camera perspective bias is generally improved only by subtracting visual information, not adding it.<sup>186</sup> Adding a second camera and video from another angle notably failed to correct the demonstrated problems in accuracy presented by the camera perspective bias.<sup>187</sup>

This is not an argument against cameras. There are some crimes that could not be prosecuted without them.<sup>188</sup> Researchers of the camera perspective bias themselves are careful to point out that the bias should not be taken as an argument against the adoption of policies mandating recorded interrogations.<sup>189</sup> Recording interrogations has many benefits, and it may well be that most accused are better off with a recording than without one, bias notwithstanding.<sup>190</sup>

But even if existing camera technology has been a net good, this does not mean that adding additional cameras will always justify the costs. Research of the psychological mechanisms governing our perception of visual evidence warrants further attention by policymakers (and developers of camera technology), as it can help expose unnecessary costs (both financial and otherwise).<sup>191</sup> But while it may be

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“fisheye” lenses may distort perceptions of distance. Boivin et al., *supra* note 113, at 137, 139.

184. *See supra* notes 1–4 and accompanying text.

185. *See supra* notes 1–4 and accompanying text.

186. Not visual information anyway; one study did show that newer, more explicit jury instructions showed some positive effect, though more research is needed to explain how such instructions worked, and such instructions may have practical problems as well. *See supra* note 72.

187. *See supra* note 86 and accompanying text.

188. *See, e.g.*, Morrow et al., *supra* note 135, at 308 (noting research showing that BWCs have increased prosecution in cases of domestic violence).

189. *See, e.g.*, Lassiter, *Sound Public Policy*, *supra* note 54, at 771 (“To avoid the camera perspective bias and the poorer accuracy that appears to be associated with suspect-focus videos, is it necessary to throw out the recording reform with the bathwater? The answer is by all means, no.”).

190. *See* Saul M. Kassin, Jeff Kukucka, Victoria Z. Lawson & John DeCarlo, *Police Reports of Mock Suspect Interrogations: A Test of Accuracy and Perception*, 41 *LAW & HUMAN BEHAV.* 230, 231 (2017) (summarizing many benefits of recorded interrogations for the accused in deterring or detecting coercive interrogation tactics, and for investigators in shielding them from false accusations of coercion and obviating the need for them to take detailed notes).

191. *See* Hillstrom et al., *supra* note 25, at iii, 10–12 (summarizing cognitive research finding that color images did not make investigators more accurate in identifying suspects’ faces from CCTV images, and suggesting that jurisdictions record in black and white where the additional storage space required for color comes at the expense of compression which introduces visual noise, or reduces resolution or framerate, which may reduce the accuracy of identifications).

possible to avoid creating some forms of “noisy” evidence at the source, the ultimate responsibility for filtering out distracting or confusing evidence still rests with the courts.

### III. THE NEED FOR JUDICIAL SCRUTINY

Much remains unknown about the precise costs of situational video biases or what could be done, practically or politically, to solve them. Some of the biases addressed in Part I may turn out not to be problematic. For example, some “CSI Effects” may not exist at all, and while some research suggests that jurors make adverse inferences from the absence of BWC video,<sup>192</sup> the resulting prejudice from such inferences is not necessarily unfair.<sup>193</sup> By contrast, there is no reason whatsoever to doubt that the camera perspective bias exists,<sup>194</sup> and there is evidence from studies that, if representative of real-world conditions,<sup>195</sup> shows that the bias is unquestionably problematic. But even here, there is still uncertainty about whether the proposed solution (equal-focus video) would create problems of its own.<sup>196</sup>

Most of the biases addressed in Part I are not sufficiently well understood to justify any sweeping legislative reforms. For some types of noise-prone video evidence, the situational factors contributing to the bias may be so complex that we can never dispense with fact-specific inquiry. A *per se* rule against slow-motion video, for example, would almost certainly be unjustified, as there are times when slow motion can reveal legally critical facts.<sup>197</sup> But empirical research can still provide useful information to help courts develop better heuristics for balancing

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192. See Morrow et al., *supra* note 135, at 317–18.

193. See NO TAPE, NO TESTIMONY, *supra* note 136, at 12–13 (arguing for jury instructions authorizing adverse inferences against police officers where a jury finds that a failure to record a police-civilian encounter was unreasonable or in bad faith).

194. See *supra* Section I.A (describing the over two decades of research in multiple countries showing the predictable influence of camera perspective on viewer perceptions of confession videos).

195. See *supra* notes 88–92 and accompanying text (discussing some possible methodological limitations).

196. In particular, some research has suggested that “racial salience” may preclude suspects in perceived minority groups from receiving the benefits of equal-focus recording. See *supra* notes 94–101 and accompanying text. Further research may show that such minority suspects are no worse off than they would otherwise be under suspect-focus recording and that equal-focus is still a net improvement, but a solution that differentially benefits defendants by race does, at the very least, introduce some of the philosophical problems that dispositional biases often do.

197. Jeremy Stahl, *New Body Cam Videos Show Cops Coalescing Around False Narrative of Sam DuBose Killing*, SLATE (July 30, 2015, 8:54 PM), [http://www.slate.com/blogs/the\\_slatest/2015/07/30/sam\\_dubose\\_murder\\_phillip\\_kidd\\_and\\_david\\_lindenschmidt\\_suspended\\_after\\_backing.html](http://www.slate.com/blogs/the_slatest/2015/07/30/sam_dubose_murder_phillip_kidd_and_david_lindenschmidt_suspended_after_backing.html) [<https://perma.cc/AL6N-3BC7>] (last updated July 31, 2015, 5:00 PM) (explaining that slow-motion video showed that Officer Tensing was not actually dragged by DuBose’s car; the action which Tensing had claimed justified the panicked reaction to shoot DuBose).

probative value and unfair prejudice.<sup>198</sup> In time, and with strong enough evidence, the codification of some of these heuristics may be justified.<sup>199</sup> For states, the judicial promulgation of evidence rules may also be a more politically feasible way of instituting such changes, particularly for those rules which are counterintuitive or polarizing.<sup>200</sup>

But while research can help judges exercise their discretion in excluding biased video evidence, the responsibility for doing so must rest with the judges themselves. As others have argued, video evidence fails to receive enough judicial scrutiny, in large part because of the misperception (or legal fiction) that video is an objective and reliable medium depicting reality.<sup>201</sup> Contributing to the lack of scrutiny video evidence receives is the incoherent doctrinal basis under which video evidence is admitted, which has received criticism for subjecting certain kinds of video to more scrutiny than others without a coherent reason for doing so.<sup>202</sup> Today, most video

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198. Given the research about the slow-motion intentionality bias, however, slow motion may actually create a special risk of legally unfair prejudice in police use-of-force cases. If slow-motion playback gave viewers the impression that the officer had more time to think and react than they actually did, this could be problematic given that the amount of time the officer had to react is an important factor in assessing the reasonableness of police use of force. *See Graham v. Connor*, 490 U.S. 386, 396–97 (1989); *see also* Stahl, *supra* note 197 (interviewing an Ohio police officer defending Tensing: “People who watch an encounter on video using the slow motion setting to determine what happened have a luxury that police on the street don’t. . . . We make split second decisions. Some are right, some are wrong, but [sic] all of our decisions are made with an eye toward protecting the public and ourselves.”). Tensing’s was likely a special case because there was a specific question of fact that slow motion might show, and that fact (whether he was dragged) was extremely probative under the circumstances.

199. Perhaps, with enough additional studies confirming the generalizability of the prejudicial effects resulting from slow-motion video, it may be appropriate to consider the adoption of a rebuttable presumption against its use, waivable either by stipulation of both parties or only the defendant. *See, e.g.*, FED. R. EVID. 410.

200. *See, e.g.*, Order Amending Rules of Evidence, No. 94S00-0901-MS-4, 2009 BL 223000, at \*12–17 (Ind. Sept. 15, 2009), [https://www.in.gov/ilea/files/Evidence\\_Rule\\_617.pdf](https://www.in.gov/ilea/files/Evidence_Rule_617.pdf) [<https://perma.cc/9V8D-8DFD>] (adopting Indiana Rule 617, which excludes evidence of custodial interrogations which were not fully recorded (subject to several exceptions), and noting that several other states had established similar rules through legislation, court decisions, or evidence rules). Some may resist the adoption of such rules as manifesting an unwarranted distrust of police. *See id.* at \*17 (Shepard, C.J., dissenting).

201. *See* Benforado, *supra* note 6, at 1371 (describing the “key danger with respect to the videotape: it lets judges and jurors off the hook”); Jennifer L. Mnookin, *The Image of Truth: Photographic Evidence and the Power of Analogy*, 10 YALE J.L. & HUMAN. 1 (1998); Andrea Roth, *Machine Testimony*, 126 YALE L.J. 1972, 1977–78, 2006 (2017) (categorizing video and photographic evidence as types of credibility-dependent “machine testimony” subject to “black box dangers”—hidden errors or ambiguities causing fact finders to draw erroneous conclusions); Jessica M. Silbey, *Judges as Film Critics: New Approaches to Filmic Evidence*, 37 U. MICH. J.L. REFORM 493, 507–08 (2004) (referring to confessions and other “actual crime” videos as “*evidence verité*”: a category of evidence misperceived as “unmediated and unselfconscious film footage of actual events,” and portrayed by courts as “*per se* credible and evenhanded”).

202. *See, e.g.*, Roth, *supra* note 201, at 1014; Silbey, *supra* note 201, at 496, 521–22, 556 n.250.

from surveillance and other unmanned cameras is admitted under the “silent witness theory,” according to which the video, once authenticated, “speaks for itself” and is considered substantive evidence not dependent on the credibility of its maker.<sup>203</sup> Apart from videos that contain graphic or emotionally charged content,<sup>204</sup> the content of video evidence is generally scrutinized only on grounds that can be traced to deliberate manipulation.<sup>205</sup>

A similar lack of scrutiny can be seen in decisions regarding the use of video evidence by juries during deliberations. Under the theory that a jury might place “undue emphasis” on some testimony over others, several jurisdictions have found reversible error where certain kinds of “testimonial” video are sent into the jury room for unsupervised viewing during deliberations.<sup>206</sup> Other jurisdictions have adopted rules requiring all “testimonial” video viewed during deliberations to be done in open court under supervision.<sup>207</sup> Exactly what kinds of video count as “testimonial” varies by jurisdiction; the category sometimes includes pretrial statements and depositions, while custodial confessions—despite being “obviously testimonial in nature”—are generally exempt from mandated supervision and are allowed into the jury room during deliberations.<sup>208</sup> This exception<sup>209</sup> is most often justified under the theory that the “centrality” of confessions “warrants whatever emphasis” jurors may put upon them.<sup>210</sup> Videos depicting arrests, or crimes in progress, are similarly considered to

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203. See Roth, *supra* note 201, at 2009; Jessica Silbey, *Cross-Examining Film*, 8 U. MD. L.J. RACE, RELIGION, GENDER & CLASS 17, 25 (2008).

204. See Silbey, *supra* note 201, at 496 (noting that the most common form of judicial scrutiny for filmic evidence is a weighing of unfair prejudice of emotional or graphic content under Federal Rule of Evidence 403).

205. See Silbey, *supra* note 201, at 520–21 (noting that “day-in-the-life” films in civil cases will sometimes be held inadmissible as “evincing too much ‘showmanship’”).

206. Many of these cases involve recorded statements of children alleging sexual assault. See, e.g., *United States v. Binder*, 769 F.2d 595, 600–01 & n.1 (9th Cir. 1985) (finding that the recorded statement of a child accusing the defendant of sexual molestation was “the functional equivalent” of live witness testimony, and sending it in to the jury room during deliberations was an abuse of discretion), *rev’d in part on other grounds*, *United States v. Morales*, 108 F.3d 1031, 1035 n.1 (9th Cir. 1997); *People v. Jefferson*, 393 P.3d 493, 502 (Colo. 2017).

207. See *State v. Gould*, 695 A.2d 1022, 1031 (Conn. 1997); *Young v. State*, 645 So. 2d 965, 96 (Fla. 1994); *State v. Burr*, 948 A.2d 627, 636 (N.J. 2008); *State v. Koontz*, 41 P.3d 475, 479 (Wash. 2002); *Chambers v. State*, 726 P.2d 1269, 1276–77 (Wyo. 1986).

208. *McAtee v. Commonwealth*, 413 S.W.3d 608, 624 & n.11 (Ky. 2013) (collecting authority and noting that the majority of states permit recorded confessions to go into the jury room despite being “obviously testimonial in nature”); MCCORMICK ON EVIDENCE § 220 (Kenneth S. Broun ed., 7th ed. 2014) (noting also that confessions are “obviously testimonial”).

209. Some courts actually do not consider this an exception at all, but rather consider recorded confessions to be “tangible exhibits” and “non-testimonial in character.” *E.g.*, *State v. Monroe*, 766 A.2d 734, 736 (N.H. 2001) (emphasis omitted).

210. MCCORMICK ON EVIDENCE § 220, *supra* note 208; see also *People v. Gingles*, 350 P.3d 968, 971 (Colo. App. 2014) (quoting *Flonnory v. State*, 893 A.2d 507, 528–29 (Del. 2006)) (noting that while the concern that jurors might give testimonial exhibits reviewed during deliberations undue weight over live witness testimony might arguably apply to confessions as well, the “centrality” of confessions to the state’s case justifies their use during

be such reliable depictions of what happened that they raise no concerns of undue emphasis.<sup>211</sup>

Some states subject video depicting testimony, but not video of “actual crimes” or confessions, to mandated supervision under the theory that the first, but not the other two, can lie.<sup>212</sup> This theory overlooks the fact that even if everyone involved acted in good faith, any number of completely unintentional effects (such as camera angle, the different races of the people in the frame, or angle of lens) and some possibly intentional ones (such as the playback speed)<sup>213</sup> can shape jurors’ perceptions in ways they are themselves unaware.

Video evidence is here to stay. As more cities build networks of surveillance cameras, more confessions are recorded, more police departments adopt body-camera programs, and more citizens record interactions with police on their cellphones, more arrests, alleged crimes, interactions with police, and confessions will be recorded. It is difficult to know how much of this video footage finds its way into courtrooms—another subject about which there is surprisingly little data.<sup>214</sup> While the availability of video evidence may solve many problems, the prevalence of video also creates new problems, and the qualities that make video valuable—its stability as compared with human memory, the camera’s neutrality and lack of personal interest, and perhaps most of all the amount of information captured—can also contribute to a dangerous overreliance on video.

CONCLUSION: WHERE WE SHOULD BE LOOKING; THE PROMISE OF SITUATIONAL  
BIAS RESEARCH AND THE NEED FOR PRAGMATIC INQUIRY

This Note started from the premise that energy should be directed toward researching what are likely to be problems which need solving, and those which we may have the ability to solve. This Conclusion explores in greater detail the factors shared by many video evidence biases which make resolution of them both necessary and feasible, and seeks to identify what may be some particularly fruitful areas of study based on these criteria.

deliberations).

211. *See, e.g.*, *Springfield v. Commonwealth*, 410 S.W.3d 589, 593–94 (Ky. 2013) (finding that the recording of a drug purchase was a nontestimonial exhibit that could be viewed by the jury during deliberations, citing authority from other jurisdictions, and noting the video was a “real life replay[] of the central event in question”); *see also* *Windhom v. State*, 756 S.E.2d 296, 298–99 (Ga. Ct. App. 2014) (finding that surveillance video of a parking lot was “independent and original evidence, in and of itself, and does not depend on the credibility of the maker for its value. It is a true depiction of the event.” (quoting *Matthews v. State*, 572 S.E.2d 719, 721 (Ga. Ct. App. 2002))).

212. *See, e.g.*, *Springfield*, 410 S.W.3d at 593 (contrasting case with unpublished decision made the same day in which Supreme Court of Kentucky held that “a video recording of a witness’s testimony was testimonial in nature and thus viewing in the jury room was impermissible.”); *Matthews*, 572 S.E.2d at 721–22 (explaining that Georgia’s “continuing witness rule” prohibits taking recordings of trial testimony into the jury room but does not apply to videos of ongoing crimes.).

213. *See supra* note 156 (discussing the potential for tactical exploitation of slow motion).

214. *See, e.g.*, *Granot et al.*, *supra* note 102, at 94 (noting the lack of available statistics about the use of video evidence in trials).

To constitute a criminal-justice problem, a bias must not only affect people’s perceptions or interpretations of evidence in a predictable fashion, this effect must compromise some aim of the criminal justice system. While some categories of bias—racial discrimination may be the best example—are clearly impermissible because they conflict with constitutional principles,<sup>215</sup> other biases raise difficult normative questions about what the aims of our criminal justice system should be and how it should work.

For example, it is easy enough to say that a conscious, unapologetic racist with a belief that race should drive punishment decisions should be categorically excluded from jury service.<sup>216</sup> Nor is it much harder to say that steps should be taken to mitigate the influence of implicit racial biases which can work the same unfairly prejudicial effects, even if the intent is absent.<sup>217</sup> But another matter are beliefs which might be prejudicial to defendants but which are associated with mainstream cultural or political ideologies. If research shows, for example, that a predisposition to trust police is worse for defendants, but that such a trust is also correlated with political conservatism, at what point do techniques designed to mitigate the influence of such an attitude stop being a judicious attempt to ensure juror impartiality and start to undermine the principles of democratic representation inherent in the jury system?<sup>218</sup> And, more pragmatically, at what point will a proposed solution be perceived as the latter even when it is intended as the former?

Another problem with combating many dispositional biases is that even if a large majority of academics could come to an agreement that the bias represents a problem in need of attention, the politically-charged subject matter of these biases may frustrate the adoption of solutions anyway. Efforts to combat biases resulting from or associated with identification with police may face particular challenges, because such efforts may be thought to manifest a distrust or lack of support for police, police

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215. *See supra* note 35.

216. Although, actually proving and excluding a juror for cause on the grounds of racial animus is easier said than done. *See, e.g.,* Anna Roberts, *(Re)Forming the Jury: Detection and Disinfection of Implicit Juror Bias*, 44 CONN. L. REV. 827, 845–47 (2012) (surveying the limited circumstances in which Supreme Court precedent requires questioning of potential jurors about racial prejudice and academic criticism about the ineffectiveness of these requirements).

217. Although agreeing what steps should be taken may be considerably more difficult. *See id.* at 848–875 (containing detailed examination of various proposals for using the Implicit Associational Test as a device to screen out or educate jurors with implicit racial biases, and the various challenges each proposal would face). There is also some skepticism about how much courts should try to address implicit racial bias. *See* Gregory Mitchell & Philip E. Tetlock, *Antidiscrimination Law and the Perils of Mindreading*, 67 OHIO ST. L.J. 1023, 1116 (2006) (“The concept of implicit prejudice straddles the is-ought boundary that has traditionally separated facts from values: descriptive scientific claims about how people think from normative moral-political claims about how people should think.”); Amy L. Wax, *Discrimination As Accident*, 74 IND. L.J. 1129, 1130 (1999).

218. *See* Kahan et al., *supra* note 11, at 895 n.169 (noting that while proposing “debiasing” strategies to reduce the influence of cultural factors on the perception of videos with politically charged subject matter, the authors wished to make clear that “cultural cognition can be either a faculty of moral perception or a cognitive bias depending on whether its effect on judgment promotes or frustrates ends that are morally appropriate to the settings and roles we inhabit.”).

and prosecutors exert considerable lobbying power with state legislatures,<sup>219</sup> and many judges, especially elected ones, “may have a direct professional investment in appearing tough on crime.”<sup>220</sup>

Many of the biases examined in Part I are comparatively apolitical and do not implicate the same kinds of philosophical debates.<sup>221</sup> But while perhaps somewhat less interesting for this reason, research about biases in less politically sensitive domains may be more capable of revealing problems that can be solved. To the extent that biases can be shown to compromise the popular aims of avoiding arbitrary punishment and producing accurate verdicts,<sup>222</sup> the desirability of managing them should be comparatively uncontroversial.

In this regard, special emphasis is owed to biases which have been shown to produce objectively inaccurate assessments or perceptions of legally relevant fact. There are studies that, if representative of real-world conditions, show that the camera perspective bias falls into this category.<sup>223</sup> Another category worthy of consideration is the “lottery” bias, which seems improper because it suggests the significant influence of a seemingly random factor.<sup>224</sup> This category would include the slow-motion intentionality effect,<sup>225</sup> racial salience,<sup>226</sup> and at least some instances of the “attention divides” effect.<sup>227</sup> While the bias resulting from such “lottery”

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219. William J. Stuntz, *The Pathological Politics of Criminal Law*, 100 MICH. L. REV. 505, 529 (2001) (noting the power of police and prosecutors in lobbying for changes in substantive criminal law); cf. Karena Rahall, *The Green to Blue Pipeline: Defense Contractors and the Police Industrial Complex*, 36 CARDOZO L. REV. 1785, 1805–06 (2015) (noting that law enforcement organizations and police are lobbied by defense contractors and in turn exert considerable power in lobbying legislatures for the appropriations for military weapons and equipment).

220. Anna Lvovsky, *The Judicial Presumption of Police Expertise*, 130 HARV. L. REV. 1995, 2053 (2017) (noting also that “given the demographics of the judiciary, whose members often originate as prosecutors, many judges may be inclined to expand police authority and embrace officer testimony”).

221. There are exceptions of course. For example, whether and when it is justified for jurors to make adverse inferences from the absence of video when an officer was equipped with a BWC but failed to record is a question about which people can reasonably disagree. See *supra* notes 137–40 and accompanying text. Further, one’s opinion about this issue, like the question of whether to mandate recording of custodial confessions, may have much to do with one’s opinion about the trustworthiness of police. See *supra* note 202.

222. See *supra* notes 32–35 and accompanying text.

223. See *supra* notes 78–86 (discussing evidence showing that suspect-focus camera perspective reduces the objective accuracy of viewer’s perceptions that confessions were correct).

224. See *supra* note 39 and accompanying text.

225. See *supra* Section I.E.

226. As the racial salience effect—wherein harsher judgments attend to confessing defendants of racial minorities when the interrogating detective is of a different race—has been explained as a function of selective attention resulting from visual contrast more than implicit racial bias, see *supra* notes 94–99 and accompanying text, it seems to represent a lottery insofar as it punishes minority defendants who happen to be interviewed by white officers.

227. See Granot et al., *supra* note 101 (describing the “green” team study, in which a sense of identification with randomly assigned groups affected punishment decisions when viewers

effects is not necessarily unfair, as the effect may only seem random,<sup>228</sup> when a factor lacking any explainable, rational connection with a defendant’s guilt has a significant influence on factfinders’ judgments of guilt, that should be troubling.<sup>229</sup>

Efforts to address biases rooted in situational factors may also face less psychological resistance than efforts to address ones rooted in dispositional traits. The fact that some situational biases (such as the camera perspective bias) seem to result from a failure of perception, rather than reason, and seem to affect people almost universally, regardless of disposition, culture, education, and the like,<sup>230</sup> may mean that a juror (or judge) told that they are influenced by such a bias would be less prone to react defensively than someone told that their particular mode of reasoning is flawed, or that they are unusually susceptible to judge people based on race or gender.<sup>231</sup>

Of course, efforts to address situational biases present their own practical problems. For example, what was once the proposed solution for the camera perspective bias, equal focus video, may create or exacerbate racial salience effects.<sup>232</sup> The camera perspective bias also presents another practical challenge in that its effects on the accuracy of viewers’ assessments of the genuineness of a confession may result from the content of video (i.e., the facial expressions and non-verbal communication of the confessor).<sup>233</sup> Perhaps owing to their institutional reliance on demeanor evidence, courts have mostly not responded favorably to the considerable body of psychological research about its limitations as a means of deception detection,<sup>234</sup> so to the extent that efforts to curb the camera perspective

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were prompted to visually attend to out group members).

228. For example, sometimes slow-motion video may increase perceptions of intent because facts probative of intent are readily perceivable only in slow motion. *See supra* notes 156–159 and accompanying text.

229. Here racial salience may be the best example—it would be hard to imagine how an investigating officer and a confessing defendant being different races would ever be diagnostic as to whether the confession was genuine.

230. *See supra* notes 55–62.

231. *Cf.* Katharine T. Bartlett, *Making Good on Good Intentions: The Critical Role of Motivation in Reducing Implicit Workplace Discrimination*, 95 VA. L. REV. 1893, 1966 (2009) (discussing research suggesting that accusations of racial or gender bias can be seen to “impugn a person’s sense of integrity” and generate feelings of anger and shame which will make some people react defensively and dismiss the accuser as being a “complainer” or “hypersensitive”); Roberts, *supra* note 216, at 856 (citing Bartlett, *supra*, at 1966) (noting this research and warning that programs seeking to screen jurors with the Implicit Associational Test could backfire because some jurors may resent being questioned about their racial attitudes and view the party who requested the screening as “playing the race card”).

232. *See supra* Section I.B.

233. *See supra* notes 79–87 and accompanying text.

234. *See* Mark W. Bennett, *Unspringing the Witness Memory and Demeanor Trap: What Every Judge and Juror Needs to Know About Cognitive Psychology and Witness Credibility*, 64 AM. U. L. REV. 1331, 1345–52 (2015) (noting that “few legal principles in contemporary American jurisprudence are more entrenched than the notion that demeanor evidence is important in deciding witness credibility,” and that demeanor evidence is a main justification of the right of Confrontation); Dan Simon, *The Limited Diagnosticity of Criminal Trials*, 64 VAND. L. REV. 143, 174–80 (2011) (summarizing research on limited usefulness of demeanor

bias require limiting the influence of demeanor evidence, such efforts may face resistance.

But research about the influence of situational factors on the quality and perception of video evidence still has the potential of answering questions of practical importance for jurists, prosecutors, and defense attorneys conducting criminal trials, and for law enforcement organizations and municipalities adopting and deploying video technology.

Taking the latter point first, one issue that I would suggest needs attention by researchers is the question of framerate. As more law enforcement organizations equip their officers with BWCs,<sup>235</sup> and as more municipalities install video surveillance systems,<sup>236</sup> one of the major financial considerations that will affect the decisions about whether to acquire cameras<sup>237</sup> and what should be recorded<sup>238</sup> is the continuous cost of storing all the digital video captured. Decisions about recording format—including resolution and framerate—can have significant implications for the cost of video storage<sup>239</sup> but also, potentially, for the quality of the evidence produced.

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evidence in deceit detection, and the potential that “visual cues might amount to a red herring that distracts observers from concentrating on more diagnostic information embedded in the content of the statements and the para-verbal cues emitted by the speaker.”). The belief in the value of demeanor evidence is also a principle justification for appellate courts deferring to finders of fact where matters of credibility are concerned. *See Bennett, supra*, at 1350; *Simon, supra*, at 174. Appellate courts may understandably be concerned about the flood of litigation which could be created if a principle justification for deference was undermined.

235. *See supra* notes 18–19.

236. *See supra* note 20.

237. *See HYLAND, supra* note 18, at 8–9 (noting that a third of surveyed police forces which adopted BWCs reported greater than expected storage costs, and that over three-quarters of the surveyed police forces which did not adopt BWCs cited video storage and disposal costs as a reason for not doing so.). Storage costs are also a reason why many police forces which have acquired BWCs have not fully deployed them. *See id.* at 4–5, 14 app. tbl.1 (noting that twenty percent of surveyed agencies only partially deployed their BWCs, and that insufficient funding and technology challenges, including lack of data storage, were the leading reasons given for not fully using the acquired BWCs).

238. To manage storage costs, agencies may also have a financial incentive to limit the events that officers record so as to avoid capturing unnecessary video. *Cf. id.* at 6 tbl.6 (noting that 84% of agencies with BWCs had written policies governing what events to record, of these 93% requiring that traffic stops be recorded while only around half required that the transportation of offenders be recorded). However, where a recording policy calls for officers to frequently toggle recording on and off, there is always the risk that an officer may forget to record an event or may not have the time to press record before a sudden event begins. In such cases law enforcement may face a different sort of cost, given that a jury which knows that the officer had an unused camera may be less likely to credit the officer’s testimony about, for example, a suspect’s unrecorded confession, than if the officer never had a BWC at all. *See supra* Section I.D.

239. In general terms, increasing the resolution, or size of each individual frame, or the number of frames captured per second will each increase the size of the resulting video file. *See NAT’L INST. JUST., supra* note 176 (showing estimated digital sizes of captured video in different resolutions).

In the case of framerate specifically, some assume that BWCs should not record in framerates lower than those typically used for television (25–30 frames per second (fps)),<sup>240</sup> and it seems that most BWCs are at least capable of recording at this speed.<sup>241</sup> By contrast, surveillance cameras commonly record at lower framerates (such as 10fps).<sup>242</sup> Some research by those in the surveillance industry shows that increased framerate is subject to diminishing marginal returns, with lower framerates capturing almost as much relevant information (at least for surveillance purposes) as “normal” framerates but at significantly less cost.<sup>243</sup> While a choppy, low framerate video may be less aesthetically pleasing than one recorded at “normal” speed, it does not necessarily contain less probative evidence about the underlying events.<sup>244</sup>

Some might object that even if a video at “normal” framerate does not contain any discrete, identifiable facts that a lower frame rate video does not, a video is less “lifelike” and immersive—and possibly less persuasive to a jury—when it looks more like a series of still images played in quick succession than an actual event seen

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240. *Id.* (suggesting that framerates lower than 25 FPS “suffer from increased motion blur” and should be avoided for BWCs.).

241. A study of the design characteristics of sixty-six models of BWC on the market showed that most offered recording speeds of at least 30fps, with several offering higher framerates like 60 or 120fps. *See* VIVIAN HUNG, STEVEN BABIN & JACQUELINE COBERLY, NAT’L INST. JUST., A MARKET SURVEY ON BODY WORN CAMERA TECHNOLOGIES, at 4–17 to 4–26 tbl.2 (2016), <https://www.ncjrs.gov/pdffiles1/nij/grants/250381.pdf> [<https://perma.cc/J3KW-MSE3>]. Although a few models were listed as having a default framerate of 30fps and being capable of recording at higher speeds, *see id.* at 5–159, it was unclear from this survey how many of the models examined were capable of recording at framerates lower than 30fps.

242. John Honovich, *Frame Rate Guide for Video Surveillance*, IPVM (Aug. 7, 2014), <https://ipvm.com/reports/frame-rate-surveillance-guide> [<https://perma.cc/C6SF-MBVZ>] (estimating the industry average at around 10fps).

243. *Id.* (comparing the amount of movement which was discernable across surveillance videos of the same events recorded at 1, 10, and 30fps, concluding that “going from 10fps to 30fps can double the storage costs but only marginally improve details captured”). In one vivid illustration of such diminishing marginal returns, one can see three videos of a man walking down a hallway while turning his head from side to side: “at 1fps only a single clear head shot is captured, but at 10fps you get many more. Finally at 30fps, you may get one or two more, but it is not much of an improvement.” The author also noted that a camera designed and properly configured for low framerate recording will not produce motion blur. *Id.* (“Frame rate does not cause blurring. This is a misconception. The camera’s automatic speed shutter control does.”).

244. Granted, BWCs sometimes capture altercations between civilians and officers where there is frenetic movement, *see, e.g.*, Williams et al., *supra* note 107 (showing several scripted videos of such encounters), and in theory some very fast movements in such an encounter could be imperceptible at lower framerates, but it is unclear how often such information would be important to deciding a case. It is even possible that such quick, fleeting movements are more often random noise that says nothing meaningful about a suspect’s guilt or innocence, and which, if scrutinized by a jury (perhaps repeatedly, perhaps in slow motion) will do more harm than good. *Cf.* TALEB, *supra* note 1, at 126–27 (noting that checking stock prices on a more frequent basis can lead to worse financial decisions because daily updates often reflect random market fluctuations (noise), which tend to cancel out in the long run and say less about the actual value of an investment than long term trends).

first-hand. There are two responses to this. First, given that storage costs may lead to recording policies that result in some encounters going unrecorded,<sup>245</sup> choppy video may be preferable to no video at all. Second, and more importantly, video *is* a series of still images played in quick succession. This is no less true when we double the number of images and show each of them for half as long. Whatever persuasiveness video loses when it is made to look more like what it actually is it arguably never deserved in the first place. And, given the research suggesting that people tend to “overbelieve” video and place more weight in it than it deserves,<sup>246</sup> a visual reminder that what one is watching is only a series of pictures, taken by a camera that may or may not have been pointed in the direction of anything relevant and which, like any other evidence, can be confusing, misleading, and open to multiple interpretations, may actually help.

Obviously, research could show otherwise. A choppy, jerkier video may be more prone to the “deceptive intensity” that Professor Stoughton observed.<sup>247</sup> If framerate was low enough, jurors could speculate about what might have happened between frames, and the perceived ambiguities thus injected into the video could create fodder for each juror’s own prejudices and motivated reasoning to influence their perceptions or conclusions.<sup>248</sup> But even if higher framerates generally reduced the tendency for biased perception of video and the optimal framerate psychologically is *higher* than 30fps, that would be useful information too.

Either way, it seems somewhat unlikely that the optimal framerate—which balances the risk of missing information between frames at the low end and the risk of wasting public resources and capturing extraneous information (noise) at the high end—would just happen to be the one we use for television. Given the potential cost savings which might be realized through lower framerate recording, empirical research about precisely how framerate affects the evidentiary and psychological quality of video can help municipalities and police forces make more informed decisions about how to best use public resources.<sup>249</sup>

Finally, research about situational factors that influence the perception of video evidence can have practical significance for legal practitioners who conduct criminal trials. While this Note describes some video evidence biases, like slow motion, as “lotteries” (in that they represent the influence of random or situational factors), to

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245. See *supra* note 240.

246. See Granot et al., *supra* note 102, at 96–98.

247. See *supra* note 106 and accompanying text.

248. Cf. Sommers, *supra* note 9, at 1313, 1349 (summarizing research of motivated reasoning literature, which “suggests that, in general, stimuli that are more ambiguous provide more room for bias to infuse viewers’ interpretations”).

249. Such a study would seem fairly easy to design as well. Given that lower framerate video can always be created from higher framerate video by removing frames, any number of previous studies could be repeated to see what effects framerate has on the intensity of various biases already observed. And if nothing else, because the control group would watch the video in its original framerate, this would give researchers the chance to test the reproducibility of the original studies, which is important in itself. For a discussion about the need for replication studies to validate social science research, see, for example, Jason M. Chin, *Psychological Science’s Replicability Crisis and What It Means for Science in the Courtroom*, 20 PSYCH. PUB. POL’Y & L. 225 (2014).

the extent that counsel can predictably exploit these effects through adversarial presentation they may be better described as games with an element of skill.

While some could argue that the adversarial process manages the risk of bias by giving both the prosecution and the defense the chance to employ such tactics, there is reason to think the prosecution may enjoy structural advantages which enable it to take greater advantage of some presentation effects. For example, while either the defense or the prosecution may try to use slow motion, insofar as slow motion unfairly suggests that the video subjects behaved intentionally, this will, in the normal course, be more helpful for the prosecution, which more often has the burden of proving intent.<sup>250</sup> It has also been suggested that, because the prosecution always presents its case-in-chief first in the United States, the State’s adversarial presentation of video (through narration, freeze-framing, and other techniques) may bias jurors such that they will continue to interpret the video in a way consistent with the State’s presentation, even upon subsequent viewings.<sup>251</sup>

But, as noted earlier,<sup>252</sup> there is a surprising lack of empirical study about the extent to which an initial biased interpretation of video is affected by subsequent repeat viewings, with some researchers suggesting that replays might intensify bias,<sup>253</sup> and others suggesting that a second viewing may be necessary to correct an initial biased perception.<sup>254</sup> Presumably, either or both could be true in different circumstances. However, knowing something about which circumstances tend to reinforce or alleviate bias could be helpful in making decisions about, say, whether jurors should be allowed to rewatch a video in slow motion if they saw it in slow motion during the presentation of evidence.<sup>255</sup>

Researchers of video evidence have started noting the need to study the effects of adversarial presentation, and the potential efficacy of alternative forms of presentation,<sup>256</sup> which seems like precisely the right line of inquiry. In closing, I

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250. *See supra* note 156.

251. Granot et al., *supra* note 102, at 101. Empirical evidence of such a first mover advantage would go a long way toward countering the argument that equal access to adversarial presentation techniques renders them harmless.

252. *See supra* Section I.F.

253. *See supra* note 163.

254. *See supra* notes 171–72.

255. Other related questions might include: (1) should jurors, if allowed to rewatch video in slow motion during deliberations be required to also watch it at normal speed, which the only study thus far of the slow motion intentionality effect showed had a mitigating influence on the bias, *see supra* note 161 and accompanying text; (2) should jurors who wish to rewatch the same few seconds of a video—for example, the moment where an officer’s foot connects with a plaintiff’s head—be allowed to do so without watching the preceding and following moments for context (*cf.* Payne v. Myers, No. 14-CV-39-GKF-TLW, 2016 WL 3884169, at \*6 (N.D. Okla. Jan. 21, 2016) (granting plaintiff’s motion to show this so-called “Kick Off” video in slow motion, but requiring that jury be shown the entire video rather than “short, repetitive clips of the precise moment of contact”)); and (3) what do the answers to the preceding questions tell us about the wisdom of allowing jurors to take video with them into the jury room to watch unsupervised during deliberations, as some jurisdictions do? *See supra* notes 208–15 and accompanying text.

256. *See* Granot et al., *supra* note 102, at 101 (suggesting that having a neutral third party present video evidence first could potentially neutralize a first mover advantage which might

would add only one additional counterargument to the challenge that such efforts would undermine the adversarial process.

Whatever might be said for the adversarial use of video evidence, it is largely inconsistent with the judicial attitude (underpinning the doctrines under which video evidence is admitted) that video evidence is an objective and reliable representation of actual events.<sup>257</sup> If one starts from the (erroneous) premise that video represents reality itself, then the choice to present video in slow motion should be seen as a deliberate distortion of reality.<sup>258</sup> Conversely, if one accepts that video may be ambiguous, or contain irrelevant and confusing information (noise), or have enough room for interpretation that selective presentation or explanation by counsel is necessary or helpful for a jury's proper understanding, then one should also accept that video, like other evidence, can be misleading, confusing, and sometimes substantially more prejudicial than probative. But the position that video evidence represents "what happened" so reliably that it should be admitted without scrutiny seems entirely at odds with the idea that a jury needs help to understand it. If video evidence really does "speak for itself," then it should not require narration.

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otherwise accrue to the prosecution).

257. *See supra* notes 204–15.

258. *See, e.g.,* Commonwealth v. Cash, 137 A.3d 1262, 1282–83 (Pa. 2016) (Wecht, J., concurring) (“[Slow motion playback] may, in a given case, accentuate images and depictions that, by their very nature, are so disturbing as to impart unfair prejudice that outweighs the video’s probative value. As one Pennsylvania court noted, “[i]n a sense, all slow motion and freeze frame video distorts reality. It distorts it in the same way that magnification of a photograph distorts reality. Such distortion may enhance the jury’s understanding or it may do the opposite.” (quoting Commonwealth v. Hindi, 631 A.2d 1341, 1345 (Pa. Super. Ct. 1993))). Justice Wecht’s short concurrence in *Cash* presents an unusually nuanced and thoughtful view of the slow-motion issue, although, with the benefit of hindsight and the study by Caruso and colleagues, *see supra* Section I.E, one might add that slow-motion video can impart other forms of prejudice apart from emphasizing graphic images.