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## Why Courts Fail to Protect Privacy: Race, Age, Bias, and Technology

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## Why Courts Fail to Protect Privacy: Race, Age, Bias, and Technology

Bernard Chao, Catherine Durso, Ian Farrell & Christopher  
Robertson\*

### ABSTRACT

*The Fourth Amendment protects against unreasonable “searches and seizures,” but in the digital age of stingray devices and IP tracking, what constitutes a search or seizure? The Supreme Court has held that the threshold question depends on and reflects the “reasonable expectations” of ordinary members of the public concerning their own privacy. For example, the police now exploit the “third party” doctrine to access data held by email and cell phone providers, without securing a warrant, on the Supreme Court’s intuition that the public has no expectation of privacy in that information. Is that assumption correct? If judges’ intuitions about privacy do not reflect actual public expectations, it may undermine the legitimacy of the criminal justice system, exacerbate social unrest, and produce unjust outcomes.*

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*Although prior research has shown that the police disproportionately target younger people and minority communities, judges tend to be male, white, educated, affluent, and older than the general population. Their intuitions may thus be systematically different. Even worse, cognitive science suggests that judges may have difficulty putting themselves into the shoes of the searched person or considering the reasonableness of the police tactics from an ex ante perspective, without knowledge about the fruits of the search.*

*With 1,200 respondents, we conducted a large-scale survey experiment to test whether—and if so, why—contemporary Fourth Amendment jurisprudence diverges from the societal norms it purports to protect and reflect. We identify a range of privacy expectations for eighteen different police practices. We use oversampling, reweighting, and randomization to demonstrate that there is disparity between judicial and public expectations and investigate the particular causes. In close cases, these disparities are sufficiently large that the Court may be drawing conclusions that conflict with the views of ordinary citizens. We conclude by suggesting better ways forward, so that social science evidence can replace judicial speculation.*

“[J]udges are apt to confuse their own expectations of privacy with those of the hypothetical reasonable person. . . .”

Justice Samuel Alito<sup>1</sup>

“Although constitutional law is riddled with empirical judgments, this fact seems to be lost on most constitutional law scholars.”

Lee Epstein, Barry Friedman, and Geoffrey R. Stone<sup>2</sup>

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participants of the University of Arizona Quantlaw Conference for their helpful comments. Finally, we would like to thank the Hughes Research and Development Committee at the University of Denver which provided both guidance and funding.

1. United States v. Jones, 565 U.S. 400, 427 (2012) (Alito, J., concurring).

2. Lee Epstein, Barry Friedman & Geoffrey R. Stone, Symposium, *Foreword: Testing the Constitution*, 90 N.Y.U.L. REV. 1001, 1006 (2015).

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## INTRODUCTION

Constitutional law routinely rests “on some sort of empirical assertion.”<sup>3</sup> Yet all too often those assertions are based not on reliable empirical data, but rather on judges’ intuitions and sheer speculations. The Fourth Amendment is a prominent example. The Supreme Court’s threshold definition of “searches and seizures,” to which the Fourth Amendment applies, turns on the “reasonable expectations” of ordinary members of the public. The Supreme Court has, however, developed Fourth Amendment doctrine without drawing on data about

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3. *See id.* at 1009.

the actual beliefs of those people. The Court implicitly instructs the federal and state judiciaries—which together tend to be male, white, educated, affluent, older, and less frequently searched—to speculate about how other Americans actually experience police practices. The result is that contemporary Fourth Amendment jurisprudence diverges substantially from the societal norms it purports to protect and reflect. Such a divergence may undermine the legitimacy of the judiciary and exacerbate social unrest.<sup>4</sup>

This Article fills an important part of the empirical gap in Fourth Amendment jurisprudence. We conducted a robust empirical study of the views of members of the public on “reasonable expectations of privacy” to inform judicial decisions about whether police conduct constitutes a search.<sup>5</sup> Concomitantly, whether police conduct constitutes a seizure turns upon reasonable expectations of privacy, liberty, and autonomy.<sup>6</sup> Therefore, “if one takes the Justices at their word, a sense of how (innocent) U.S. citizens gauge the impact of police investigative techniques on their privacy and autonomy is highly relevant to current Fourth Amendment jurisprudence.”<sup>7</sup>

We recruited a diverse sample of 1,200 individuals to determine their views on various police investigative practices. We presented the respondents with a set of scenarios and asked them whether the police actions violated their reasonable expectations of privacy. These scenarios reflect police tactics that have already been the subject of Supreme Court review as well as emerging tactics that rely upon new technologies. We suspected that results from the former scenarios would show that the Supreme Court’s doctrine does not correspond to the views of ordinary members of the public, while results for the latter could help courts address emerging police tactics.

Our data confirm our suspicions. Both the Supreme Court and lower courts substantially underestimate the extent to which ordinary individuals perceive police practices to infringe upon their expectations of privacy and autonomy. This is especially the case in the scenarios involving the application of the “third party” doctrine to police access to new technology, such as smartphones and the internet.<sup>8</sup> Scenarios that, under the third party doctrine, would not constitute a

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4. See Jeffrey Fagan & Tracey L. Meares, *Punishment, Deterrence and Social Control: The Paradox of Punishment in Minority Communities*, 6 OHIO ST. J. CRIM. L. 173 (2008); Tom R. Tyler & Jonathan Jackson, *Popular Legitimacy and the Exercise of Legal Authority: Motivating Compliance, Cooperation and Engagement*, 20 PSYCHOL. PUB. POL’Y & L. 78 (2014) (discussing the role that institutional legitimacy plays in achieving public compliance with the law).

5. *Katz v. United States*, 389 U.S. 347 (1967) (holding that the warrantless use of a listening device was an unreasonable search under the Fourth Amendment).

6. *United States v. Mendenhall*, 446 U.S. 544, 544 (1980) (describing a seizure as an “intrusion upon that person’s liberty or privacy”).

7. See also Christopher Slobogin & Joseph E. Schumacher, *Reasonable Expectations of Privacy and Autonomy in Fourth Amendment Cases: An Empirical Look at “Understandings Recognized and Permitted by Society,”* 42 DUKE L.J. 727, 732 (1993).

8. The third party doctrine states that there is “no legitimate ‘expectation of privacy’” in “information revealed to a third party and conveyed by him to Government authorities.” *United States*

search or seizure were treated by our survey respondents as more intrusive than those the Court considers the most intrusive and requiring the most stringent justification.<sup>9</sup> We therefore argue that when the Supreme Court is called to rule upon these new investigative techniques, the Court should refuse to apply the third party doctrine. Indeed, the Supreme Court has the opportunity do just that in *Carpenter v. United States*, which is currently pending before the Court.<sup>10</sup> Other cases also involving technology searches similar to the scenarios we tested are sure to follow quickly on *Carpenter*'s heels.<sup>11</sup>

Importantly, our study also examined *why* judicial doctrine diverges from societal views of privacy and autonomy. We applied an innovative experimental design that allowed us to assess whether first person and outcome biases affect people's views of whether police conduct violates their reasonable expectations of privacy and autonomy. We tested for these biases by manipulating the perspective of the survey respondent (whether the respondent was the searched person or an observer) and whether the participants were told that the search revealed incriminating evidence. We also enriched our sample to explore the potential for racialized perceptions of government legitimacy in this sensitive law enforcement domain, a nuance that may not be fully captured by the speculations of a less-diverse judiciary.

We have five primary findings relevant to law and policy. First and most importantly, in general, the U.S. public has greater concerns for privacy than are reflected in current judicial doctrine. Second, current judicial doctrine includes several relative judgments—e.g., giving no protection to emails held by an internet provider, but absolute protection to a bedroom—that do not reflect actual expectations of privacy in the United States. Third, the ubiquitous practice of judgment in hindsight (i.e., with knowledge that a search has found evidence of crime) strongly decreases the likelihood that people will find violations of reasonable expectations or privacy. Fourth, the pervasive practice of developing Fourth Amendment doctrine through criminal defendants' suppression motions (in the third person) also decreases the likelihood of finding a violation. Fifth, whites and older persons (beyond age 41)—such as those who dominate the U.S. state and federal judiciary—are less likely to find that police investigative practices invade privacy.

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v. Miller, 425 U.S. 435, 442–43 (1976); see also Erin Murphy, *The Case Against the Case for Third-Party Doctrine: A Response to Epstein and Kerr*, 24 BERKELEY TECH. L.J. 1239 (2009) (discussing various arguments both for and against the third party doctrine).

9. See *infra* Part V(B) for a comparison of our results to the Supreme Court's holdings.

10. *United States v. Carpenter*, 819 F.3d 880 (6th Cir. 2016), *cert. granted*, 137 S. Ct. 2211 (June 5, 2017) (No. 16-402). The question as presented by the petitioner is “[w]hether the warrantless seizure and search of historical cell phone records revealing the location and movements of a cell phone user over the course of 127 days is permitted by the Fourth Amendment.” Petition for Writ of Certiorari at i, *Carpenter v. United States*, No. 16-402 (U.S. argued Nov. 29, 2017).

11. See, e.g., *United States v. Mohamud*, 843 F.3d 420 (9th Cir. 2016), *cert. denied*, \_\_\_ S. Ct. \_\_\_ (Jan. 8, 2018) (No. 17-5126), 2018 WL 311442 (Mem) (challenging the constitutionality of using information gathered pursuant to the FISA Amendments Act against U.S. citizens).

Our Article proceeds as follows. Part II describes the legal background of reasonable expectations of privacy in Fourth Amendment jurisprudence. Part III argues that the Supreme Court's reasonable expectations of privacy analysis purportedly adopts the first person perspective of an innocent suspect, reflective of ordinary members of the public. This Part then reviews prior empirical studies that suggest problems with the implementation of this doctrine. Part IV describes the methodology of our study, Part V reports our findings, and Part VI describes the study's limitations and our recommendations.

## I.

### LEGAL BACKGROUND

#### A. Reasonableness Under the Fourth Amendment

From the outset, it is crucial to distinguish between the separate roles that different conceptions of "reasonableness" play in Fourth Amendment doctrine. One role comes from the text of the constitutional provision. The Fourth Amendment provided in part that "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated."<sup>12</sup> But what government conduct constitutes a "search" or "seizure"? Only government conduct that is determined to be a search or seizure must not be "unreasonable."

Second, and more fundamentally, the Supreme Court has also defined "searches and seizures"—the threshold question of whether the Fourth Amendment applies—by reference to reasonableness. Government conduct constitutes a search when it violates "reasonable expectations of privacy"<sup>13</sup> and constitutes a seizure when it intrudes upon reasonable expectations of autonomy.<sup>14</sup>

Our study addresses this latter threshold conception of reasonableness underpinning the definition of searches and seizures. As we argue in more detail below, the Supreme Court has repeatedly—and explicitly—asserted that "reasonableness" in this context is determined by the beliefs of the typical innocent member of society who is subjected to the potential search or seizure.<sup>15</sup> The beliefs of such members of society are therefore directly relevant to the legitimacy of the Supreme Court's decisions on whether the Fourth Amendment applies to various forms of police investigation, making this a particularly ripe issue for empirical study.

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12. U.S. CONST. amend. IV.

13. See *United States v. Jones*, 565 U.S. 400, 407 (2012) (quoting *Katz v. United States*, 389 U.S. 347, 360 (1967) (Harlan, J., concurring)) ("[A] violation occurs when government officers violate a person's 'reasonable expectation of privacy.'").

14. See, e.g., Slobogin & Schumacher, *supra* note 7, at 732 ("The Court's seizure cases['] . . . repeated use of the 'reasonable person' rubric suggests a similar reliance on what the average citizen would feel with respect to restraints on freedom of action.").

15. See *infra* Part III(A).



B. *The Definition of Searches and Seizures*

The Supreme Court's interpretation of searches and seizures expanded in the twentieth century. In the early case of *Olmstead v. United States*, the Supreme Court defined government searches solely by reference to violations of property interests, such that wiretapping telephone lines did not constitute a search since the wiretaps "were made without trespass upon any property of the defendants."<sup>16</sup> However, in the seminal case *Katz v. United States*, the Court shifted the focus of its Fourth Amendment analysis from property to privacy. Writing for the Court, Justice Stewart asserted that this was because "the Fourth Amendment protects people, not places."<sup>17</sup> Therefore, "what a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected."<sup>18</sup>

Justice Harlan's concurrence provided an influential framework. Justice Harlan described "a twofold requirement, first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as 'reasonable.'"<sup>19</sup>

The concept of reasonable expectations of privacy has been the foundation of Fourth Amendment analysis in the four decades since *Katz* was decided.<sup>20</sup> While the Court recently resurrected the property conception of a search in *United States v. Jones*, it did so in a manner that supplemented rather than supplanted the privacy conception.<sup>21</sup> That is, *Jones* held that *Katz* had extended, rather than repudiated, the Fourth Amendment protections afforded under the property rubric. Post-*Katz*, a search occurred when government agents intruded upon either property interests or reasonable expectations of privacy.<sup>22</sup>

In *Jones*, government agents installed a GPS tracking device on the undercarriage of a vehicle and tracked the vehicle's movements for twenty-eight days.<sup>23</sup> The Court held that the *installation* of the GPS device on the vehicle was a search because "[t]he Government physically occupied private property for the

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16. *Olmstead v. United States*, 277 U.S. 438, 457 (1928).

17. *Katz v. United States*, 389 U.S. 347, 351 (1967).

18. *Id.* at 351 (internal citations omitted).

19. *Id.* at 361 (Harlan, J., concurring).

20. *See, e.g., California v. Greenwood*, 486 U.S. 35 (1988) (no privacy in trash left on curb for collection); *Oliver v. United States*, 466 U.S. 170 (1984) (no privacy in private property outside the curtilage of a home); *United States v. Jacobsen*, 466 U.S. 109 (1984) (no privacy in contents of a box previously opened by a private party); *United States v. Miller*, 425 U.S. 435 (1976) (no privacy in bank records); *United States v. White*, 401 U.S. 745 (1971) (no privacy in information told to an informant).

21. 565 U.S. 400 (2012).

22. *Id.* at 406 ("[F]or most of our history the Fourth Amendment was understood to embody a particular concern for government trespass upon the areas ('persons, houses, papers, and effects') it enumerates. . . . '[W]e [do not] believe that *Katz*, by holding that the Fourth Amendment protects persons and their private conversations, was intended to withdraw any of the protection which the Amendment extends to the home . . . .") (alterations in original).

23. *Id.* at 403.

purpose of obtaining information.”<sup>24</sup> By basing its conclusion on property intrusion, the Court sidestepped the crucial but complicated question of whether using a GPS device to track the location of a vehicle on public streets for such an extended time period was a violation of reasonable expectations of privacy.<sup>25</sup>

Nevertheless, the concept of a reasonable expectation of privacy remains the touchstone of Fourth Amendment analysis in the wake of *Jones*. The reasonable expectations of privacy analysis will be especially important when courts address techniques for obtaining information using new technologies, as these will rarely involve physical intrusions into constitutionally protected areas.

The Court’s definition of a seizure employs a parallel conception of reasonableness. *United States v. Mendenhall*<sup>26</sup> established that “a person has been ‘seized’ within the meaning of the Fourth Amendment only if, in view of all of the circumstances surrounding the incident, a reasonable person would have believed that he was not free to leave.”<sup>27</sup> The *Mendenhall* Court looked to whether the citizen who is questioned “remains free to disregard the questions and walk away,” and, if he or she is able to do so, then “there has been no intrusion upon that person’s liberty or privacy.”<sup>28</sup> Numerous cases have adopted this reasonableness test for whether police conduct constitutes a seizure.<sup>29</sup> As

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24. *Id.* at 404.

25. The question the Court avoided answering is precisely one of the scenarios we tested in our empirical study. It is also important to note that two of the concurring opinions did address the question of whether GPS tracking of a vehicle for twenty-eight days violated reasonable expectations of privacy, in important but different ways. Justice Alito applied what is described in the literature as “mosaic theory” to argue that surveillance for such an extended use of time constitutes a Fourth Amendment search. *Id.* at 431. *See, e.g.*, Monu Bedi, *Social Networks, Government Surveillance, and the Fourth Amendment Mosaic Theory*, 94 B.U. L. REV. 1809 (2014); David Gray & Danielle Keats Citron, *A Shattered Looking Glass: The Pitfalls and Potential of the Mosaic Theory of Fourth Amendment Privacy*, 14 N.C. J.L. & TECH. 381 (2013); Orin S. Kerr, *The Mosaic Theory of the Fourth Amendment*, 111 MICH. L. REV. 311, 313 (2012); Matthew B. Kugler & Lior Jacob Strahilevitz, *Actual Expectations of Privacy, Fourth Amendment Doctrine, and the Mosaic Theory*, 6 SUP. CT. REV. 205 (2015); Christine S. Scott-Hayward, Henry F. Fradella & Ryan G. Fischer, *Does Privacy Require Secrecy? Societal Expectations of Privacy in the Digital Age*, 43 AM. J. CRIM. L. 19 (2015). In her concurring opinion, Justice Sotomayor agreed with Justice Alito that longer-term GPS monitoring constitutes a Fourth Amendment search. *Jones*, 565 U.S. at 955. But Justice Sotomayor also called into question the constitutionality of “even short-term monitoring,” *id.* at 415, and proposed that “[m]ore fundamentally, it may be necessary to reconsider the premise that an individual has no reasonable expectation of privacy in information voluntarily disclosed to third parties,” *id.* at 417. We address this suggestion in greater detail Part I.C below.

26. 446 U.S. 544 (1980).

27. *Id.* at 554.

28. *Id.* at 554, 546.

29. *See, e.g.*, *Brendlin v. California*, 551 U.S. 249, 255 (2007) (expressly applying *Mendenhall*); *United States v. Drayton*, 536 U.S. 194, 195 (2002) (applying a “reasonable person” standard to determine whether a seizure occurred); *Florida v. Bostick*, 501 U.S. 429, 424 (1991) (same); *California v. Hodari D.*, 499 U.S. 621, 628 (1991) (“*Mendenhall* establishes that the test for existence of a “show of authority” is an objective one . . . .”); *Michigan v. Chesternut*, 486 U.S. 567, 572 (1988) (“[A]ny assessment as to whether police conduct amounts to a seizure . . . must take into account ‘all of the circumstances surrounding the incident . . . .’”) (internal quotation marks omitted); *Florida v. Royer*, 460

other scholars have pointed out, “[w]hile [the seizure cases] do not rely on community values as explicitly as the search cases do, their repeated use of the ‘reasonable person’ rubric suggests a similar reliance on what the average citizen would feel with respect to restraints on freedom of action.”<sup>30</sup> Similarly, the seizure cases’ repeated description of seizures as intrusions on *privacy* demonstrates that the Court considers (or purports to consider) societal beliefs about privacy in both the search and seizure contexts.<sup>31</sup>

### C. The Third Party Doctrine

The Supreme Court has developed a number of doctrinal rules that purportedly derive from reasonable expectations of privacy. One of these rules is the third party doctrine, which states that an individual has no reasonable expectation of privacy in information that has been voluntarily disclosed to any third party.

In *United States v. Miller*,<sup>32</sup> for example, the Court held that individuals do not have a reasonable expectation of privacy in checks, deposit slips, and other documents provided to their bank. These documents contained “only information voluntarily conveyed to the banks and exposed to their employees in the ordinary course of business.”<sup>33</sup> The *Miller* Court based this rule on its understanding of when it is reasonable or legitimate for a person to expect information to remain private. The Court declared that “[t]he depositor takes the risk, in revealing his affairs to another, that the information will be conveyed by that person to the

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U.S. 491, 503 n.9 (1983) (internal citation omitted) (“Our decision here is consistent with the Court’s judgment in *United States v. Mendenhall*.”).

30. Slobogin & Schumacher, *supra* note 7, at 732.

31. See, e.g., *City of Indianapolis v. Edmond*, 531 U.S. 32, 48, 52 (2000) (Rehnquist, C.J., dissenting) (describing roadblock seizures of automobiles as involving “only minimal intrusion on the privacy of their occupants” and stating “[i]t is the objective effect of the State’s actions on the privacy of the individual that animates the Fourth Amendment”); *Michigan Dep’t of State Police v. Sitz*, 496 U.S. 444, 448–49 (1990) (quoting *Sitz v. Department of State Police*, 170 Mich. App. 433, 439 (Mich. Ct. App. 1988)) (stating that the test for whether a sobriety checkpoint was a valid seizure required balancing the state’s interests against “the level of intrusion on an individual’s privacy caused by the checkpoints”); *Florida v. Royer*, 460 U.S. 491, 514–15 (1983) (explaining that determining whether “a seizure less intrusive than a formal arrest” complies with the Fourth Amendment “requires balancing the amount of intrusion upon individual privacy against the special law enforcement interests”); *Michigan v. Summers*, 452 U.S. 692, 697–98 (1981) (quoting *Dunaway v. New York*, 442 U.S. 200, 209 (1979)) (explaining that “the intrusion on the citizen’s privacy” in many special needs seizures “was so much less severe” than that involved in a traditional arrest”); *Mendenhall*, 446 U.S. at 554 (describing a seizure as an “intrusion upon that person’s liberty or privacy”); *Brown v. Texas*, 443 U.S. 47, 51 (1979) (stating that a “central concern [of the Court’s seizure cases] has been to assure that an individual’s reasonable expectation of privacy is not subject to arbitrary invasions”); *Dunaway*, 442 U.S. at 213 (referring to “[t]he central importance of the probable-cause requirement [for arrest] to the protection of a citizen’s privacy”); *Terry v. Ohio*, 392 U.S. 1, 34 (1968) (describing a temporary seizure of Terry as “interrupt[ing] Terry’s freedom of movement and invad[ing] his privacy”).

32. 425 U.S. 435 (1976) (holding that individuals do not possess a reasonable expectation of privacy in information given to a bank).

33. *Id.* at 442.

Government.”<sup>34</sup> This is true “even if the information is revealed on the assumption that it will be used only for a limited purpose and the confidence placed in the third party will not be betrayed.”<sup>35</sup>

The third party doctrine has suffered substantial academic and judicial criticisms, especially in light of the profound extent to which we “voluntarily” convey information to third parties in the digital age. For example, in *United States v. Jones*,<sup>36</sup> Justice Sotomayor’s concurrence called for a wholesale reconsideration of “the premise that an individual has no reasonable expectation of privacy in information voluntarily disclosed to third parties.”<sup>37</sup>

This approach is ill suited to the digital age, in which people reveal a great deal of information about themselves to third parties in the course of carrying out mundane tasks. People disclose the phone numbers that they dial or text to their cellular providers; the URLs that they visit and the e-mail addresses with which they correspond to their Internet service providers; and the books, groceries, and medications they purchase to online retailers . . . I for one doubt that people would accept without complaint the warrantless disclosure to the Government of a list of every Web site they visited in the last week, or month, or year.<sup>38</sup>

Our empirical study gathers data on precisely the questions about which Justice Sotomayor postulated: whether people would consider it reasonable to expect privacy in information provided to internet service providers, cell phone companies, website operators, and so on.

Many of the questions about whether there is a reasonable expectation of privacy in the context of these new technologies remain unresolved by the Supreme Court.<sup>39</sup> The lower courts have also split on whether the collection of historical cell site data, which police can use to approximate a person’s movements over periods of time, violates reasonable expectations of privacy.<sup>40</sup> Arguably, whether individuals have a reasonable expectation of privacy with respect to such technologies is the most important contemporary question in Fourth Amendment jurisprudence.<sup>41</sup> The results of our study will therefore provide a resource for courts and suggest how the Supreme Court *should* resolve

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34. *Id.* at 443.

35. *Id.*

36. 565 U.S. 400 (2012).

37. *Id.* at 417.

38. *Id.* at 417–18.

39. *Id.* at 413 (expressly declining to decide whether GPS tracking violated a reasonable expectation of privacy in one’s movement on public roads).

40. Compare *United States v. Graham*, 824 F.3d 421 (4th Cir. 2016) (holding that obtaining cell site location information is a search requiring probable cause and a warrant), with *United States v. Davis*, 785 F.3d 498 (11th Cir. 2015) and *United States v. Carpenter*, 819 F.3d 880 (6th Cir. 2016) (holding that obtaining cell site location information is not a search requiring probable cause and a warrant).

41. See, e.g., Elizabeth E. Joh, *The New Surveillance Discretion, Automated Suspicion, Big Data, and Policing*, 10 HARV. L. & POL’Y REV. 15, 18 (2016) (“[C]urrent unresolved issues of police technology have focused on whether a particular use is a Fourth Amendment search requiring a warrant and probable cause.”).

these issues when, inevitably, it is called upon to do so. In contrast, earlier studies tested community members' opinions on scenarios on which the Supreme Court had already ruled.<sup>42</sup> Our study is therefore uniquely valuable as a prospective guide for the Supreme Court when it wrestles with these issues in the near future.

#### D. *The Case for Reasonableness as Ordinary Beliefs*

To evaluate a given police practice—whether in the third party context or more generally—we join a longstanding and growing chorus of scholars who call for empirical study of actual contemporary social norms and understandings. A quarter-century ago, Slobogin and Schumacher made a ground-breaking study of public attitudes to government searches.<sup>43</sup> They pointed primarily to *Rakas v. Illinois*<sup>44</sup> as support for the proposition that empirical study could be helpful.<sup>45</sup> In *Rakas*, the Court asserted that “[l]egitimation of expectations of privacy by law must have a source outside of the Fourth Amendment, either by reference to concepts of real or personal property law or to understandings that are recognized and permitted by society.”<sup>46</sup> This language, together with the language in which Justice Harlan stated the second prong of the “search” test in *Katz*, suggests that it is *society’s* beliefs and expectations that determine the scope of privacy protected by the Fourth Amendment.

This conception of reasonable expectations of privacy is supported by a slew of other Supreme Court decisions. For example, the Court held in *Kyllo v. United States* that “obtaining by sense-enhancing technology any information regarding the home’s interior that could not otherwise have been obtained without physical ‘intrusion into a constitutionally protected area’ . . . constitutes a search—at least where (as here) the technology in question is not in general public use.”<sup>47</sup> The Court’s caveat—that government use of technology is not a Fourth Amendment search if the technology is in general public use—only makes sense if the definition of a search is meant to encapsulate actual social beliefs and expectations, shaped by social practices outside the context of police investigations.

The Court took a similar approach in cases addressing whether aerial surveillance of the backyard of a person’s house constitutes a search. In *California v. Ciraolo*,<sup>48</sup> the Court referred to societal expectations to justify its holding that police inspection from a fixed-wing aircraft in navigable airspace did not violate reasonable expectations of privacy.<sup>49</sup> The Court reasoned that it

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42. See *infra* Part II.

43. Slobogin & Schumacher *supra* note 7, at 731 (describing “the Court’s willingness to rely on societal understandings in defining ‘reasonable expectations of privacy’”).

44. 439 U.S. 128 (1978).

45. Slobogin & Schumacher, *supra* note 7, at 731.

46. *Rakas v. Illinois*, 439 U.S. 128, 143 n.12 (1978) (emphasis added).

47. *Kyllo v. United States*, 533 U.S. 27, 28 (2001).

48. 476 U.S. 207 (1986).

49. *Id.* at 214.

was not reasonable to expect privacy in an area that anyone could view by legally flying over it.<sup>50</sup> Given that “[a]ny member of the public flying in this airspace who glanced down could have seen everything that these officers observed,”<sup>51</sup> the Court “readily conclude[d] that respondent’s expectation that his garden was protected from such observation is unreasonable and is not an expectation that society is prepared to honor.”<sup>52</sup> The Court emphasized that the *Katz* test incorporates the actual beliefs and expectations of members of society by asserting that “Justice Harlan made it crystal clear that he was resting on the *reality* that one who enters a telephone booth is entitled to assume that his conversation is not being intercepted.”<sup>53</sup> The Court found no reasonable expectation of privacy “in an age where private and commercial flight in the public airways is routine.”<sup>54</sup>

Three years later in *Florida v. Riley*,<sup>55</sup> the Court applied the same approach to helicopter surveillance from the lower altitude of four hundred feet. The Court asserted that “‘private and commercial flight [by helicopter] in the public airways is routine’ in this country” and pointed out that “helicopters are not bound by the lower limits of the navigable airspace allowed to other aircraft.”<sup>56</sup> Therefore, “[a]ny member of the public could legally have been flying over Riley’s property in a helicopter at the altitude of 400 feet and could have observed Riley’s greenhouse. The police officer did no more.”<sup>57</sup>

The Supreme Court has also purported to rely on actual social norms and understanding when addressing two different aspects of what constitutes a search of a person’s house. The first aspect involves situations in which a person other than the suspect gives the government investigator permission to enter the premises. The second aspect relates to determining whether entry onto a person’s curtilage constitutes a trespass and is therefore a search.

The first aspect is evident in *Georgia v. Randolph*, where the Court surveyed its prior decisions on consent to enter and concluded that:

The constant element in assessing Fourth Amendment reasonableness in the consent cases, then, is the great significance given to *widely*

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50. *Id.*

51. *Id.* at 213–14.

52. *Id.* at 214.

53. *Id.*

54. *Id.* at 215.

55. 488 U.S. 445 (1989).

56. *Id.* at 450–51.

57. *Id.* at 451. We do not offer these examples to endorse the Court’s conclusions about what societal expectations actually are—such as the Court’s bare assertion that “any member of the public” could have been flying a helicopter over the defendant’s backyard, and therefore it is unreasonable to expect privacy in one’s backyard, even when the backyard is shielded from prying eyes at ground level or from nearby structures. *Id.* Indeed, the whole point of our empirical study is to assess quantitatively the accuracy of Court’s assumptions and intuitions about social realities. The point of these examples is to show that the Court is clearly *purporting* to draw on the “reality” of social expectations in determining what counts as reasonable.

*shared social expectations*, which are naturally enough influenced by the law of property, but not controlled by its rules.<sup>58</sup>

The Court continued:

[Our prior decisions] not only hold[] that a solitary co-inhabitant may sometimes consent to a search of shared premises, but stands for the proposition that the reasonableness of such a search is in significant part a function of *commonly held understanding* about the authority that co-inhabitants may exercise in ways that affect each other's interests.<sup>59</sup>

In *Randolph*, the Court applied this approach to a situation in which the suspect has expressly refused permission to enter, but a co-occupant has given permission. Entry in this situation constitutes a search, because:

[A] caller standing at the door of shared premises would have no confidence that one occupant's invitation was a sufficiently good reason to enter when a fellow tenant stood there saying, "stay out." Without some very good reason, *no sensible person* would go inside under those conditions. . . . Unless the people living together fall within some recognized hierarchy, like a household of parent and child or barracks housing military personnel of different grades, *there is no societal understanding* of superior and inferior."<sup>60</sup>

Recently, the Court relied on social norms and widely held understandings in a second way, namely to determine when physical entry onto the curtilage was a Fourth Amendment search. In *Florida v. Jardines*,<sup>61</sup> a police officer took a drug-sniffing dog onto the defendant's front porch, where it explored back and forth and sniffed under the front door. The Supreme Court noted that while the porch was part of the curtilage and therefore constitutionally protected, "[a] license [to enter] may be implied from *the habits of the country*."<sup>62</sup> What is reasonable for a police officer, the Court held, turns on the commonly held understanding of members of society:

Complying with the terms of that traditional invitation does not require fine-grained legal knowledge; it is generally managed without incident by the Nation's Girl Scouts and trick-or-treaters. Thus, a police officer not armed with a warrant may approach a home and knock, precisely because that is "no more than any private citizen might do."<sup>63</sup>

But this license, the Court decided, does not extend to "introducing a trained police dog to explore the area around the home in hopes of discovering incriminating evidence. . . . There is no customary invitation to do *that*. An

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58. 547 U.S. 103, 111 (2006) (emphasis added).

59. *Id.* (emphasis added).

60. *Id.* at 113–14 (emphasis added).

61. 569 U.S. 1 (2013).

62. *Id.* at 8.

63. *Id.* (quoting *Kentucky v. King*, 563 U.S. 452, 469 (2011)).

invitation to engage in canine forensic investigation assuredly does not inhere in the very act of hanging a knocker.”<sup>64</sup>

It is quite instructive for the purposes of our study to note the points of agreement and disagreement between the majority and dissent in *Jardines*. Both Justice Scalia’s majority opinion and Justice Alito’s dissent accepted the importance of widely shared community norms; however, they disagreed about the content of these norms. Justice Scalia wrote:

With this much, the dissent seems to agree—it would inquire into the appearance of things, what is typical for a visitor, what might cause alarm to a resident of the premises, *what is expected of ordinary visitors*, and what would be *expected from a reasonably respectful citizen*. These are good questions. But their answers are incompatible with the dissent’s outcome, which is presumably why the dissent does not even try to argue that it would be customary, usual, reasonable, respectful, ordinary, typical, nonalarming, etc., for a stranger to explore the curtilage of the home with trained drug dogs.<sup>65</sup>

Of course, the majority opinion likewise offered little support for its contrary conclusion. Both justices relied on their intuitions and assumptions about what is customary or usual, and about what a reasonable, respectful, typical person would consider appropriate behavior when approaching a home. Neither Justice Scalia nor Justice Alito made any attempt to refer to some external, objective basis for their assertions about what is reasonable; both placed blind reliance on the notion that they were accurate barometers of the public at large and that their gut instincts were commensurate with those of the general population. It is precisely this void that survey data like ours can fill.

These Supreme Court opinions support the proposition that empirical evidence of whether “contemporary, ordinary Americans expect privacy in a particular context”<sup>66</sup> is relevant to whether government investigators have conducted a search.<sup>67</sup> In an excellent recent article, Matthew Kugler and Lior Strahilevitz described this approach as the most natural reading of the *Katz* reasonable expectations of privacy test: “The most obvious approach would

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64. *Id.* at 9.

65. *Id.* at 8 n.2. (emphasis added) (internal citations and quotation marks omitted).

66. Kugler & Strahilevitz, *supra* note 25, at 220.

67. For an excellent extended discussion of the role of community expectations in deciding whether the government is conducting a search, see BARRY FRIEDMAN, UNWARRANTED: POLICING WITHOUT PERMISSION, at ch. 9 (2017). Friedman casts the *Katz* test specifically in terms of social convention or social norms. He argues that “*Katz* can be read as making social convention determinative of when we have a reasonable expectation of privacy. In other words, one interpretation of the *Katz* decision is that whether the government is conducting a ‘search’ . . . properly rests on societal norms about when we all ought to be able to expect to have our privacy respected.” *Id.* at 225. While we tested individual beliefs rather than social convention, the former presumably inform the latter—and vice versa. As Friedman notes, “[t]echnology is invariably going to shift the way we interact with one another, and what our expectations of appropriate social behavior are. The law must be concerned with how people understand their privacy in the world in which we actually live. And it is to those expectations that law enforcement must adhere.” *Id.* at 226.



be . . . to ask a representative sample of Americans such questions directly.”<sup>68</sup> But there is in fact a serious dispute among both jurists and scholars as to whether it is appropriate to consult survey data in determining the content of people’s reasonable expectations of privacy. The most prominent contrary voice in the academy is that of Orin Kerr, who has argued that courts often resolve *Katz* questions without purporting to reflect what ordinary Americans believe or expect in particular contexts.<sup>69</sup>

Kerr argued that the Supreme Court has not “settle[d] on a single test for what makes an expectation of privacy ‘reasonable.’”<sup>70</sup> Indeed, “Supreme Court opinions cannot even agree on what kind of test it is. Is it descriptive? Is it normative? Just what does it measure? The cases are all over the map, and the Justices have declined to resolve the confusion.”<sup>71</sup> Kerr pointed out that to most scholars, the failure to elucidate a general test “is widely considered an embarrassment.”<sup>72</sup> To Kerr, however, the lack of a grand unified theory is a feature, not a bug; it is a strength of Fourth Amendment doctrine rather than a weakness. “The Supreme Court,” Kerr argued, “has not and cannot adopt a single test for when an expectation is ‘reasonable’ because no one test effectively and consistently distinguishes the more troublesome police practices that require Fourth Amendment scrutiny from the less troublesome practices that do not.”<sup>73</sup> This is because “the facts of police investigations prove too diverse; no one measurement accurately draws the line in all cases.”<sup>74</sup>

Kerr argued that, from a descriptive standpoint, “[a]lthough the courts speak of a single ‘reasonable expectation of privacy’ test, the one label masks several distinct but coexisting approaches.”<sup>75</sup> Kerr described these coexisting approaches as “four models” of Fourth Amendment protection, and contends that only one model (what he refers to as the probabilistic model) involves the actual expectations of privacy of ordinary citizens.<sup>76</sup> Kerr consequently criticized the use of survey data in the Fourth Amendment context.<sup>77</sup> Slobogin has, however,

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68. Kugler & Strahilevitz, *supra* note 25, at 228.

69. See Orin S. Kerr, *Four Models of Fourth Amendment Protection*, 60 STAN. L. REV. 503, 504 (2007) (asserting that the Supreme Court has not established a standard for “what makes an expectation of privacy constitutionally ‘reasonable’”).

70. *Id.* at 505.

71. *Id.* (emphasis omitted).

72. *Id.* Kerr noted that among scholars, “[t]he Court’s handiwork has been condemned as ‘distressingly unmanageable,’ ‘unstable,’ and ‘a series of inconsistent and bizarre results that [the Court] has left entirely undefended.’” *Id.* (internal citations omitted).

73. *Id.* at 506.

74. *Id.*

75. *Id.*

76. *Id.* at 508.

77. See Orin S. Kerr, *Do We Need a New Fourth Amendment?*, 107 MICH. L. REV. 951 (2009). Kugler and Strahilevitz neatly summarized these concerns as “whether courts have the capacity to assess popular attitudes, whether popular attitudes will fluctuate wildly from day to day, why the content of constitutional provisions should hinge on those attitudes as opposed to doctrines grounded in prior constitutional and property-related precedents, and whether popular attitudes about complicated legal

responded that, upon deeper inspection, each of Kerr's four models collapses into an assessment of intrusiveness<sup>78</sup>—precisely the question Slobogin explored in his survey of public attitudes and precisely the question we explore in the present study.

Kugler and Strahilevitz have provided several additional arguments. First, they pointed out that Kerr's four models predate *Jones* and argued that *Jones* itself seems to reject, at least provisionally and implicitly, some of Kerr's arguments.<sup>79</sup> More fundamentally, Kugler and Strahilevitz have rejected the desirability of the Court having different models from which to pick and choose, "because this approach creates an undue risk of doctrinal incoherence and unpredictability."<sup>80</sup> Kugler and Strahilevitz argued, moreover, that it is "normatively desirable" to base a unitary test for reasonable expectations of privacy on empirical data. They argued that:

The Fourth Amendment is designed to safeguard individuals against governmental overreach. When there is a sharp divide between what the courts describe as the Fourth Amendment's scope and what the people actually expect the Fourth Amendment's scope to be, various problems arise. Law-abiding people may take excessive precautions to protect their information, keeping it not only from the state's agents but also from third parties who could put the information to productive uses. Or citizens might make inordinate investments in learning the contours of Fourth Amendment law, time and money that could be better spent elsewhere. Also, mistaken expectations limit the effectiveness of the democratic process as a check on law enforcement surveillance; the public may not move legislatively to protect privacy if they mistakenly believe it is already protected constitutionally. Disconnects between actual law and perceived law may also provide police officers and prosecutors with undue leverage over citizens.<sup>81</sup>

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and technological issues are meaningful." Kugler & Strahilevitz, *supra* note 25, at 234. In a more recent study, Kugler & Strahilevitz have shown that attitudes on privacy remain relatively stable in response to a new Supreme Court decision. See Matthew B. Kugler & Lior Jacob Strahilevitz, *The Myth of Fourth Amendment Circularity*, 84 U. CHI. L. REV. 1747 (2018). Moreover, in Section V.B, our own study broadly replicated Slobogin and Schumacher's results on "traditional police practices" conducted almost a quarter of a century earlier. These results suggest that concerns about wildly fluctuating attitudes are not well founded.

78. Christopher Slobogin, *Proportionality, Privacy, and Public Opinion: A Reply to Kerr and Swire*, 94 MINN. L. REV. 1588, 1603–04 (2010).

79. Kugler & Strahilevitz, *supra* note 25, at 222 ("Jones itself removes the 'positive law' model from the *Katz* framework. . .").

80. *Id.* at 222.

81. *Id.* at 227. Kugler and Strahilevitz's concern about police officers leveraging citizens' confusion or ignorance of the applicable law has already been recognized as a problem with respect to consent searches. See, e.g., *Schneekloth v. Bustamonte*, 412 U.S. 218, 277, 284–85 (1973) (Marshall, J., dissenting) (criticizing the majority's conclusion that police officers need not inform a person they can decline to consent to search and arguing that "consent cannot be considered a meaningful choice unless he knew that he could in fact exclude the police"); see also *United States v. Drayton*, 536 U.S. 194, 208, 211–12 (2002) (Souter, J., dissenting) (criticizing the majority's conclusion that passengers

We share many of these normative concerns, especially in the realm of emergent technology, social media, and the new (sometimes semi-public) forms that personal communication now take as a result. We find consensus in at least *one* of Kerr’s models—namely the probabilistic model, which requires judges to apply the actual expectations of society. If judges and justices are doing so, and that is normatively desirable, surely it is better that their conclusions be accurate—based on robust empirical data—than limited by their own hunches.

## II.

### EMPIRICAL QUESTIONS AND BACKGROUND

In the previous section, we explained that the threshold question in Fourth Amendment jurisprudence—whether police conduct constitutes a search or seizure—turns on whether the conduct violates a person’s reasonable expectations of privacy or autonomy. Further, we argued that when the Court refers to reasonable expectations about privacy and autonomy, it does or should refer to societal norms or beliefs, which raises the empirical questions we test herein.

In this Part, we explore potential biases and distortions that may make it difficult for judges to perform accurately the task of assessing societal expectations of privacy. Whether they succeed is the empirical question we test below. We also review the prior empirical literature that attempts to quantify those social expectations.

#### *A. The Innocent Person Being Searched versus Hindsight Bias*

Here, we sharpen the doctrinal question in the definition of searches and seizures to focus on the perspective of an *innocent person* who is the subject of the potential search or seizure. While the Fourth Amendment jurisprudence declares that reasonable expectations of privacy be judged from the perspective of an innocent person, in practice those assessments are typically made in hindsight in the context of suppression hearings or after the accused has been found guilty. Our empirical study then asks whether making decisions in these contexts might distort the results so that they do not reflect the outcomes that we would expect if decisions were truly made from the perspective of an innocent person.

The presumption of innocence is a fundamental pillar of the criminal justice system.<sup>82</sup> Accordingly, if the police find incriminating evidence, the success of that search cannot itself inform the question of whether the search was proper.

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on a bus were not seized and consented to being searched, because “[t]he reasonable inference was that the ‘interdiction’ was not a consensual exercise, but one the police would carry out whatever the circumstances; that they would prefer ‘cooperation’ but would not let the lack of it stand in their way”).

82. See *Coffin v. United States*, 156 U.S. 432, 453 (1895); James Bradley Thayer, *The Presumption of Innocence in Criminal Cases*, 6 YALE L.J. 185, 188–89 (1896).

After all, “[t]he Fourth Amendment aims to protect the privacy of all individuals against government intrusion.”<sup>83</sup>

On the other hand, the Supreme Court has repeatedly declared that there is no reasonable or legitimate expectation of privacy in criminal conduct or contraband. For example, in *Rakas v. Illinois*,<sup>84</sup> the Court stated that:

A burglar plying his trade in a summer cabin during the off season may have a thoroughly justified subjective expectation of privacy, but it is not one which the law recognizes as “legitimate.” His presence . . . is “wrongful”; his expectation is not “one that society is prepared to recognize as “reasonable.”<sup>85</sup>

Similarly, the Court has stated on several occasions that investigative techniques that only indicate the presence of contraband substances do not violate any reasonable expectations of privacy. The Court on this basis has held that a trained narcotics detection dog performing a “sniff test” of luggage does not violate the luggage owner’s reasonable expectations of privacy, and therefore is not a search for Fourth Amendment purposes.<sup>86</sup> The Court explained that:

A “canine sniff” by a well-trained narcotics detection dog . . . does not require opening the luggage. It does not expose noncontraband [sic] items that otherwise would remain hidden from public view, as does, for example, an officer’s rummaging through the contents of the luggage. . . . Moreover, the sniff discloses only the presence or absence of narcotics, a contraband item. . . . This limited disclosure also ensures that the owner of the property is not subjected to the embarrassment and inconvenience entailed in less discriminate and more intrusive investigative methods.<sup>87</sup>

The Court has applied this logic to the use of drug detection dogs to determine the presence of illegal drugs in cars.<sup>88</sup> The Court also used the same reasoning in *United States v. Jacobsen*<sup>89</sup> to hold that a field chemical test for narcotics was not a Fourth Amendment search. The Court reasoned:

A chemical test that merely discloses whether or not a particular substance is cocaine does not compromise any legitimate interest in privacy . . . [V]irtually all of the tests conducted . . . would result in a

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83. Shima Baradaran, *Rebalancing the Fourth Amendment*, 102 GEO. L.J. 1 (2013).

84. 439 U.S. 128 (1978).

85. *Id.* at 143 n.12 (citing *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring)); see also *Slobogin & Schumacher*, *supra* note 7, at 732 (quoting *Rakas*, 439 U.S. at 143 n.12, and concluding that “[i]n short, the Fourth Amendment does not protect expectations of privacy that only a criminal would have”).

86. *United States v. Place*, 462 U.S. 696, 707 (1983) (“[E]xposure of respondent’s luggage, which was located in a public place, to a trained canine [] did not constitute a ‘search’ within the meaning of the Fourth Amendment.”).

87. *Id.*

88. See, e.g., *Indianapolis v. Edmond*, 531 U.S. 32, 40 (2000) (holding that an exterior sniff is not a search); see also *Illinois v. Caballes*, 543 U.S. 405, 409 (2005) (holding that the use of narcotics dog to sniff exterior of vehicle during lawful traffic stop not a search).

89. 466 U.S. 109 (1984).

positive finding; in such cases, no legitimate interest has been compromised. But even if the results are negative—merely disclosing that the substance is something other than cocaine—such a result reveals nothing of special interest. Congress has decided . . . to treat the interest in “privately” possessing cocaine as illegitimate; thus governmental conduct that can reveal whether a substance is cocaine, and no other arguably “private” fact, compromises no legitimate privacy interest.<sup>90</sup>

In other words, government investigative conduct only violates reasonable expectations of privacy if there is some possibility that the conduct will expose an *innocent* private fact. For example, the physical search of luggage violates reasonable expectations of privacy because, unlike a canine sniff of the exterior, physically opening luggage potentially exposes non-contraband items contained in the luggage—therefore potentially exposing the owner of the luggage to “embarrassment and inconvenience.”<sup>91</sup> Thus, when examining whether government conduct violates reasonable expectations of privacy, the Court considers whether the conduct could conceivably reveal innocent, private information—such as “letters or photographs”<sup>92</sup> or “at what hour each night the lady of the house takes her daily sauna and bath.”<sup>93</sup>

The Court’s search cases therefore demonstrate that the determination of whether governmental conduct violates reasonable expectations of privacy assumes that the target of the conduct is innocent of any criminal wrongdoing. The investigative conduct can only violate reasonable privacy expectations if it could conceivably reveal innocent information.

Moreover, the Court has also instructed that courts apply the innocent-person perspective to determine whether government conduct is a seizure (as opposed to whether it is a search). In *Florida v. Bostick*,<sup>94</sup> for example, the Court addressed whether police seized defendants during a “drug interdiction” on a long haul bus. In holding that the defendants were not seized because a reasonable person would have felt free to terminate the police encounter, the Court explicitly stated that “the ‘reasonable person’ test presupposes an *innocent*

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90. *Id.* at 123; see also *Florida v. Royer*, 460 U.S. 491, 519 n.4 (1983) (Blackmun, J., dissenting), cited with approval by *Florida v. Bostick*, 501 U.S. 429 (1991). “The fact that Royer knew the search was likely to turn up contraband is of course irrelevant; the potential intrusiveness of the officers’ conduct must be judged from the viewpoint of an innocent person in Royer’s position.” *Royer*, 460 U.S. at 519 n.4; see also Arnold H. Loewy, *The Fourth Amendment as a Device for Protecting the Innocent*, 81 MICH. L. REV. 1229 (1983).

91. *Place*, 462 U.S. at 707.

92. *Arizona v. Hicks*, 480 U.S. 321, 325 (1987) (“It matters not that the search uncovered nothing of any great personal value to respondent . . . rather than (what might conceivably have been hidden behind or under the equipment) letters or photographs.”).

93. *Kyllo v. United States*, 533 U.S. 27, 38 (2001); see also *Oliver v. United States*, 466 U.S. 170, 192 (1984) (Marshall, J., dissenting) (arguing that there is a reasonable expectation of privacy in privately owned, undeveloped land because “many landowners like to take solitary walks,” “meet lovers” or “fellow worshippers,” or conduct other criminally innocent activities on their properties).

94. 501 U.S. 429 (1991).

person.”<sup>95</sup> Similarly, in *Michigan Department of State Police v. Sitz*,<sup>96</sup> the Court considered the degree of intrusion that a roadside sobriety checkpoint imposed from the point of view of the innocent driver: “The ‘fear and surprise’ to be considered are not the natural fear of one who has been drinking over the prospect of being stopped at a sobriety checkpoint but, rather, the fear and surprise engendered in law-abiding motorists by the nature of the stop.”<sup>97</sup>

All of this suggests that the innocent person is the lodestar of Fourth Amendment analyses. Nonetheless, efforts to enforce the amendment’s protections are almost “always presented to courts by a criminal defendant whose hands are dirty.”<sup>98</sup> Courts typically make these assessments in the context of suppression hearings, where a search yielded incriminating evidence, which is itself squarely before the court.<sup>99</sup> A judge’s exposure to that information could well bias the court against more robust applications of the Fourth Amendment.

Rarely do Fourth Amendment issues arise in cases without incriminating evidence. Although individuals can sue for Fourth Amendment violations under 42 U.S.C. § 1983, Fourth Amendment cases are usually brought when the police have failed to find incriminating evidence.<sup>100</sup> § 1983 claims are far less common than suppression hearings and appeals of decisions about whether to suppress evidence in criminal trials.<sup>101</sup> This is certainly the case when we look at Supreme Court decisions. In case after case, the Justices knew of incriminating evidence that the police found when they decided whether particular conduct violated a person’s reasonable expectations of privacy.<sup>102</sup>

95. *Id.* at 438.

96. 496 U.S. 444 (1990).

97. 496 U.S. at 452.

98. Baradaran, *supra* note 83, at 1.

99. *See, e.g.*, Slobogin & Schumacher, *supra* note 7, at 771 (“The typical Fourth Amendment case involves a clearly guilty person, often charged with a serious crime, whose only argument at a pretrial suppression hearing or on appeal is that the evidence against him was illegally seized.”).

100. *See, e.g.*, *City of Indianapolis v. Edmond*, 531 U.S. 32, 36 (2000) (addressing a request for declaratory relief by two motorists who “were each stopped at a narcotics checkpoint,” which uncovered no evidence of wrongdoing, and who “filed a lawsuit on behalf of themselves and the class of all motorists who had been stopped or were subject to being stopped in the future”); *see also* Nancy Leong, *Making Rights*, 92 B.U. L. REV. 405, 432 (2012) (addressing the problem in § 1983 claims of “[h]ow does one value the harm to an innocent plaintiff illegally detained for five minutes in order to perform a stop and frisk that yielded no evidence?”).

101. Leong, *supra* note 100, at 422–23 (finding that between 2005 and 2009, 71 percent of published appellate decisions involving Fourth Amendment claims related to suppression hearings and 28 percent related to § 1983 claims).

102. *See, e.g.*, *United States v. Jones*, 565 U.S. 400, 403–04 (2012) (“The Government introduced at trial the same GPS-derived locational data . . . which connected Jones to the alleged conspirators’ stash house that contained \$850,000 in cash, 97 kilograms of cocaine, and 1 kilogram of cocaine base.”); *Florida v. Bostick*, 501 U.S. 429, 431 (1991) (holding that police officers did not seize the defendant when they boarded a long-haul bus at a scheduled stop and “discovered cocaine when they searched a suitcase belonging to [the defendant]”); *Oliver v. United States*, 466 U.S. 170, 173 (1984) (holding that police officers trespass onto private land outside the curtilage, which revealed “a field of marihuana,” was not a search); *Olmstead v. United States*, 277 U.S. 438, 455–56 (1928) (holding a federal wiretap was not a search, wherein it “disclose[d] a conspiracy of amazing magnitude to import, possess, and sell

Although judges know that they should not consider incriminating evidence in determining whether a search or seizure violated the Fourth Amendment, it is easier said than done. Indeed, the Supreme Court acknowledged this problem in *Beck v. Ohio* when they suggested that decisions made before a search takes place are more reliable than those made afterwards because of concerns of “hindsight judgment.”<sup>103</sup> Psychological studies have confirmed that individuals are susceptible to hindsight bias. Accordingly, we hypothesize that exposure to incriminating evidence can reduce the likelihood of judges finding a violation of reasonable expectations of privacy than they would absent that exposure. If true, this suggests that courts might be under-protecting privacy interests under the Fourth Amendment.

Numerous studies have shown that hindsight bias can impact decision making. As early as 1975, Baruch Fischhoff demonstrated that when people know of a particular outcome, they tend to overestimate the likelihood of that outcome.<sup>104</sup> Jeffrey Rachlinski has provided an exhaustive catalog of studies demonstrating this type of hindsight bias in a broad range of contexts.<sup>105</sup> These include studies that ask individuals to predict the likelihood of events as disparate as the consequences of diplomatic missions and the findings of the Rodney King case.<sup>106</sup> But hindsight bias is not limited to misestimating likelihoods.

Another related form of hindsight bias is sometimes called “outcome bias.”<sup>107</sup> Outcome bias occurs when the consequences of a decision have inordinate influence on the assessment of that decision’s quality. In some cases,

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liquor unlawfully,” including “the employment of not less than 50 persons, of two sea-going vessels for the transportation of liquor to British Columbia, of smaller vessels for coastwise transportation to the state of Washington” and aggregate annual sales that “must have exceeded \$2,000,000”).

103. 379 U.S. 89, 96 (1964) (“An arrest without a warrant bypasses the safeguards provided by an objective predetermination of probable cause, and substitutes instead the far less reliable procedure on an after-the-event justification for the arrest or search, too likely to be subtly influenced by the familiar shortcomings of hindsight judgment.”); see also *Draper v. United States*, 358 U.S. 307 (1959) (Douglas, J., dissenting) (“Decisions under the Fourth Amendment, taken in the long view, have not given the protection to the citizen which the letter and spirit of the Amendment would seem to require. One reason, I think, is that wherever a culprit is caught red-handed, as in leading Fourth Amendment cases, it is difficult to adopt and enforce a rule that would turn him loose.”); William J. Stuntz, *Warrants and Fourth Amendment Remedies*, 77 VA. L. REV. 881, 915 (1991) (arguing that granting warrants before a magistrate knows whether the police will find evidence or whether the suspect is a criminal helps eliminate judicial bias).

104. Baruch Fischhoff, *Hindsight ≠ Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPERIMENTAL PSYCHOL.: HUM. PERCEPTION & PERFORMANCE 288 (1975).

105. Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 578–80 (1998).

106. See Baruch Fischhoff & Ruth Beyth, “I Knew It Would Happen”: *Remembered Probabilities of Once-Future Things*, 13 ORG. BEH. & HUM. PERFORMANCE 1, 6–7 (1975) (discussing Nixon’s 1972 diplomatic missions to China and Russia); Lee J. Gilbertson et al., *A Study of Hindsight Bias: The Rodney King Case in Retrospect*, 74 PSYCH. REP. 383, 385 (1994).

107. The nomenclature is inconsistent. Sometimes scholars simply call this phenomenon “hindsight bias” while others consider it a separate but related phenomenon called outcome bias. From this point onwards, we use the term outcome bias except when quoting others.

using outcomes to assess actions is perfectly logical.<sup>108</sup> For example, when a toaster explodes, evidence tends to show that some defect caused the explosion. Thus, it is hardly surprising that people associate positive outcomes with good decisions and negative outcomes with poor decisions.

In contrast, outcome bias exists when evidence of outcome is given too much weight—or in its extreme form, when that evidence should have no bearing on the decision at issue. Determining whether particular conduct is a search that the Fourth Amendment protects falls into this latter category. The legal test asks whether the police violated the subject's reasonable expectations of privacy. Those expectations are unrelated to whether or not incriminating evidence is found. To the extent that incriminating evidence plays a role in classifying conduct as searches, it is fair to say those decisions suffer from outcome bias.

Studies have shown outcome bias occurs in many contexts.<sup>109</sup> For example, Jonathan Baron and John Hershey found that individuals evaluated the same sets of physician decisions differently depending on whether they were told the outcome was a success or a failure.<sup>110</sup> In one of their experiments, participants concluded that the same physician decisions were more “correct” than “incorrect” when particular treatments were successful.<sup>111</sup> Kim Kamin and Jeffrey Rachlinski found outcome bias when assessing the need for anti-flood precautions.<sup>112</sup> Reid Hastie, David Schkade, and John Payne found that individuals were less likely to conclude that a train was safe to operate after they were told it had an accident.<sup>113</sup>

More importantly for our purposes, two studies have tested hindsight bias in the context of Fourth Amendment searches with somewhat contradictory findings. In 1989, Jonathan Casper, Kennette Benedict, and Jo Perry tested outcome bias in a § 1983 civil rights action.<sup>114</sup> They demonstrated that when mock jurors were told that the search found evidence of illegal conduct, the mock jurors were nine percent less likely to find the police liable for violating the

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108. See Maggie Wittlin, *Hindsight Evidence*, 116 COLUM. L. REV. 1323, 1334 (2016) (“When one occurrence tends to lead to another, evidence of the second occurrence is suggestive of the first.”); Fischhoff & Beyth, *supra* note 106, at 2 (“[I]n many cases the postdictive probability of events which have happened is justifiably higher than the corresponding predictive probability.”).

109. See Jay J.J. Christensen-Szalanski & Cynthia Fobian Willham, *The Hindsight Bias: A Meta-Analysis*, 48 ORG. BEHAV. & HUM. DECISION PROCESSES 147 (1991) (reviewing 122 studies of hindsight bias).

110. See Jonathan Baron & John C. Hershey, *Outcome Bias in Decision Evaluation*, 54 J. PERSONALITY & SOC. PSYCHOL. 569, 571–74 (1988).

111. *Id.* at 571–72.

112. Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post ≠ Ex Ante: Determining Liability in Hindsight*, 19 LAW & HUM. BEHAV. 89, 98 (1995).

113. See Reid Hastie, David A. Schkade & John W. Payne, *Juror Judgments in Civil Cases: Hindsight Effects on Judgments of Liability for Punitive Damages*, 23 LAW & HUM. BEHAV. 597, 609–10 (1999).

114. Jonathan D. Casper, Kennette Benedict & Jo L. Perry, *Juror Decision Making, Attitudes, and the Hindsight Bias*, 13 LAW & HUM. BEHAV. 291 (1989).



subject's civil rights.<sup>115</sup> Moreover, to the extent the mock jurors did find liability, they awarded both smaller compensatory and punitive damage awards.<sup>116</sup> Subsequently, Jeffrey Rachlinski, Chris Guthrie, and Andrew Wistrich conducted a series of experiments aimed at determining whether hindsight bias affected judges' decision making. In most of the experiments, they found that hindsight bias affected judges to a similar degree as ordinary people.<sup>117</sup> However, in one experiment they found an anomaly: hindsight bias did not appear to affect judges when making probable cause determinations.<sup>118</sup> In that experiment, researchers gave one group of judges a factual pattern and asked them if there was sufficient probable cause to issue a search warrant (i.e., the foresight condition). The researchers then gave a second group of judges the same factual pattern but told them that the search had found incriminating evidence (i.e., the hindsight condition).<sup>119</sup> Researchers also asked them whether there was probable cause, but in the context of a suppression hearing. In the foresight condition, 23.9% (11 out of 46) of the judges concluded that there was probable cause for a search and granted a warrant and, in the hindsight condition, 27.7% (13 out of 47) of the judges concluded that there was probable cause for a search and admitted the testimony.<sup>120</sup> Relying on this data, the authors concluded that "[j]udges were able to ignore the damning evidence that the search produced and make essentially the same decision as judges who were unaware of what the search would uncover."<sup>121</sup>

Concerned that their first experiment was insufficiently powered, Rachlinski et al. proceeded to conduct three more experiments to test whether hindsight bias affected judges as they made probable cause determinations.<sup>122</sup> Combining the results from these experiments, they found that 41.6% (126 out of 303) of judges found probable cause in the foresight conditions and 45.4%

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115. *Id.* at 299 (across all three types of criminal activity tested).

116. *Id.* at 299–300.

117. See Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *The "Hidden Judiciary": An Empirical Examination of Executive Branch Justice*, 58 DUKE L.J. 1477, 1512–16 (2009) (finding hindsight bias affected state judges' decisions); Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Inside the Judicial Mind*, 86 CORNELL L. REV. 777, 818 (2001) (finding that the magnitude of the effects of hindsight bias in judges was comparable to that found when studying mock juries and laypersons); Andrew J. Wistrich, Chris Guthrie & Jeffrey J. Rachlinski, *Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding*, 153 U. PENN. L. REV. 1251, 1323 (2005) (finding hindsight bias in most contexts in seven experiments).

118. Wistrich et al., *supra* note 117, at 1283.

119. The evidence was "10 pounds of methamphetamine, other drug paraphernalia, and a gun that had recently been fired." *Id.* at 1315.

120. *Id.* at 1316.

121. *Id.* at 1317.

122. Jeffrey J. Rachlinski, Chris Guthrie & Andrew J. Wistrich, *Probable Cause, Probability, and Hindsight*, 8 J. EMPIRICAL LEGAL STUD. 72, 75–76 (2011). Indeed, using their data, our own calculations suggests that the 95% confidence of their first experiment was between negative 15% to a positive 22%. Thus, these results do not disprove the existence of hindsight bias. On the importance of using confidence intervals, see John M. Hoening & Dennis M. Heisey, *The Abuse of Power: The Pervasive Fallacy of Power Calculations for Data Analysis*, 55 AM. STATISTICIAN 19 (2001).

(132 out of 291) found probable cause in the hindsight conditions.<sup>123</sup> Rachlinski et al. summarized their findings: “Judges seem able to overcome a pervasive cognitive bias in judgment on an important aspect of the criminal justice system.”<sup>124</sup>

Now one may suppose that judges’ special training and education may allow them to perform better than the mock jurors in Casper’s study.<sup>125</sup> We remain skeptical. As Rachlinski and his co-authors acknowledge, their findings are inconsistent with the vast body of literature on hindsight bias, including their own previous studies that found that hindsight bias does affect judges.<sup>126</sup> Moreover, we have two specific concerns about their most recent results. First, the team’s very success may have adversely affected their ability to repeat the same kind of experiment with more judges. Judges may be getting “savvy” to their tests.<sup>127</sup> If judges had read the team’s prior published work or talked with past participants in any of the other nine judicial conferences where the experiments were run, they may have become aware of the purpose of the experiment.<sup>128</sup> It is not apparent from the papers whether the authors examined this particular threat to validity by, for example, asking respondents what they believed was the purpose of the study.

Second, the studies cover different scenarios. Therefore, it is not appropriate to simply aggregate the results as if they represented one experiment. A better approach would be to use a logistic regression that treats each study as a separate factor. We performed such an analysis and found that the results point in the direction of hindsight bias but are not statistically significant at the  $p = .05$  level.<sup>129</sup> In other words, the 95% confidence interval includes the possibilities that hindsight information may either increase or decrease the likelihood that a judge would find a Fourth Amendment violation.

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123. Rachlinski et al., *supra* note 122, at 93.

124. *Id.* at 98.

125. *Id.* at 96–97.

126. See *supra* notes 109–18 and accompanying text. Nancy Leong has also found that civil plaintiff’s asserting Fourth Amendments claims are far more successful than criminal defendants asserting a Fourth Amendment defense. Unfortunately, it is impossible to disentangle sample biases because the civil cases are likely to differ significantly from their criminal counterparts. See Leong, *supra* note 100, at 429; see also Jeffrey A. Segal & Benjamin Woodson, Motivated Cognition on the Bench: Does Criminal Egregiousness Influence Judges’ Admissibility Decisions in Search-and-Seizure Cases? 23–24 (Apr. 23, 2014) (unpublished manuscript) (on file with *California Law Review*) (analyzing 558 search and seizure decisions and concluding that judges consider the seriousness of the crime when making exclusionary rule decisions, but only for the most intrusive searches).

127. See Yanna Krupnikov & Adam Seth Levine, *Cross-Sample Comparisons and External Validity*, 1 J. EXPERIMENTAL POL. SCI. 59, 62 (2014) (describing how knowledge of experimental manipulations can contaminate responses).

128. See Rachlinski et al., *supra* note 122, at 76 (explaining that the studies were conducted across ten judicial conferences). On the importance of blinding social science research, see generally CHRISTOPHER T. ROBERTSON & AARON S. KESSELHEIM, BLINDING AS A SOLUTION TO BIAS: STRENGTHENING BIOMEDICAL SCIENCE, FORENSIC SCIENCE, AND LAW (2016).

129. The log of the ratio of the odds of granting with hindsight to granting without hindsight was 0.166 ( $p = .339$ ). The 95% confidence interval ranges from -0.174 to 0.506.

*B. The First Person Perspective versus Egocentrism*

The Supreme Court's Fourth Amendment decisions also make it clear a person's reasonable expectations of privacy should be judged from the subjective perspective of the person being searched.<sup>130</sup> Although the test is not merely subjective (based on the peculiar beliefs of the actual person being searched), the reasonableness is judged from the perspective of the person being investigated or restrained, not from the perspective of an impartial bystander.

This first person perspective is evident in *Katz* itself. The first prong of the *Katz* two-part test is whether the person being investigated "exhibited an actual [subjective] expectation of privacy."<sup>131</sup> The second prong asks whether that expectation of privacy—that is, the actual expectation the person investigated subjectively held—is "one that society is prepared to recognize as 'reasonable.'"<sup>132</sup>

The Supreme Court's subsequent application of the *Katz* test makes clear that the test of reasonableness is considered from the first person perspective. To take but one example, in the *Ciraolo* decision discussed above, the Court concluded that "*respondent's* expectation that his garden was protected from such observation is unreasonable,"<sup>133</sup> and "it is unreasonable for *respondent* to expect that his marijuana plants were constitutionally protected from being observed with the naked eye from an altitude of 1,000 feet."<sup>134</sup>

Nonetheless, when judges actually make such determinations about the intrusiveness of police conduct, they are never the subject of the search. They are sitting in judgment.

We hypothesize that judges will evaluate actions directed against others less harshly than actions directed to themselves. This would be a kind of egocentric bias. Studies have shown that perspective can affect moral judgments. People provide higher estimates of what is a fair wage or a fair settlement when they assume that the outcome will benefit them.<sup>135</sup> One experiment even demonstrated that students characterized librarians as more moral (honest, fair, and proper) when the librarians broke rules (i.e., waived fines) that benefited the students as opposed to others.<sup>136</sup> Thus, the typical understanding of self-interest

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130. *Florida v. Bostick*, 501 U.S. 429, 438 (1991) (citing with approval *Florida v. Royer*, 460 U.S. 491, 519 n.4 (1983) (Blackmun, J., dissenting)).

131. *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring).

132. *Id.*

133. *California v. Ciraolo*, 476 U.S. 207, 214 (1986) (emphasis added).

134. *Id.* at 215 (emphasis added).

135. David M. Messick & Keith Sentis, *Fairness, Preference, and Fairness Biases*, in *EQUITY THEORY: PSYCHOLOGICAL AND SOCIOLOGICAL PERSPECTIVES* 135, 153 (David M. Messick & Karen S. Cook eds, 1983); George Loewenstein et al., *Self-Serving Assessments of Fairness and Pretrial Bargaining*, 22 *J. LEGAL STUD.* 135, 135–59 (1993).

136. Konrad Bocian & Bogdan Wojciszke, *Self-Interest Bias in Moral Judgments of Others' Actions*, 40 *PERSONALITY & SOC. PSYCHOL. BULL.* 1, 4–5 (2014).

bias in the moral decision-making context is that individuals find behavior to be fairer or more just when it benefits them.

A natural corollary is that individuals are likely to characterize behavior as less fair when it harms them. Thus, when police conduct is directed at a person, that person is more likely to think that such conduct is unfair (first person), or in the language of the Fourth Amendment “unreasonable,” than when the same conduct is directed at another person (third person). If judges are susceptible to this kind of self-interest bias, we would expect them to be less likely to find that the Fourth Amendment protects against police searches.

Self-interest may not be the only explanation for egocentric biases. Nicholas Epley and Eugene Caruso suggest a different explanation. They argue that people make moral judgments using their own perspective because of “automatic and unconscious psychological mechanisms.”<sup>137</sup> But regardless of the root cause of egocentric biases, our hypothesis is that such a bias may be present in the Fourth Amendment context. If it is present, we would expect to see courts under-protect an individual’s Fourth Amendment rights.<sup>138</sup>

Slobogin and Schumacher tested this very issue. They found “clear support for the proposition that searches and seizures tend to be viewed as more intrusive when their target is the subject-participant rather than ‘another’ . . . .”<sup>139</sup> Kugler and Strahilevitz also found a “slight[]” first person effect.<sup>140</sup> Our study seeks to replicate these findings using a larger and more representative sample. Moreover, instead of only using the intrusiveness scale that Slobogin and Schumacher used, we also ask participants the question the Supreme Court’s test posed: does the conduct described in each scenario violate reasonable expectations of privacy? Framing questions in this way may help us understand the potential impact of these biases. Specifically, we can learn if there are any scenarios where participants would say that their expectations of privacy are not violated in the third person/no outcome condition, but are violated in the first person/outcome condition.

### C. *Criminal Justice Experience, Race, Ethnicity, and Gender*

The members of the judiciary who decide Fourth Amendment questions on behalf of the American society are not representative of the nation as a whole.

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137. Nicholas Epley & Eugene M. Caruso, *Egocentric Ethics*, 17 SOC. JUST. RES. 171, 173 (2004).

138. We make no claims that the first person perspective is actually better than the third-person for purpose of determining what conduct should be classified as a search under the Fourth Amendment. Rather we simply accept the Supreme Court’s jurisprudence and suggest that judges may have difficulty correctly applying the existing standard because of egocentric bias.

139. Slobogin & Schumacher, *supra* note 7, at 759–60. The study had participants rate 50 scenarios’ “intrusiveness” on a scale from 1 to 100. Participant responses to scenarios framed in the first person averaged 60.3 while responses to those framed in the third person averaged 56.3 ( $p < .05$ ). *Id.* at 759–60 & n.109.

140. Kugler & Strahilevitz, *supra* note 25, at 248 n.170.

Though trends are complex, prior literature shows demographic factors may shape a wide range of perceptions.<sup>141</sup> If demographic factors shape perceptions of police activities, differences between the demographics of the public and the judiciary could systematically distort decisions concerning potential Fourth Amendment violations. For this analysis, we review the demographics of the federal judiciary as well as state judiciaries, whose criminal docket dwarfs the federal docket.<sup>142</sup>

African Americans and Hispanics are also much more likely to be imprisoned in the U.S.<sup>143</sup> They are also more likely to be the subject of a police search.<sup>144</sup> Recently, litigation over New York's stop and frisk policy concluded that "the NYPD carries out more stops in areas with more black and Hispanic residents, even when other relevant variables are held constant," and "within any area, regardless of its racial composition, blacks and Hispanics are more likely to be stopped than whites."<sup>145</sup> These experiences with the criminal justice system could shape perceptions of the police among the defendants, their friends, and their families.<sup>146</sup> In comparison to the most often targeted minority populations, judges presumably have little experience as the target of a police investigation or incarceration.

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141. See, e.g., Jeffrey J. Rachlinski, et al., *Does Unconscious Racial Bias Affect Trial Judges?*, 84 NOTRE DAME L. REV. 1195 (2009) (reporting experiments with actual judges showing implicit biases, which were not consistently evoked in simulated judicial decisions); Sunita Sah, Christopher T. Robertson & Shima B. Baughman, *Blinding Prosecutors to Defendants' Race: A Policy Proposal to Reduce Unconscious Bias in the Criminal Justice System*, 1 BEHAV. SCI. & POL'Y 69, 69–76 (2015) (reviewing the literature for race in the context of prosecutorial decision making); Max Schanzbach, *Racial and Sex Disparities in Prison Sentences: The Effect of District-level Judicial Demographics*, 34 J. LEGAL STUD. 57, 57–92 (2005) (finding that "judges' race and sex have little influence on prison sentences in general but do affect racial and sex disparities").

142. State courts handled 1.1 million felony convictions in a recent year versus 80,000 federal defendants sentenced. See MATTHEW R. DUROSE & PATRICK A. LANGAN, BUREAU OF JUSTICE STATISTICS, NCJ 215646, FELONY SENTENCES IN STATE COURTS, 2004 (2007), <http://www.bjs.gov/content/pub/pdf/fssc04.pdf> [<https://perma.cc/63L2-6UQU>].

143. See PAUL GUERINO, PAIGE M. HARRISON & WILLIAM J. SABOL, BUREAU OF JUSTICE STATISTICS, NCJ 236096, PRISONERS IN 2010, at 7 (2012), <http://www.bjs.gov/content/pub/pdf/p10.pdf> [<https://perma.cc/P5K3-J5NL>] (internal citation omitted) ("[B]lack non-Hispanic males had an imprisonment rate (3,074 per 100,000 U.S. black male residents) that was nearly 7 times higher than white non-Hispanic males (459 per 100,000."); see also *id.* at 26 (providing statistics for Hispanic prisoners).

144. See, e.g., BERNARD E. HARCOURT, ILLUSION OF ORDER: THE FALSE PROMISE OF BROKEN WINDOWS POLICING 173–75 (2001) (discussing New York City's stop-and-frisk policy's disproportionate effect on racial minorities); DAVID A. HARRIS, PROFILES IN INJUSTICE: WHY RACIAL PROFILING CANNOT WORK 62–64 (2002) (discussing racial disparities in stopping and searching motorists).

145. *Floyd v. City of New York*, 959 F. Supp. 2d 540, 589 (S.D.N.Y. 2013).

146. See Tom R. Tyler, Jeffrey Fagan & Amanda Geller, *Street Stops and Police Legitimacy: Teachable Moments in Young Urban Men's Legal Socialization*, 11 J. EMPIRICAL LEGAL STUD. 751 (2014).

Unsurprisingly, the judiciary tends to be more male, white, affluent, and educated than ordinary members of the public.<sup>147</sup> While women comprise slightly more than half the general population, they only make up 37 percent of active U.S. Circuit Court judges and 34 percent of active U.S. District Court judges.<sup>148</sup> The numbers for women on the state court level are similar to the federal numbers, and not a single state has as many women judges as men.<sup>149</sup>

The story is more nuanced for African American judges. While they are now fairly well-represented in the federal judiciary, that has not historically been the case. In 2010, African Americans made up 12.6 percent of the U.S. population.<sup>150</sup> The numbers for active federal courts now roughly corresponds to that number: 13 percent of active U.S. Circuit Court judges and 14 percent of active U.S. District Court judges are African American.<sup>151</sup> However, if we look at judges that have taken senior status (as of March 7, 2014), the numbers drop to 5.3 percent and 6.6 percent, respectively.<sup>152</sup> Since senior judges are those who have been serving for longer periods of time, it is fair to suggest that African American federal judges have likely decided proportionately fewer Fourth Amendment cases. That suggests that African American federal judges likely have had less impact on the precedent—going back as far as fifty years on what constitutes reasonable expectations of privacy—that now shapes decisions. In addition, state courts are not nearly as representative as the federal judiciary. As of 2014, African Americans only made up 7.2 percent of state court judges.<sup>153</sup>

Hispanics are still underrepresented on both the federal and state benches. In 2010, Hispanics made up 17.3 percent of the population.<sup>154</sup> Yet, as of 2014, Hispanics only made up 9 percent of active and 3.5 percent of senior federal circuit court judges, and 10 percent of active and 3.2 percent of senior federal district court judges.<sup>155</sup> Their numbers were even smaller at the state level, making up only 5.4 percent of state court judges.<sup>156</sup>

Judges are also more educated and wealthier than typical Americans. By virtue of their position, they all (or substantially all) have a law degree, while

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147. One recent study found that white men are the most overrepresented group (nearly double the numbers found in the general population). TRACEY E. GEORGE & ALBERT H. YOON, AM. CONSTITUTION SOC'Y, *THE GAVEL GAP: WHO SITS IN JUDGMENT ON STATE COURTS?* 7 (2016).

148. See BARRY J. MCMILLION, CONG. RESEARCH SERV., U.S. CIRCUIT AND DISTRICT COURT JUDGES: PROFILE OF SELECT CHARACTERISTICS 4, 15 (2017), <http://fas.org/sgp/crs/misc/R43426.pdf> [<https://perma.cc/ZG5L-5N8T>].

149. GEORGE & YOON, *supra* note 147, at 18 tbl.A-6 (finding that women make 30.2 percent of state court judges).

150. See Appendix B (containing demographics data from the 2010 U.S. Census).

151. MCMILLION, *supra* note 148, at 5, 17.

152. See BARRY J. MCMILLION, U.S. CIRCUIT AND DISTRICT COURT JUDGES: PROFILE OF SELECT CHARACTERISTICS 13, 21 (2014) [hereinafter MCMILLION 2014].

153. GEORGE & YOON, *supra* note 147, at 18 tbl.A-7.

154. See Appendix B.

155. MCMILLION 2014, *supra* note 152, at 13, 21.

156. GEORGE & YOON, *supra* note 147, at 18 tbl.A-7.

only 1.4 percent of the general population have a professional degree.<sup>157</sup> Judicial salaries uniformly exceed \$100,000, sometimes by a great deal,<sup>158</sup> while the large majority of Americans make substantially less than this amount.<sup>159</sup> Given these additional differences in demographics, it would not be surprising if judges' attitudes differed from the population at large. If these demographic disparities cause disparities in perceptions of police activities, such a result would, on the Court's own terms, undermine the Court's decisions and jurisprudence on what constitutes a Fourth Amendment search or seizure. Such a result would raise questions about the sociological legitimacy of police behavior, which relies on the legal doctrine.

#### D. *Prior Studies on Expectations of Privacy*

Several prior empirical studies have investigated reasonable expectations of privacy. Slobogin and Schumacher's landmark 1993 study assessed the relative level of "intrusiveness" of different types police conduct.<sup>160</sup> They asked 217 participants to rate fifty scenarios on a 1-100 "intrusiveness" scale.<sup>161</sup> In addition to testing attitudes given particular scenarios, Slobogin and Schumacher sought to test whether first person bias and/or context affected people's attitudes. They posed scenarios either as if they were happening to the participant (first person) or someone else (third person). In another manipulation, they told one group of participants what evidence the police were hoping to obtain while withholding this information from another group.<sup>162</sup>

While Slobogin and Schumacher found that in many cases individual attitudes generally corresponded to Supreme Court jurisprudence, in other areas they found that the Court often underestimated what members of the public thought was private.<sup>163</sup> Perhaps more importantly, they also explored why Court doctrine might differ from the ordinary person's privacy views. They found that individuals saw conduct as more intrusive when presented with scenarios in the first person condition than when presented in the third person, which corresponds to a judge's third person perspective.<sup>164</sup> Additionally, when individuals were not

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157. See Appendix B (counting PhD and Masters degrees as equivalent would add 1.2 percent and 6.7 percent respectively).

158. CIARA TORRES-SPELLISCY, MONIQUE CHASE & EMMA GREENMAN, BRENNAN CTR. FOR JUSTICE, IMPROVING JUDICIAL DIVERSITY (2010); WOMEN AND THE LAW 50 app.E (Jane C. Moriarty ed., 2009) (surveying judicial salaries in ten states which all exceed \$100,000). The base salary of a U.S. District Judge in 2017 is \$205,100. See *Judicial Compensation*, U.S. COURTS, <http://www.uscourts.gov/judges-judgeships/judicial-compensation> [https://perma.cc/3CQH-RVU3].

159. See Appendix B (showing that the percentage of Americans that make more and less than \$50,000 is fairly evenly split).

160. Slobogin & Schumacher, *supra* note 7.

161. *Id.* at 735–39.

162. *Id.* at 732, 735–36.

163. *Id.* at 739–42. Slobogin & Schumacher note that attitudes and court doctrine diverged in the use of undercover agents and dog sniffing, among others. *Id.*

164. *Id.* at 759–61.

told the search's objective, they found the conduct less intrusive.<sup>165</sup> The authors interpret their results as suggesting that the courts, which commonly make decisions knowing that evidence has been found, "underestimate the intrusiveness of police actions . . . ."<sup>166</sup>

While Slobogin and Schumacher's study was groundbreaking for its time, their sample was both small and unrepresentative. With the exception of twenty-five citizens of Gainesville, Florida, the 217 participants were students, some from Australia.<sup>167</sup> Moreover, while the authors speculated that participants may have been using hindsight bias in their response, the questions actually only told participants the objective of the investigation. The questions did not say anything about the outcome.<sup>168</sup> Because the participants may have taken the questions at face value without assuming any particular outcome, the survey was not properly designed to test for hindsight/outcome bias.<sup>169</sup>

Over the following two decades, researchers conducted a handful of follow-up studies that focused on narrower issues. However, because these studies often used very specific populations, they may not reflect the attitudes of society as a whole. For example, in 2002, Slobogin relied on a sample of 190 people called for jury duty in Gainesville, Florida, to examine privacy attitudes on the use of camera surveillance.<sup>170</sup> A few years later, Slobogin surveyed privacy attitudes on data mining using seventy-six members of the Gainesville jury pool.<sup>171</sup> In a 2009 study relying on a sample of 159 undergraduate psychology students, Jeremy Blumenthal et al. looked at how the severity of the criminal activity in question and the type of evidence being sought affected how intrusive participants viewed different scenarios.<sup>172</sup>

In 2011, Henry Fradella and his colleagues sought to evaluate privacy attitudes by using a five-point Likert scale to determine whether participants agreed with or disagreed with Fourth Amendment precedent.<sup>173</sup> Like Slobogin and Schumacher, Fradella et al. found that participants generally had stronger views of privacy than the courts did.<sup>174</sup> But again, Fradella study's sample was not representative. The "overwhelming number" of the 589 participants were

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165. *Id.*

166. Slobogin & Schumacher, *supra* note 7.

167. *Id.* at 737.

168. *Id.* at 761.

169. *Id.* (discussing the two ways participants could have interpreted these questions).

170. Christopher Slobogin, *Public Privacy: Camera Surveillance of Public Places and the Right to Anonymity*, 72 MISS. L.J. 213, 276 (2002).

171. Christopher Slobogin, *Government Data Mining and the Fourth Amendment*, 75 U. CHI. L. REV. 317, 335 (2008).

172. Jeremy A. Blumenthal, Meera Adya & Jacqueline Mogle, *The Multiple Dimensions of Privacy: Testing Lay "Expectations of Privacy"*, 11 U. PA. J. CONST. L. 331, 344 (2009).

173. Henry F. Fradella et al., *Quantifying Katz: Empirically Measuring "Reasonable Expectations of Privacy" in the Fourth Amendment Context*, 38 AM. J. CRIM. L. 289, 342 (2011) (indicating participants could select among the following responses: strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree).

174. *Id.* at 362–66.



college students and faculty.<sup>175</sup> These sorts of studies simply substitute one unrepresentative group (the judiciary) for another.

More recently, studies have begun to use larger and more diverse samples to assess whether Supreme Court doctrine is consistent with society's attitude on privacy. Christine Scott-Hayward and her co-authors relied on 1,198 people recruited from Amazon Mechanical Turk ("MTurk"), an online crowd-sourcing marketplace.<sup>176</sup> The study sought to assess expectations of privacy in electronic information and see whether these attitudes supported the third party doctrine. They found that participants felt entitled to higher levels of privacy than the courts have provided and that their views were inconsistent with the third party doctrine.<sup>177</sup>

Although superior to convenience samples of students or local jurors, MTurk is still not representative of the U.S. population. Indeed, Kugler and Strahilevitz found that "MTurk respondents are significantly more privacy-protective than the general U.S. population, perhaps because they skew younger."<sup>178</sup> Consequently, they argued MTurk samples are not useful to assess the base-rate support for privacy-related beliefs in the general population, but they did suggest that such samples may be useful to evaluate the relative intrusiveness of different searches.<sup>179</sup> Such online samples are also useful for conducting randomized experiments that test for cognitive biases like the ones we study here. In addition, with a large enough sample, it is also possible to reweigh responses to correspond to national demographics, as we did for our sample.

In a similar vein, Alison Smith et al. modeled their case on Fradella's method, but used Survey Monkey to recruit a pool of 1,008 participants.<sup>180</sup> Smith provided the participants with five short vignettes describing police use of technology to investigate criminal activity.<sup>181</sup> The researchers then gave the participants several statements expressing different potential points of view about the vignettes and asked them whether they agreed or disagreed with the statements using a five-point Likert scale.<sup>182</sup> With respect to many specific scenarios, Smith's results confirmed what Fradella found.

Smith's study used richer scenarios that more closely resemble the facts courts actually encounter. However, her claims of using a "nationally

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175. *Id.* at 342. Participants were solicited in two ways: through an email invitation to students and faculty at eleven colleges and universities and through Facebook. *Id.* at 346.

176. Christine S. Scott-Hayward, Henry F. Fradella & Ryan G. Fischer, *Does Privacy Require Secrecy? Societal Expectations of Privacy in the Digital Age*, 43 AM. J. CRIM. L. 19, 51–52 (2015).

177. *Id.* at 58.

178. Kugler & Strahilevitz, *supra* note 25, at 233 n.113.

179. *Id.*

180. Alisa Smith, Sean Madden & Robert P. Barton, *An Empirical Examination of Societal Expectations of Privacy in The Digital Age of GPS, Cell Phone Towers, & Drones*, 26 ALB. L.J. SCI. & TECH. 111, 127–29 (2016).

181. *Id.*

182. *Id.* at 127.

representative respondent sample” appear to be overstated.<sup>183</sup> For example, women and African Americans are both significantly overrepresented in Smith’s sample (as compared to U.S. Census data), making up 54.6 percent and 25.0 percent of the sample, respectively.<sup>184</sup> Our study found that African Americans are significantly more protective of their privacy. Accurate population estimates would thus require reweighting of the studied sample, an adjustment that is not apparent in Smith’s methods.

Finally, Kugler and Strahilevitz have conducted two studies on the Fourth Amendment. In their first study, using a survey firm called Toluna, they recruited 1,461 participants to mirror the demographics of the U.S. population along several dimensions.<sup>185</sup> Their study focused on a narrow, albeit important, issue: whether the Supreme Court’s so-called “mosaic theory” was consistent with the public’s privacy views. Rooted in *Jones*, mosaic theory suggests that relatively short-term GPS monitoring of a person’s movements might be permissible under the Fourth Amendment, but longer-term monitoring “impinges on expectations of privacy.”<sup>186</sup> The study showed that the public disagreed with mosaic theory. In fact, “a large majority of Americans always expect privacy in their geolocation information, a meaningful minority never expect privacy, and only a tiny remnant allow their expectations to depend on surveillance duration.”<sup>187</sup> More recently, Kugler and Strahilevitz conducted another survey at different points in time to test whether expectations of privacy are circular.<sup>188</sup> In other words, they sought to determine whether Supreme Court decisions change privacy expectations.<sup>189</sup> Although they found that attitudes changed soon after a Supreme Court decision, those effects disappeared after a year or two. The authors concluded that privacy expectations are more stable than many predict.<sup>190</sup>

### III.

#### METHODOLOGY

We conducted an online survey experiment asking 1,200 participants to evaluate the reasonableness of eighteen different investigative actions. Thirteen are investigative actions that the government is already conducting or is expected to conduct in the near future, but whose status as a search the Supreme Court has not yet resolved. In addition, participants were also asked to answer questions on

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183. *Id.* at 114.

184. *Id.* at 130–31.

185. Kugler & Strahilevitz, *supra* note 25, at 245–46.

186. *United States v. Jones*, 565 U.S. 400, 430 (2012) (Alito, J. concurring).

187. Kugler & Strahilevitz, *supra* note 25, at 209–10.

188. Kugler & Strahilevitz, *The Myth of Fourth Amendment Circularity*, *supra* note 77, at 1776.

189. *Id.* at 1752 (discussing that under the “circularity” theory, expectations of privacy drive Supreme Court precedent, but many legal thinkers suspect that Supreme Court precedent also drives the public’s expectations of privacy).

190. *Id.* at 1794.

five scenarios on which the Supreme Court has already ruled.<sup>191</sup> These five scenarios replicate some of Slobogin and Schumacher's findings and also allow us to compare our findings with the views of the Supreme Court.

For each scenario, we asked participants to answer two questions, which served as our primary dependent variables. First, like Slobogin and Schumacher, we asked participants to rate each scenario based on the level of intrusiveness using a scale from 1 to 100.<sup>192</sup> Second, we asked participants to answer whether the actions described in each scenario violated "reasonable expectations of privacy" with a simple "yes" or "no." We believe that the second question corresponds more closely to the ultimate Fourth Amendment question courts have posed and allows us to make more direct comparisons to the doctrinal holdings. To avoid ordering effects, the scenarios were presented to participants in random order.

For each of these scenarios, we performed two randomized manipulations in between-subjects design, as shown in Table 1 (and more extensively in Appendix A). First, we asked some participants to assess the scenarios from the first person perspective and others to do so from the third person perspective. In other words, we wrote different versions of the same scenario as if it were happening to the person answering the survey (i.e., first person) or another person (i.e., third person). Second, we manipulated both the instructions and questions to test for outcome bias. In one condition, we told participants that the police were looking for incriminating evidence, but that the subject of the search was innocent. This version of the instructions tracked how courts frame the legal standard for determining reasonable expectations of privacy.<sup>193</sup> In our second condition, we told participants that while the subject of the search must be presumed innocent, in fact "the police found evidence of criminal activity."

We intended for these two manipulations together to reveal whether decision making based on the way judges typically assess reasonable expectations of privacy in the real world (third person/outcome) yields different results than the way judges are told to make these assessments based on Supreme Court jurisprudence (first person/no evidence).

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191. Slobogin used this technique in one later study. Slobogin, *supra* note 171, at 333–34 (The five baseline scenarios tracked established precedent, covering searches of bedrooms, searches of cars, pat-downs or frisks, a brief stop for purposes of obtaining identification, and a stop at a roadblock).

192. Slobogin was kind enough to provide us a copy of his original survey.

193. *United States v. Drayton*, 536 U.S. 194, 202 (2002) (quoting *Florida v. Bostick*, 501 U.S. 429, 437–38 (1991)) ("The reasonable person test . . . is objective and 'presupposes an *innocent* person.'").

Table 1. Text Manipulations by Experimental Conditions (2x2 Design)

	<b>First Person</b>	<b>Third Person</b>
<b>No Evidence of Crime</b>	Would it violate <u>your</u> reasonable expectations of privacy if the conduct described in the preceding statement occurred?	Would it violate a <u>person's</u> reasonable expectations of privacy if the conduct described in the preceding statement occurred?
<b>Evidence of Crime</b>	Would it violate <u>your</u> reasonable expectations of privacy if the actions described in the preceding statement <u>were used to obtain evidence that you committed a crime?</u>	Would it violate a <u>person's</u> reasonable expectations of privacy if the actions described in the preceding statement <u>were used to obtain evidence that the person committed a crime?</u>

We collected other demographic information, such as political party identification, which can be used as a covariate. We also asked about past experience with law enforcement of participants as well as their family and close friends. To avoid biasing their answers to the privacy questions we asked participants about their experience with law enforcement after they had answered all the other questions. Moreover, they were not allowed to go back to revise their earlier answers.

We used the Qualtrics platform to recruit participants. Although not a probability sample of the U.S. population, Qualtrics recruits participants nationwide from diverse panels of persons who have opted in to receiving such requests to participate in surveys for compensation. We specified that the firm would recruit at least half of the sample from populations other than non-Hispanic Whites. By surveying more African Americans and Hispanics in particular, we hoped to generate sufficient statistical power to assess whether these groups had different views about privacy or police conduct than Whites may have, thus making an advance on prior studies.

One thousand two hundred (1,200) participants completed our survey. We report the demographic breakdown of these participants across each experimental condition in Appendix B. Randomization succeeded in distributing these covariates across experimental conditions. With eighteen scenarios per respondent, we have 21,600 observations across the four experimental conditions.

Our study included 770 participants that identified as White, 207 as African American, 31 as American Indian, 99 as Asian, 8 as Pacific Islander, and 85 as other. Hispanic ethnicity was asked as a separate question, as in the U.S. Census. Across all the races, 263 participants also identified as Spanish/Hispanic/Latino, including 170 who identified as Whites. As compared to the national census, our

participants were more female, contained more minorities, and were politically more democratic. To approximate national attitudes nonetheless, we reweighted answers based on U.S. Census data (and, in the case of politics, national survey data).<sup>194</sup> The additional calculations did not change our results significantly. Nonetheless, we report the reweighted data.

#### IV. RESULTS

Figure 1 below illustrates the reweighted data with respect to violations of reasonable expectations of privacy for each scenario. For each scenario, we plotted responses based on the first person/no evidence version (the hypothetical perspective set out by the Supreme Court) in black and the third person/evidence version (the perspective from which most such decisions are actually made) in red. Each vertical line corresponds to a 95% confidence interval with the point representing the mean response.<sup>195</sup>

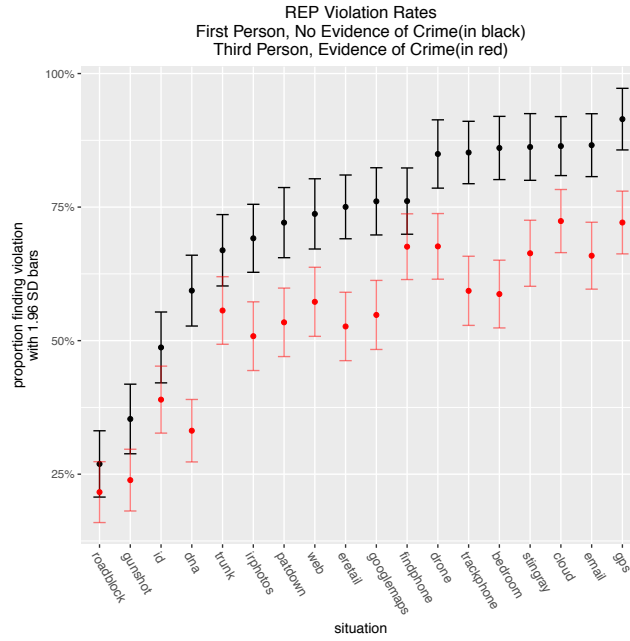
For examples of how to interpret this data, observe the black dot in the top right corner, which shows that almost all of the respondents found that GPS tracking violated their reasonable expectations of privacy and especially so when asked about themselves as an innocent person. On the other hand, less than a quarter of respondents found a privacy violation in the roadblock of a guilty third party (the red dot in the lower left corner). We further illustrate these effects in our discussion of each result.

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194. The weighting was carried out using multiple iterative proportional fitting as implemented in the R package. Johan Barthelemy, Thomas Suesse & Mohammad Namazi-Rad, *CRAN—Package mipfp*, COMPREHENSIVE R ARCHIVE NETWORK (Dec. 1, 2016), <https://CRAN.R-project.org/package=mipfp> [<https://perma.cc/W9DH-3VDM>] (R package version 3.0-1). The demographic target proportions rounded to two places are as shown in Appendix B. These proportions were condensed from U.S. demographic proportions to capture subgroups in the sample with distinct response patterns, while avoiding excessive numbers of cells with low populations. For details of the target weights, see Appendix B.

195. The variance computation uses variance decomposition and the delta method for estimating the variance of the weight matrix. See Hao Lu & Andrew Gelman, *A Method for Estimating Design-Based Sampling Variances for Surveys with Weighting, Poststratification, and Raking*, 19 J. OFFICIAL STAT. 133, 138 (2003). The empirical variance in cells with few respondents was estimated using the maximum sample variance in the remaining cells. *Id.*

Figure 1. Proportion of Respondents Finding Reasonable Expectations of Privacy Violated for Each of 18 Scenarios Split by Experimental Condition (with 95% Confidence Intervals)



### A. Biases

We performed a mixed logistic regression analysis to isolate how different variables affected outcomes in general. Our analysis found statistically significant evidence of both outcome bias and self-interest bias. Figure 1 plots the combined effect. Still, using regression models shown in Appendix C, we first examined the biases separately and focused on outcome bias. When participants were told that the police found incriminating evidence, the odds of finding that the conduct violated a person's reasonable expectation of privacy were 2.44 times less than when they were simply told that the subject of the search was innocent ( $p < .0001$ ).

We can gain an intuitive understanding of this effect by analyzing the infrared photo scenario. In that scenario, we asked participants whether police taking infrared images of a house to determine whether some surfaces (walls and roof) are hotter than others violated reasonable expectations of privacy. In the third person/no evidence version of this scenario, we found that 62.7% of the population believed that such conduct violated reasonable expectations of privacy. When we told participants that evidence of crime was found, but the third person perspective was held constant, findings of a violation of reasonable

expectations of privacy dropped from 62.7% to 40.8%.<sup>196</sup> (This estimate is not shown in Figure 1, which blends across the two manipulations.)

The results from our own study may underestimate hindsight bias in the real world. In our “outcome” condition, we merely told participants that the police found evidence that a person/they committed a crime. We did not state what the evidence or the crime was. Outcome bias is likely to exist upon a continuum. More powerful evidence (e.g., guns) or evidence of a more heinous crime (e.g., a brutal murder) probably enhances the effect.<sup>197</sup> Thus, our experiment’s opaque outcome manipulation may understate the effect.

We also found first person bias, replicating Slobogin and Schumacher’s findings.<sup>198</sup> Additionally, our data provide some perspective on the degree of the effect first person bias has on decision making. When participants were asked questions about police conduct directed to another person (third party), they were 1.43 times less likely to find that the police conduct violated a person’s reasonable expectations of privacy than when their own privacy interests were at issue (first person) ( $p < .0010$ ). We can see how this effect played out in the roadblock scenario. When individuals were told that police conduct is directed at a third person instead of themselves, the absolute likelihood that a person will believe that conduct violates reasonable expectations of privacy dropped by 6.4% to 20.5%, a relative decrease of 23.8%.

As described earlier, judges typically decide cases with the knowledge of incriminating evidence *and* in the third person. Thus, in the real world, the question concerns the combined effect of these two biases. For example, in the DNA scenario, we asked whether it violated reasonable expectations of privacy for police to take DNA from a disposable coffee cup a person used at a police station. In the third person/evidence version, on average 33.1% of the population found that such conduct violated reasonable expectations of privacy. However, that number nearly doubled to 59.4% in the first person/no evidence version of that scenario. In other words, attitudes changed sufficiently so that activity that would not be categorized as a search under one frame (the one most courts actually use) would be categorized as a search in a different frame (the one courts say they should use). Of course, for this illustration, we chose the DNA scenario precisely because the two different versions were on opposite sides of the 50% threshold. These results suggest that the decision-making biases in the Fourth Amendment context are sufficiently significant that they may change the results

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196. The odds ratio reflects how outcome bias impacted scenarios generally. Therefore, our calculation does not precisely match the numbers from Table 1, which reflect how the bias affected each individual scenario.

197. See Segal & Woodson, *supra* note 126, at 23–24 (observing that judges are affected by the seriousness of the crime when making Fourth Amendment decisions for more intrusive searches); Avani Mehta Sood, *Cognitive Cleansing: Experimental Psychology and the Exclusionary Rule*, 103 GEO. L. J. 1543, 1571–73 (2015) (finding that lay participants were more likely to find evidence admissible when the underlying crime was more egregious).

198. Slobogin & Schumacher, *supra* note 7, at 759–61.

in close cases. Moreover, it is these close cases where judges are likely to be the most vulnerable to the unconscious biases that we identify here. To avoid these biases, we recommend that judges rely on surveys instead of their own intuitions to resolve these Fourth Amendment questions.

*B. By Scenario*

Table 2 shows the results for the first person, no outcome version of each scenario. The first column includes the wording of each scenario as given to the survey participants. The second column indicates what percentage of the survey participants answered “yes” to the question of whether the described actions would violate the participants’ reasonable expectations of privacy. The final column lists the mean “intrusiveness score” on a scale of 1 to 100, which the participants assigned the actions in each scenario.

The table lists the scenarios according to the percentage of participants who ranked the actions as violating their reasonable expectations of privacy. Note that the ranking would have been very similar had the results been ordered by intrusiveness rating. As one would expect, for the most part the scenarios that more participants believed were a violation of their reasonable expectations of privacy were the same scenarios that received higher intrusiveness ratings.

Table 2. Scenarios with Percent of Respondents Finding Violations of Reasonable Expectations of Privacy and Average Intrusiveness Rating (1-100 scale) in First Person No-Outcome Condition

Scenario	% Finding Violation	Average Intrusiveness
Roadblock - Police stopping you at a roadblock for fifteen seconds to ask you questions.	27%	37
Gunshot - Police using a system of GPS-enabled microphones in public locations to detect and locate the sound of gunshots. The system automatically stores sounds for two seconds before and four seconds after a gunshot.	35%	50
ID - Police stopping you on the street to ask you for identification.	49%	52
DNA - Police obtaining your DNA from a disposable coffee cup you use at the police station.	59%	55
Infrared Photos - Police taking images of your house using an infrared device to determine whether some surfaces (walls and roof) of your house are hotter than others.	70%	64
Trunk - Police looking through the trunk of your car on a public street.	67%	66
E Retail - Police obtaining, from online retailers, all of the goods and services you have bought online.	75%	67



Google Maps - Police obtaining data from Google that reflects your precise location as you use Google Maps on your smartphone.	76%	68
Pat-down - Police stopping you on the street and patting down your outer clothing to feel for weapons.	72%	68
Web - Police obtaining data from a website operator that reflects the name, email address, telephone number, and physical address you entered when you opened an account on the website.	74%	68
Dropped Phone - Police finding your smartphone, which you dropped on a public sidewalk, and examining the pictures and videos stored on it.	76%	71
Track Phone - Police determining your smartphone's movements for a period of seven months by obtaining, from a cellular provider, information from the cellphone towers.	85%	73
Bedroom – Police searching your bedroom.	86%	73
Email - With help from your internet service provider, Police monitoring where and who you send emails to as well as how much data is sent, with help from your internet service provider.	87%	74
Stingray - Police using a device that pretends to be disguised as a cell phone tower to determine the location of your cell phone and record the content of any messages or calls made near the device.	86%	77
Drone - Police flying a drone equipped with a camera over your backyard at a height of sixty feet.	85%	78
Cloud - Police obtaining photos, documents, emails, and the names, addresses, and phone numbers of your contacts that you have stored in the Cloud.	86%	78
GPS - Police attaching a GPS to the bottom of your vehicle and tracking the vehicle for twenty-eight days.	91%	80

This ordinal ranking allows us to compare the views of the survey participants (reweighted to fit national demographics) with the views of the Supreme Court for those scenarios upon which the Supreme Court has specifically ruled. We included six scenarios that the Court has addressed precisely to allow for this comparison: police use of a roadblock;<sup>199</sup> asking for identification;<sup>200</sup> taking infrared images of a house;<sup>201</sup> searching the trunk of a car;<sup>202</sup> conducting a weapons pat-down;<sup>203</sup> and searching a bedroom.<sup>204</sup> In every case, the Supreme Court held that the police conduct *did* constitute a search or seizure. That is, in each of these six scenarios, the Court concluded that the police

199. See, e.g., *City of Indianapolis v. Edmond*, 531 U.S. 32 (2000).

200. See, e.g., *Brown v. Texas*, 443 U.S. 47 (1979).

201. See, e.g., *Kyllo v. United States*, 533 U.S. 27 (2001).

202. See, e.g., *Chambers v. Maroney*, 399 U.S. 42 (1970).

203. See, e.g., *Terry v. Ohio*, 392 U.S. 1 (1968).

204. See, e.g., *Wong Sun v. United States*, 371 U.S. 471 (1963).

conduct violated the subject's reasonable expectations of privacy. That included the roadblock scenario, which our survey respondents considered the least intrusive upon privacy by a clear margin. In other words, if the Supreme Court treated even a roadblock as a violation of reasonable expectations of privacy, then a fortiori they should include every other scenario as a violation of reasonable expectations of privacy. To hold otherwise would be inconsistent with the societal expectations that the standard of reasonable expectations purports to reflect, at least according to our survey.

The other scenarios we tested include uses of technology by the police—such as tracking a person's cell phone using information from the cell phone provider and police obtaining information stored in the Cloud—that the Supreme Court would *not* consider searches under the third party doctrine. The results of our study therefore provide compelling evidence that applying the third party doctrine to digital information, such as cell phone location information and information stored on the Cloud, would be inconsistent with society's reasonable expectations of privacy. This finding—that individual expectations of privacy do not support the third party doctrine—reinforced the findings of previous recent studies and with a more robust and representative survey methodology.

Moreover, we can make deeper comparisons between the Supreme Court's views and those of our survey respondents. The Supreme Court does not treat all searches and seizures as equally intrusive upon privacy. Some searches and seizures are more intrusive upon reasonable expectations of privacy than others. Sometimes, the Court expressly has stated that one privacy intrusion is greater than another, such as searching a house versus searching an automobile.<sup>205</sup> In other cases, we can deduce the relative degrees of intrusion by what the Court requires in order for each type of search to conform with the Fourth Amendment. The most intrusive searches and seizures—such as those involving entry into the home—must be supported by a warrant based on probable cause. But some classes of searches and seizures require less exacting justification, including (in descending order of exactitude) probable cause without a warrant; reasonable suspicion; and neutral guidelines without individualized suspicion. As we describe below, one of the factors (but not the only factor) that accounts for the kind of justification required to validate a search or seizure is the degree of privacy intrusion involved. We can therefore use the Court's determinations about what is required to justify a search or seizure to create a rough ranking of the Supreme Court's view about which searches and seizures are more intrusive than others. Then, we can see whether the Court's rankings align with those of our survey respondents—something that none of the previous empirical studies have done.

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205. See, e.g., *United States v. Martinez-Fuerte*, 428 U.S. 543, 561 (1976) (“[O]ne’s expectation of privacy in an automobile and of freedom in its operation are significantly different from the traditional expectation of privacy and freedom in one’s residence.”).

We therefore outline below the Court's analysis of the six search and seizure scenarios upon which it has ruled, described in descending order of the degree of intrusiveness the Court's analysis has suggested.

*i. Police searching your bedroom.*

The Supreme Court has regularly reiterated that a person's expectations of privacy are at their greatest with respect to physical intrusions into the person's home. For example, the Court asserted in *Payton v. New York*<sup>206</sup> that: "The Fourth Amendment protects the individual's privacy in a variety of settings. In none is the zone of privacy more clearly defined than when bounded by the unambiguous physical dimensions of an individual's home."<sup>207</sup> The preeminence of privacy within the home is grounded in both the text of the amendment (which expressly refers to the security of persons' houses<sup>208</sup>) and the Court's assertion that the "physical entry of the home is the chief evil against which the wording of the Fourth Amendment is directed."<sup>209</sup> Hence, the Court treats "the sanctity of a [person's] home"<sup>210</sup> as "the archetype of the privacy protection secured by the Fourth Amendment,"<sup>211</sup> and a warrant based on probable cause is required for both searches and seizures inside a home.<sup>212</sup>

*ii. Police taking images of your house using an infrared device*

The Court held in *Kyllo v. United States*<sup>213</sup> that "the use of a thermal-imaging device aimed at a private home from a public street to detect relative amounts of heat within the home constitutes a 'search' within the meaning of the Fourth Amendment."<sup>214</sup> The Court explained that the Government violates the residents' reasonable expectations of privacy when it "uses a device that is not in general public use, to explore details of the home that would previously have

206. 445 U.S. 573 (1980) (declaring that a New York statute permitting warrantless entry into a home with probable cause to arrest violated the Fourth Amendment).

207. *Id.* at 589.

208. *See, e.g., id.* at 589–90 (quoting *Silverman v. United States*, 365 U.S. 505, 511 (1961)) ("That language unequivocally establishes the proposition that 'at the very core of the Fourth Amendment stands the right of a man to retreat into his own home and there be free from unreasonable governmental intrusion.'").

209. *Id.* at 585 (quoting *United States v. U.S. District Court*, 407 U.S. 297, 313 (1972)).

210. *Boyd v. United States*, 116 U.S. 616, 630 (1886).

211. *Payton*, 445 U.S. at 587 (quoting *Dorman v. United States*, 435 F.2d 385, 389 (1970)); *see also Kyllo v. United States*, 533 U.S. 27, 34 (2001) (describing the interior of homes as "the prototypical and hence most commonly litigated area of protected privacy"); *City of Indianapolis v. Edmond*, 531 U.S. 32, 54 (2000) (Rehnquist, C.J., dissenting) (stating that "a person's body and home [are the] areas afforded the greatest Fourth Amendment protection"); *Florida v. Royer*, 460 U.S. 491, 515 (1983) (describing a "private residence" as the place "where reasonable expectations of privacy perhaps are at their greatest").

212. *Payton*, 445 U.S. at 586 (quoting *Coolidge v. New Hampshire*, 403 U.S. 443, 477–478 (1971)) (asserting that "[i]t is a 'basic principle of Fourth Amendment law' that searches and seizures inside a home without a warrant are presumptively unreasonable").

213. 533 U.S. 27 (2001).

214. *Id.* at 29.

been unknowable without physical intrusion.”<sup>215</sup> Such a search is treated on the same footing as a physical intrusion<sup>216</sup> and therefore is also “presumptively unreasonable without a warrant”<sup>217</sup> supported by probable cause.

*iii. Police looking through the trunk of your car on a public street*

The Court has repeatedly held that searching the interior of a vehicle (including the trunk) is a search that requires probable cause, but that in general does not require a warrant.<sup>218</sup> The Court recognized that exigent circumstances apply because “the car is movable, the occupants are alerted, and the car’s contents may never be found again if a warrant must be obtained.”<sup>219</sup> More fundamentally, the Court also based its holding—that a vehicle search is reasonable with probable cause but “without the extra protection for privacy that a warrant affords”<sup>220</sup>—on its belief that people have a “lesser expectation of privacy in a motor vehicle.”<sup>221</sup> Similarly, the Court in *United States v. Martinez-Fuerte*<sup>222</sup> stated that “[o]ne’s expectation of privacy in an automobile and of freedom in its operation are significantly different from the traditional expectation of privacy and freedom in one’s residence.”<sup>223</sup>

*iv. Police stopping you on the street and patting down your other clothing to feel for weapons*

The Supreme Court addressed the constitutional status of “stop and frisks” in the seminal case of *Terry v. Ohio*.<sup>224</sup> In *Terry*, the Court held that a stop and frisk in public was both a search and a seizure under the Fourth Amendment. The Court declared:

It must be recognized that whenever a police officer accosts an individual and restrains his freedom to walk away, he has “seized” that person. And it is nothing less than sheer torture of the English language to suggest that a careful exploration of the outer surfaces of a person’s

215. *Id.* at 40.

216. *See, e.g., id.* at 37 (“The Fourth Amendment’s protection of the home has never been tied to measurement of the quality or quantity of information obtained.”); *id.* at 40 (quoting *Payton*, 445 U.S. at 590) (citation omitted) (“We have said that the Fourth Amendment draws ‘a firm line at the entrance to the house.’ That line, we think, must be not only firm but also bright—which requires clear specification of those methods of surveillance that require a warrant.”).

217. *Id.*

218. *See, e.g., California v. Acevedo*, 500 U.S. 565, 580 (1991) (“The police may search an automobile and the containers within it where they have probable cause to believe contraband or evidence is contained.”); *Chambers v. Maroney*, 399 U.S. 42 (1970); *Carroll v. United States*, 267 U.S. 132 (1925).

219. *Chambers*, 399 U.S. at 51.

220. *Id.* at 50.

221. *Cardwell v. Lewis*, 417 U.S. 583, 590 (1974).

222. 428 U.S. 543 (1976).

223. *Id.* at 561; *see also City of Indianapolis v. Edmond*, 531 U.S. 32, 55 (2000) (Rehnquist, C.J., dissenting) (referring to “[t]he lowered expectation[s] of privacy in one’s automobile”).

224. 392 U.S. 1 (1968).

clothing all over his or her body in an attempt to find weapons is not a “search.”<sup>225</sup>

In other words, a stop and frisk intrudes upon reasonable expectations of privacy, dignity,<sup>226</sup> and freedom of movement. However, the Court also stated that because the intrusiveness of a stop and frisk was less than that of “a ‘technical arrest’ or a ‘full-blown search,’”<sup>227</sup> a warrant based on probable cause was not required.<sup>228</sup> Instead, the Court balanced the government interest in conducting the search and seizure against the “constitutionally protected interests of the private citizen,”<sup>229</sup> with “the scope of the particular intrusion . . . a central element in the analysis of reasonableness.”<sup>230</sup> Since a stop and frisk “may realistically be characterized as something less than a ‘full’ search, even though it remains a serious intrusion,”<sup>231</sup> the Court concluded that reasonable suspicion (a lesser standard than probable cause) was the appropriate standard for justifying the police conduct.<sup>232</sup> That is, a stop and frisk is permitted under the Fourth Amendment “[w]hen an officer is justified in believing that the individual whose suspicious behavior he is investigating at close range is armed and presently dangerous to the officer or to others.”<sup>233</sup>

*v. Police stopping you on the street to ask you for identification*

A police officer stopping someone on the street to ask for identification is a temporary seizure under the Fourth Amendment. *Terry* established that a stop on a public street requires reasonable suspicion. In *Brown v. Texas*,<sup>234</sup> the Supreme Court held specifically that such a stop accompanied by a demand for identification was an unreasonable seizure because the officers involved lacked “reasonable suspicion, based on objective facts, that the individual [was] involved in criminal activity.”<sup>235</sup>

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225. *Id.* at 16.

226. *Id.* at 17 (stating that a stop and frisk “is a serious intrusion upon the sanctity of the person, which may inflict great indignity and arouse strong resentment”).

227. *Id.* at 19.

228. *Id.* at 20 (“[W]e deal here with an entire rubric of police conduct—necessarily swift action predicated upon the on-the-spot observations of the officer on the beat—which historically has not been, and as a practical matter could not be, subjected to the warrant procedure.”).

229. *Id.* at 21.

230. *Id.* at 19 n.15.

231. *Id.* at 26.

232. The *Terry* Court describes the reasonable suspicion standard in the following terms:

“The officer need not be absolutely certain that the individual is armed; the issue is whether a reasonably prudent man in the circumstances would be warranted in the belief that his safety or that of others was in danger.” *Id.* at 27. The Court also made clear that the reasonable suspicion standard may be met “even though there is no probable cause to make an arrest.” *Id.* at 22.

233. *Id.* at 24.

234. *Brown v. Texas*, 443 U.S. 47 (1979).

235. *Id.* at 51.

*vi. Police stopping you at a roadblock for fifteen seconds to ask you questions*

A roadblock constitutes a seizure under the Fourth Amendment. That is, a reasonable person subjected to such a roadblock would not feel free to leave. As a seizure, the roadblock and detention must be reasonable, but what constitutes reasonableness depends on the *purpose* of the temporary detention. If a roadblock is set up in an emergency situation— for example, “to thwart an imminent terrorist attack or to catch a dangerous criminal who is likely to flee by way of a particular route”<sup>236</sup>—then “the Fourth Amendment would almost certainly permit [it].”<sup>237</sup> In the absence of such exigent circumstances, however, a roadblock for ordinary law enforcement purposes—such as attempting to intercept narcotics traffickers—“can only be justified by some quantum of individualized suspicion.”<sup>238</sup> That quantum of individualized suspicion is reasonable suspicion.<sup>239</sup>

However, if the roadblock is set up for a purpose other than the ordinary needs of law enforcement, such as to ensure road safety<sup>240</sup> or to detect undocumented immigrants,<sup>241</sup> then even individualized (i.e., reasonable) suspicion is not required. Instead, “where a Fourth Amendment intrusion serves special governmental needs, beyond the normal need for law enforcement, it is necessary to balance the individual’s privacy expectations against the Government’s interests.”<sup>242</sup> This standard is met by, for example, a fixed immigration checkpoint roughly in the vicinity of the nation’s border<sup>243</sup> and a sobriety checkpoint at which officers do not have discretion about which motorists to stop.<sup>244</sup> In each of these decisions, the Supreme Court justified allowing suspicion-less stops on the basis, *inter alia*, that “the measure of the intrusion on motorists stopped briefly at sobriety checkpoints . . . is slight.”<sup>245</sup>

Table 3. Summary of Supreme Court Doctrinal Requirements for Justifying a Valid Search

Scenario	Supreme Court Requirement for Valid Search
Roadblock	Neutral guidelines/criteria (individualized suspicion not required)

236. *City of Indianapolis v. Edmond*, 531 U.S. 32, 44 (2000).

237. *Id.*

238. *Id.* at 47.

239. *See Adams v. Williams*, 407 U.S. 143 (1972).

240. *See, e.g., Michigan Dep’t of State Police v. Sitz*, 496 U.S. 444 (1990).

241. *See, e.g., United States v. Martinez-Fuerte*, 428 U.S. 543 (1976).

242. *Sitz*, 496 U.S. at 449.

243. *See, e.g., Martinez-Fuerte*, 428 U.S. at 543.

244. *See, e.g., Sitz*, 496 U.S. at 453.

245. *Id.* at 451.

Street stop for ID / Pat-down for weapons	Reasonable suspicion (individualized)
Search trunk of car	Probable cause (warrant not required)
Infrared images of house	Probable cause and a warrant
Search of bedroom	

The survey results for many of the individual scenarios conflict with the Supreme Court's historical judgments on the same police conduct. This disparity is apparent when comparing the Supreme Court's determinations of the scenarios' relative intrusiveness with our study's determinations of the same scenarios' relative intrusiveness.

First, the survey participants consider a pat-down for weapons on a public street to be more intrusive than a search of the trunk of a car on a public street.<sup>246</sup> This runs counter to the Supreme Court's approach. As described in Table 3, a trunk search requires probable cause,<sup>247</sup> whereas a pat-down for weapons requires only reasonable suspicion. This is likely due to the greater privacy intrusion (according to the Court) when searching a car trunk than when conducting a weapons pat-down.<sup>248</sup> The results of earlier surveys accord with the Court's approach rather than with the results of our survey. In earlier surveys, respondents viewed the search of a trunk to be a greater privacy intrusion than a pat-down for weapons.<sup>249</sup>

Second, the data shows that the survey participants consider many of the "technology" searches to be more intrusive than other actions that the Supreme Court has not only held to violate reasonable expectations of privacy, but has held to involve the *greatest* violation of reasonable expectations of privacy. This can be seen from Table 4 below, which combines the survey results in Table 2 with the Supreme Court's rankings in Table 3. Table 4 also shows whether a lower court (for scenarios upon which the Supreme Court has not yet ruled) has held that the described action violates a reasonable expectation of privacy and, if so, what degree of justification the investigators required in order for the search to be valid under the Fourth Amendment.

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246. See *supra* Table 1.

247. *California v. Acevedo*, 500 U.S. 565, 580 (1991) ("The police may search an automobile and the containers within it where they have probable cause to believe contraband or evidence is contained.").

248. See *Terry v. Ohio*, 392 U.S. 1, 27 (1967) (requiring reasonable suspicion of criminal activity and possession of a weapon).

249. See, e.g., *Slobogin & Schumacher*, *supra* note 7, at 738.

Table 4. Comparison of Respondent Perceptions and Supreme Court Requirements by Experimental Scenario

Scenario	Respondents' Intrusiveness Rating (avg.)	Reasonable expectations of privacy recognized in judicial holding?	Requirements/justification for valid search
Roadblock	36.7	Yes	Neutral criteria/guidelines
Gunshot detection	49.9	?	<i>Not yet determined</i>
Street stop for ID	51.7	Yes	Reasonable suspicion
DNA – coffee cup	55.4	No	No REP, so no justification
Infrared images	63.4	Yes	Probable cause and warrant
Trunk of car	65.7	Yes	Probable cause
E-retail information	67.3	?	<i>Suggested by Justice Sotomayor</i>
Google maps	68.0	?	<i>Suggested by Justice Sotomayor</i>
Pat-down	68.1	Yes	Reasonable suspicion
Web site operator	68.1	No	No REP, so no justification
Dropped phone	70.5	No	No REP, so no justification
Track Phone	72.9	?	<i>Circuit split</i> <sup>250</sup>
Bedroom search	73.1	Yes	Probable cause and warrant
Email recipients	73.8	No	<i>No REP, according to Circuit Court</i> <sup>251</sup>
Stingray – location, messages, calls	77.0	?	<i>Probable cause and warrant, according to District Court</i> <sup>252</sup>
Drone – backyard	77.5	?	<i>Not yet determined</i>
Cloud	77.6	?	<i>Not yet determined</i> <sup>253</sup>

250. Compare *United States v. Skinner*, 690 F.3d 772, 780 (6th Cir. 2012) (holding that tracking a criminal suspect for three days using cell tower information did not constitute a search), *United States v. Davis*, 785 F.3d 498 (11th Cir. 2015), and *United States v. Carpenter*, 819 F.3d 880 (6th Cir. 2016) (holding that obtaining cellular location information did not constitute a search), with *United States v. Graham*, 796 F.3d 332 (4th Cir. 2015) (finding that collecting two weeks of cellular location information constituted a search).

251. *United States v. Forrester*, 512 F.3d 500, 504 (2008) (“[C]omputer surveillance that enabled the government to learn the to/from addresses of his e mail messages . . . did not constitute a search. . .”).

252. *United States v. Lambis*, 197 F. Supp. 3d 606, 611 (S.D.N.Y. 2016) (“The use of a cell-site simulator constitutes a . . . search . . . Absent a search warrant, the Government may not turn a citizen’s cell phone into a tracking device.”).

253. *But see United States v. Davis*, 785 F.3d 498, 530 (2015) (Rosenbaum, J., concurring) (“As for documents that we store in the Cloud, our privacy interest there is the same as that recognized in documents and other items maintained in a rented office or residence, or a hotel room during a paid visit.



GPS - track vehicle	79.5	?	<i>Not decided in U.S. v. Jones</i> <sup>254</sup>
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As we noted above, even the action with the lowest intrusiveness rating—brief questioning at a roadblock—intrudes upon a person’s reasonable expectations of privacy, according to Supreme Court precedent.<sup>255</sup> In other words, survey participants consider every one of the “technology searches” to be more intrusive of privacy than actions that the Court has held does violate reasonable expectations of privacy. Similarly, survey participants consider all but one of the technology searches (gunshot detection) to be more intrusive than being stopped on the street and asked for identification, which the Court has held is a temporary seizure that requires reasonable suspicion.

This comparison of the survey results also provides further support for the contention—made by Justice Sotomayor in *United States v. Jones* and by numerous scholars—that the Court should not apply the third party doctrine to technology searches. Two of the questions in the survey were based on scenarios that Justice Sotomayor pointed out are *not* violations of reasonable expectations of privacy *at all* under the third party doctrine. However, in our study, survey participants consider these two scenarios—police obtaining information about your online retail purchases and police obtaining your location information from Google Maps—to be more intrusive than full-blown searches requiring probable cause (and, in one case, a warrant).

Additionally, survey participants consider tracking a person’s movements by using cellular towers to be more intrusive than a physical pat-down, which the Supreme Court has classified as a search. The former issue is currently pending before the Supreme Court in *Carpenter v. United States*.<sup>256</sup> Our data also suggest that ordinary people view the police’s conduct in this case as violating their reasonable expectations of privacy, suggesting that it should be classified as a search.

Finally, survey participants consider five of the technology searches to be the most intrusive of all the study’s scenarios. All five of these—Stingray

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As discussed previously, the Supreme Court has plainly recognized as reasonable under the Fourth Amendment the privacy interest in effects held in such places . . . The privacy expectation has not abraded simply because the effect to be searched is virtual and the ‘place’ of storage is now the intangible Cloud.”)

254. *United States v. Jones*, 565 U.S. 400, 412–13 (2012) (“We may have to grapple with these ‘vexing problems’ [about when GPS tracking violates reasonable expectations of privacy] in some future case where a classic trespassory search is not involved and resort must be had to *Katz* analysis; but there is no reason for rushing forward to resolve them here.”). *But see* *United States v. Maynard*, 615 F.3d 544 (D.C. Cir. 2010) (holding that installation and monitoring of a GPS device constitutes a search); *Tracey v. State*, 152 So. 3d 504 (Fla. 2014) (holding that real-time tracking of a suspect using her cell phone on public roads constitutes a search).

255. *See Michigan Dep’t of State Police v. Sitz*, 496 U.S. 444 (1990).

256. *United States v. Carpenter*, 819 F.3d 880 (6th Cir. 2016), *cert. granted*, 137 S. Ct. 2211 (June 5, 2017) (No. 16-402).

devices, drones, obtaining emails, accessing the Cloud, and GPS tracking—were considered more intrusive than a police search of one’s bedroom, the quintessential violation of privacy that requires justification by probable cause and a warrant. Given the Court’s assertions that the definition of a search reflects what society considers to be an intrusion into reasonable expectations of privacy, these five investigative actions should be held to be searches requiring the presence of probable cause and a search warrant. Interestingly, according to the data, the most intrusive search of all the scenarios presented was tracking a vehicle using a GPS device—which is precisely the question the Supreme Court declined to decide in *United States v. Jones*.

### C. Other Significant Factors

This part discusses race, experience with law enforcement, political leanings, age, income, and sex as predictors for whether individuals will find privacy violations. To the extent that the judiciary suffers from these same demographic associations and is not demographically representative of the population, these data explain why doctrine may evolve away from the public’s reasonable expectations of privacy.

#### 1. Race and Experience with Law Enforcement

Using a regression analysis, we analyzed whether participants’ responses differed based on race. Our primary finding was that those who identified as White were less sensitive to police conduct than those who identified as African American. On average, Whites found that 10.7 out of 18 scenarios violated reasonable expectations of privacy.<sup>257</sup> African Americans found violations 12.3% more often, or an average of 2.21 additional scenarios in the slate of 18 ( $p < .001$ ). Compared to Whites, individuals that identified as “other” race were 13.2% more likely to find a violation (2.38 additional scenarios on average) ( $p < .001$ ).

The prior literature suggested that Hispanics’ privacy attitudes might also differ from Whites’, but we did not see such differences in our results, even though we had strong statistical power to detect even small effects.<sup>258</sup> No other minorities (American Indians/Alaskan Natives, Asian/Native Hawaiians, or Other Pacific Islanders) showed statistically significant differences.

Additionally, we found interesting differences with the way experience with law enforcement affected Whites and African Americans. Whites who had been the subject of a police search were more sensitive to police conduct.<sup>259</sup> But

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257. See Race/Experience Model found in Appendix C.

258. In one context, others have reported that Hispanics were “over three times more likely to believe that a warrant was necessary.” Smith et al., *supra* note 180, at 137 (for tracking cell phone use information).

259. We asked participants to check a box if the following statement applied to them: “The police have NEVER searched me or my property.” In our study, 202 out of 770 White respondents (26.2%)

the same effect was not seen in African Americans. Specifically, Whites who said that they had been the subject of a police search found privacy violations 9.2% more often (1.65 additional scenarios on average) than White respondents who did not have this experience ( $p < .001$ ), controlling for all other covariates. In contrast, African Americans who had been the subject of a police search in the past were not more sensitive to privacy violations than African American respondents who did not have such an experience. If anything, the data trended slightly in the opposite direction.<sup>260</sup>

We also asked participants whether they or their close friends or family members had been the subject of a police investigation. The results were similar. When participants or their close friends or family members had been the subject of a criminal investigation, White respondents found 9.26% (1.67 scenarios) more violations of privacy than Whites without any of these experiences ( $p < .001$ ).<sup>261</sup> Not surprisingly, the effect was more pronounced when we focused on Whites who had been personally the subject of a criminal investigation. They found 12.5% more scenarios (2.26 scenarios) to violate reasonable expectations of privacy ( $p < .001$ ).<sup>262</sup> But again, for both these analyses, we did not see similar results with African Americans. Indeed, our results trended in the opposite direction, but they were not statistically significant.

These results suggest that one factor affecting privacy views of police conduct is past experiences with police. But race complicates the story. For Whites, such individual experiences appear to make them more concerned about privacy. However, African Americans are already more concerned about police conduct than their White counterparts. These attitudes may be because the African American community as a whole has different views of police than Whites do. It may be that, perhaps because of the higher rate of pat-downs, arrests, and prison time for African Americans—and the sense that these experiences with the criminal justice system are in significant part *because* of their race—the attitudes resulting from police interaction are promulgated throughout African American communities.<sup>263</sup> That is, it may be that, regardless of whether African Americans or their friends or family have had direct experiences with the police, they generally (and understandably) have attitudes

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and 49 out of 207 African American respondents (23.6%) did not check a box (i.e., they have been searched).

260. In other words, African Americans who had personal experiences with police searches were actually less likely to find that certain scenarios violated reasonable expectations of privacy. Our regression analysis found that African Americans who had been searched found that the scenarios violated reasonable expectations of privacy 5.91% less often (1.06 fewer scenarios). But these findings were not statistically significant ( $p = .124$ ).

261. Here, 167 out of 770 White respondents (21.7%) and 62 out of 207 African American respondents (30.0%) reported that they, a close friend, or family member had been the subject of a criminal investigation within the last ten years.

262. We found that 79 White respondents out of 770 (10.3%) and 17 African Americans out of 207 (8.21%) had been the subject of a criminal investigation in the last ten years.

263. See *supra* notes 143–47 discussion and sources.

towards the police akin to that of White individuals who have had direct experiences with the police. While our data is certainly consistent with this hypothesis, our study cannot explain why experiences with police affect the privacy views of Whites and African Americans in different ways.

### 2. *Political Leanings*

Our analysis of political leanings showed that individuals who prefer Republicans are less likely to find violations of reasonable expectations of privacy. We asked participants to place themselves on a seven-tiered scale. One end was “I strongly prefer the Democrats,” and the other end was “I strongly prefer the Republicans.” For every step in the conservative direction, participants found 1.90% (0.34 out of 18 scenarios) fewer violations of reasonable expectations of privacy ( $p < .0001$ ). This result suggests that individuals who strongly prefer Republicans will find that 11.4% less scenarios violate reasonable expectations of privacy than those who strongly prefer Democrats.

These findings are consistent with those of Fradella et al. and Smith et al. Fradella found that “Republicans express lower levels of support for the protection of privacy than Democrats.”<sup>264</sup> More narrowly, Smith found that Democrats were more likely to expect privacy for cell phone data.<sup>265</sup> Conversely, Kugler and Strahilevitz did not find that political orientation affected people’s view on GPS surveillance, while Scott-Hayward et al. found that independents had higher expectations of privacy for location information than either Republicans or Democrats.<sup>266</sup>

### 3. *Age*

We found that an individual’s age also had some ability to explain a person’s privacy views. A standard linear regression failed to yield statistically significant results. However, modeling age using a quadratic function (i.e., similar to a parabola) was consistent with the results of our survey ( $p < .05$ ).<sup>267</sup> This model predicts that participants at the middle of our age range will find more violations of privacy than both younger and older people.

Figure 2 depicts our age model and gives an intuitive sense of these findings. The model predicts that people at forty-one years old find the most violations of privacy; they found that 65.6% more scenarios violated reasonable expectations of privacy (11.8 out of 18 scenarios). However, both younger and older people were less concerned about privacy. Our model predicts that our

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264. Fradella et al., *supra* note 173, at 368.

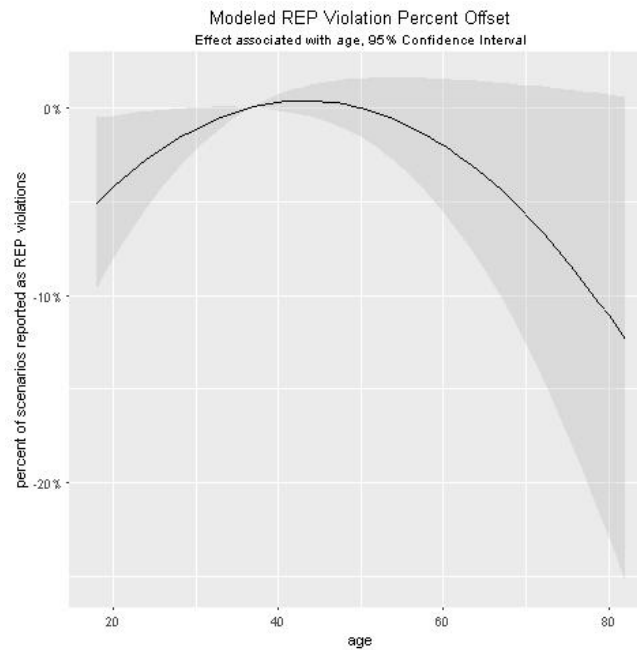
265. Smith et al., *supra* note 180, at 138.

266. Kugler & Strahilevitz, *supra* note 25, at 255; Scott-Hayward et al., *supra* note 176, at 58.

267. See Appendix C, Table C2 Age Model. At first, we tried modeling age using a linear function. Examination of a residual plot from that model suggested that expectations of privacy were higher for those in the middle age range. Accordingly, we used a quadratic function to model the data and that was a better fit.

youngest population will find a very small reduction in the number of scenarios that violate reasonable expectations privacy. Individuals eighteen years of age are predicted to find that 4.5% fewer scenarios (.81 out of 18 scenarios) violate reasonable expectations of privacy. However, our model shows slightly larger effects as people age. For example, seventy-year-olds are predicted to find that 7.2% (1.3 out of 18 scenarios) fewer scenarios violate reasonable expectations of privacy.<sup>268</sup>

Figure 2. Average Number of Scenarios Found to Violate Reasonable Expectations of Privacy as a Quadratic Function of Age



Kugler and Strahilevitz also found modest age effects. They noted that those with the lowest privacy expectations in the geolocation context were significantly older than other groups (6.42 years older).<sup>269</sup> It is unclear whether we can reconcile these different studies using a parabolic model like the one we use above.

As a point of reference, consider that fifty is the average age at which U.S. federal magistrate judges are appointed.<sup>270</sup> These judges are often tasked with resolving procedural questions, including motions to suppress evidence in

268. The sparseness of the points in the higher age range reflects the absence of participants in certain ages.

269. Kugler & Strahilevitz, *supra* note 25, at 252.

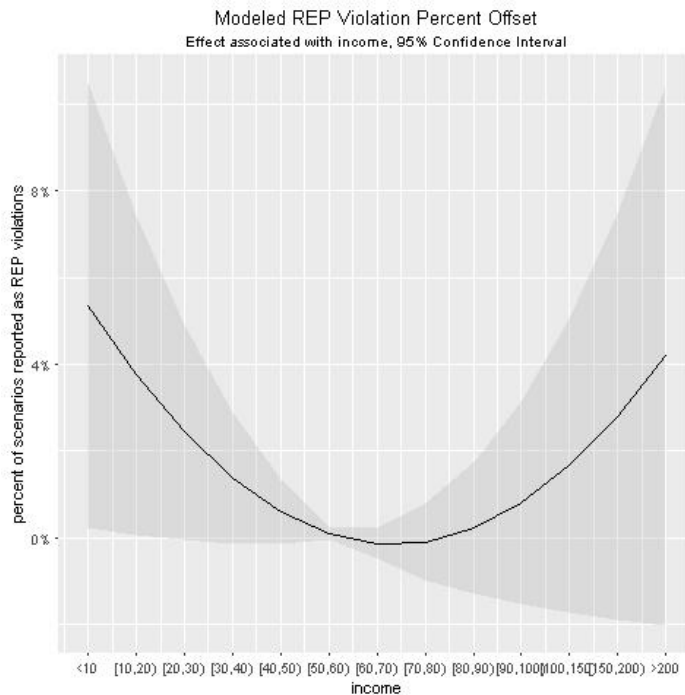
270. See *Appointments of Magistrate Judges—Judicial Business 2012*, U.S. COURTS, <http://www.uscourts.gov/statistics-reports/appointments-magistrate-judges-judicial-business-2012> [<https://perma.cc/3FER-5PTB>].

criminal cases. Most states have mandatory retirement ages.<sup>271</sup> Federal judges, of course, have life tenure and other incentives to continue on the bench in “senior status,” which skews the judiciary’s age upwards.<sup>272</sup> It is thus unsurprising that judicial doctrine skews away from the perceptions of a younger population.

#### 4. Income

We also found that an individual’s income had some ability to explain a person’s privacy views. Again, a standard linear regression failed to yield statistically significant results. However, modeling income using a quadratic function was more consistent with our survey results ( $p < .05$ ).<sup>273</sup> This model predicts that participants at the middle-income range will find fewer violations of privacy than both poorer and wealthier people.

Figure 3. Average Number of Scenarios Found to Violate Reasonable Expectation of Privacy as a Quadratic Function of Income



271. See *Arizona Proposition 115: What Courts/States Have Mandatory Judicial Retirement and at What Age?*, GAVEL TO GAVEL (Feb. 12, 2013), <http://gaveltogavel.us/2012/10/11/arizona-proposition-115-what-courts-states-have-mandatory-judicial-retirement-and-at-what-age> [<https://perma.cc/84NG-432M>] (noting that thirty-two states and the District of Columbia have age limits for at least some of their judges).

272. See generally *Life Tenure for Federal Judges Raises Issues of Senility, Dementia*, PRO PUBLICA (Jan. 11, 2012, 7:30 AM), <https://www.propublica.org/article/life-tenure-for-federal-judges-raises-issues-of-senility-dementia> [<https://perma.cc/VU4T-NW84>].

273. See Appendix C, Table C2 Income Model.

Figure 3 depicts our income model. Our model predicts that people with incomes between \$60,000 and \$89,999 will consider 11.2 of our 18 scenarios (62.2%) to violate reasonable expectations of privacy. However, as income diminishes to less than \$10,000 (zero on our income scale), our model suggests that such individuals will find 7.2% (1.3 out of 18 scenarios) more of our scenarios to violate reasonable expectations or privacy. To a lesser extent, the same is true for individuals who are higher on the income ladder. Figure 3 shows that our model predicts that individuals that earn over \$200,000 (12 on our income scale) will find 3.9% more scenarios (.7 out of 18 scenarios) violate their expectations of privacy.

Smith et al. found that lower income respondents were more likely to believe that an individual had an expectation of privacy in relation to data stored on their cell phones.<sup>274</sup> It is unclear whether these results are consistent with our parabolic model.

#### 5. Sex

Men were generally more likely to find privacy violations than women, in a substantial effect with size comparable to that of being African American or viewing the case in the first person perspective.<sup>275</sup> We also examined gender interactions with every individual scenario, and identified one contrary scenario – the body pat-down – in which women were more likely to find privacy violations.<sup>276</sup> As noted above, women tend to be underrepresented in the state and federal judiciary.<sup>277</sup> Thus, if judges also suffer from these sex-associated attitudes, doctrine may be biased towards privacy generally but against privacy findings in body pat-down situations.

### V.

#### LIMITATIONS AND RECOMMENDATIONS

##### A. Limitations

Our study had several methodological limitations. Before reviewing those, it is important to acknowledge our conceptual focus on the threshold question of whether police conduct constitutes a search or seizure. Our study does not directly address the question of whether a search or seizure is ultimately reasonable, a distinct question under Supreme Court doctrine (even though it also turns on a conception of reasonableness).

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274. Smith et al., *supra* note 180, at 138.

275. See Appendix C, Table C1 (showing that the odds of men finding privacy violations were 1.474 times that of women ( $p = 0.0008$ ), compared to African Americans (1.639) or those in First Person condition (1.429)).

276. See *id.* (showing odds of 1.729 ( $p = 0.0004$ )).

277. See *supra* notes 147–149 discussion.

First, we used short and very abridged statements for our experimental stimulus, providing respondents with less contextual information than judges have when they decide analogous questions in a litigated case. The condensed stimulus allowed us to utilize a randomized, controlled, and experimental design, which is the gold standard for scientific research, and allowed us to study a wide range of scenarios. These focused vignettes also allowed us to avoid other extraneous and potentially biasing information (e.g., the suspect's race or the particular crime under investigation), which could confound our results. Nonetheless, it is possible that respondents would have different views about the scenarios and the biases we observed could have different magnitudes, if we introduced additional information. Because we did not specify these other variables, respondents may have made their own assumptions, which we do not observe.

Second, we did not study the actual judges who make judicial decisions. For the purposes of determining whether these police practices do violate reasonable expectations of privacy, we argued in Section II. D above that the legal doctrine actually requires such an inquiry into the perceptions of ordinary Americans. However, we also use our data to critique current judicial practice. Our data show that cognitive bias infects privacy assessments when decided from hindsight and from the third-person perspectives which judges presently employ. It would take an inferential step from the biases documented in our sample to the population of judges for this to suggest a problem in our current judicial practice. Prior work with actual judges makes this inference quite reasonable.<sup>278</sup> It is possible, nonetheless, that judges are not subject to the same cognitive biases as other humans are.<sup>279</sup>

Third, although we took care to recruit a sample that represented certain U.S. demographic profiles based on the U.S. Census and further reweighted the sample to approximate the U.S. population, we did not use a true probability sample (such as random digit dialing). In particular, it is likely that our online sample includes more active Internet users than the U.S. population at large, and this may affect their perceptions of police practices involving technology.

Fourth, although we can infer causation from our randomly-assigned variables (hindsight and third person biases), which hold constant all observable and non-observable differences, we can only speak in terms of association for the naturally-occurring variables (such as respondent demographics). For the latter associations that we observe, we use multivariate regressions to adjust for other observed covariates, but we cannot rule out the possibility that non-observed variables cause these associations. For example, although we see females are more privacy protective in the domain of body pat-downs, it may be that victims of sexual assault are more sensitive, and this non-observed

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278. See *supra* notes 114, 117.

279. See *supra* notes 118–30 and accompanying text.



characteristic is more common among females. This is a standard limitation of cross-sectional research.

### B. Policy Recommendations

We have five primary findings relevant to policy. First and most importantly, generally members of the U.S. public have greater concerns for privacy than are reflected in current judicial doctrine. Second, current judicial doctrine includes several relative judgments—e.g., giving no protection to emails held by an internet provider, but the strongest available Fourth Amendment protection to a bedroom—that do not reflect actual expectations of privacy in the United States. Third, the ubiquitous practice of judgment in hindsight (i.e., with knowledge that the search has found evidence of crime) strongly decreases the likelihood that participants would find violations of reasonable expectations of privacy. Fourth, the ubiquitous practice of developing Fourth Amendment doctrine by resolving criminal defendants' suppression motions (in the third person) also decreases the likelihood of finding a violation. Fifth, Whites and older persons (beyond age forty-one)—i.e., those who dominate the judiciary—are less likely to find that police investigative practices invade privacy.

In principle, the five distinct findings could yield as many, or more, policy reform recommendations. For example, first, to address our race findings, we recommend reform of the judiciary so that the population of judges deciding Fourth Amendment questions might reflect the demographics of the U.S. population at large (if not the population of those most often subject to police investigations). Especially in state courts, judges are currently disproportionately White, which means that they are likely biased against finding police privacy violations, compared to the perceptions of the broader U.S. population. On the other hand, states are ahead of the federal judiciary in imposing mandatory retirement ages, which should mitigate the age-related biases that we document. Second, to address the conflict between current judicial doctrine and the actual expectations of privacy held by ordinary citizens, we recommend that the Supreme Court should hold that the third party doctrine does not apply to searches involving digital technology.<sup>280</sup>

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280. The Supreme Court is grappling with this very issue now in *Carpenter v. United States*. See *supra* note 256 and accompanying text. Moreover, two district courts reached different conclusions about whether the third party doctrine allows the National Security Agency to make a daily warrantless sweep of the public's metadata pursuant to an earlier incarnation of the Foreign Intelligence and Surveillance Act. Compare *Klayman v. Obama*, 957 F. Supp. 2d 1 (D.D.C. 2013) (finding government collection of telephony metadata constitutes a search), *vacated on other grounds*, 800 F.3d 559 (D.C. Cir. 2015), with *ACLU v. Clapper*, 959 F. Supp. 2d 724 (S.D.N.Y. 2013) (finding government collection of telephony metadata does not constitute a search because the third party doctrine applies), *rev'd on other grounds*, 785 F.3d 787 (2d Cir. 2015). The courts could also use the same kind of data for other issues that they are facing now. For example, applying the private search doctrine to different types of digital information has produced inconsistent results. There is currently a circuit split as to the proper application of the doctrine to computers and digital storage devices. See, e.g., *United States v. Ackerman*,

More generally, we recommend a solution for all five problems. If courts would rely on properly-constructed surveys to assess whether particular conduct violates reasonable expectations of privacy, then they could avoid the difficulties of speculating from their own racialized perspective in hindsight and in the third person. When the survey stimulus materials are properly constructed, this proposal has the benefit of eliminating both hindsight bias and third person bias. If the sample is constructed (or reweighted) to reflect the demographics of the U.S. population, then race and age biases can be resolved as well. Finally, this approach substitutes reliable evidence for judicial speculation, aligning judicial doctrine about privacy with the actual views of the public that is to be governed by that doctrine.<sup>281</sup> It is worth emphasizing that judicial use of reliable empirical evidence does not involve a departure from the current doctrinal approach, and therefore it requires no additional normative justification. As we described in detail in Section I.D, the courts already peg the definitions of searches and seizures to ordinary beliefs; they just do so while relying on their personal speculation and intuitions about what those ordinary beliefs are, instead of accurate and reliable empirical data.<sup>282</sup> On the other hand, science is no panacea—it must be done well, be free of bias, and be interpreted properly.<sup>283</sup>

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831 F.3d 1292, 1306–07 (10th Cir. 2016) (finding government investigators conducted an illegal search when they opened files not previously viewed by a third party); *United States v. Lichtenberger*, 786 F.3d 478, 491 (6th Cir. 2015) (finding police conducted an illegal search when they viewed files on a device in addition to the files previously viewed by a private party); *United States v. Sparks*, 806 F.3d 1323, 1335 (11th Cir. 2015) (finding police conducted an illegal search when they viewed images and videos on a storage device in addition to the files on the device that were previously viewed by a third party); *Rann v. Atchison*, 689 F.3d 832, 838 (7th Cir. 2012) (finding police did not conduct a search when a private party had viewed some files on a zip drive, even though the police opened and viewed additional files on the zip drive that the private party had not viewed); *United States v. Runyan*, 275 F.3d 449, 464 (5th Cir. 2001) (holding that police did not conduct a search when a private party had viewed some files on CDs, even though the police opened and viewed additional files on the CDs that private party had not viewed).

281. In principle, aligning judicial doctrine with actual views of privacy could involve either increasing Fourth Amendment protections, where actual views of privacy are stronger than the Supreme Court's historical judgments, or decreasing Fourth Amendment protections, where actual views of privacy are weaker than the Court's judgments. However, at least with respect to the scenarios we tested, the results indicated that actual views of privacy were either stronger than, or consistent with, the Court's doctrinal judgments. Even the scenario that had the lowest intrusiveness responses among those we tested—the police roadblock—was considered a privacy intrusion by more than one-quarter of the survey respondents. *See supra* Section IV.B. This is consistent with the Supreme Court's holding that a police roadblock is a Fourth Amendment seizure, but one involving a relatively minor intrusion on the motorist and consequently requiring a relatively minor justification. *Michigan Dep't of State Police v. Sitz*, 496 U.S. 444 (1990) (holding that sobriety checkpoints intrude upon a motorists' privacy, but are reasonable under the Fourth Amendment even in the absence of individualized suspicion provided that they are administered according to non-discretionary procedures).

282. It is also worth noting that, in utilizing empirical data on reasonable expectations of privacy, the courts are not ceding their ultimate judgment on whether law enforcement practices violate the Fourth Amendment. The courts would still, *inter alia*, decide whether or not law enforcement practices considered intrusive by ordinary citizens are *reasonable* and therefore permissible under the Fourth Amendment.

283. *See generally* FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (3d ed. 2011) (guiding judges on how to interpret scientific evidence and survey data in particular); Christopher

## CONCLUSION

Our experiment replicated some of the best features from prior work and improved on them in several ways. First, we started with a large (1,200 participants) and demographically diverse sample. Instead of drawing participants to mirror the U.S. population, we intentionally oversampled minorities, which allowed statistically reliable estimates for their distinctive perceptions of privacy. This is important because police investigations tend to fall disproportionately on these populations. Nonetheless, we also reweighted our sample to reflect the U.S. Census, allowing accurate society-wide estimates. We tested a mix of long-established police activities and cutting-edge technological investigative techniques. Finally, we replicated and improved on prior studies of third-person and hindsight biases.

Together, our findings suggest that judicial speculation is a poor substitute for evidence. If the judiciary continues to craft doctrine about police invasions of privacy that is untethered to the actual expectations of the populace, it risks a crisis of legitimacy for both the police and the judiciary.

## APPENDIX A. EXPERIMENTAL MANIPULATIONS

Respondents received the following instructions, with manipulations by experimental condition shown.

**Instructions: 1st Person/No Evidence of Crime.**

The purpose of this study is to examine people's attitudes on various types of police actions. Below are 18 scenarios involving police actions. Assume in each case that the police are looking for evidence of criminal activity and that:

- (1) you have not engaged in criminal activity—that is, you **are innocent of any criminal wrongdoing**—and are not planning any crime;
- (2) you are presumed innocent of any criminal wrongdoing; and
- (3) you have **not consented** to the police action.

Please rate each scenario in terms of “**intrusiveness**” that is, how intrusive you think each police action is, using a scale of 1 to 100. “1” means not intrusive at all, and “100” means extremely intrusive, while a “50” means moderately intrusive, and so on.

Then please tell us whether you believe that the actions described in the scenario would violate your reasonable expectations of privacy.

**Instructions: 1st Person/Evidence of Crime: Substitute instruction 1 below.**

- (1) the police found evidence of criminal activity by you, but

**Instructions: 3rd Person/No Evidence of Crime**


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Tarver Robertson, *Blind Expertise*, 85 N.Y.U. L. REV. 174 (2010) (discussing partisan bias in expert testimony and solutions to the problem).

The purpose of this study is to examine people's attitudes on various types of police actions. Below are 18 scenarios involving police actions. Assume in each case that the police are looking for evidence of criminal activity and that:

- (1) the target of the actions has not engaged in criminal activity—that is, the person is **innocent of any criminal wrongdoing**—and is not planning any crime;
- (2) the person is presumed innocent of any criminal wrongdoing; and
- (3) the person **did not consent** to the police action.

Please rate each scenario in terms of “**intrusiveness**” that is, how intrusive you think each police action is, using a scale of 1 to 100. “1” means not intrusive at all, and “100” means extremely intrusive, while a “50” means moderately intrusive, and so on.

Then, please tell us whether you believe that the actions described in the scenario would violate your reasonable expectations of privacy.

**Instructions: 3rd Person/Evidence of Crime: Substitute instruction 1 below.**

- (1) the police found evidence of criminal activity by a person, but

#### APPENDIX B. DEMOGRAPHICS AND REWEIGHTING

Table B displays demographics and successful random assignment. The furthest right-hand column shows our targets for reweighting responses. The footnotes for this table indicate the source of the U.S. population demographics found in the right-hand column

Table B. Demographics of Respondents by Experimental Condition and U.S. Population

	No Evidence		Evidence of Crime		U.S. Population
	1st Person (n = 301)	3rd Person (n = 300)	1st Person (n = 301)	3rd Person (n = 298)	
<b>Sex</b> <sup>284</sup>					
Female	59.5%	56.9%	62.5%	59.1%	50.8%
Male	40.5%	43.1%	37.5%	40.9%	49.2%
<b>Age</b> <sup>285</sup>					
18-34	47.2%	49.2%	49.5%	50.7%	30.6%
35-49	32.9%	33.7%	30.6%	35.9%	27.2%

284. U.S. Census Bureau *QuickFacts: United States*, U.S. CENSUS BUREAU, <https://www.census.gov/quickfacts/fact/table/US/PST045217> [https://perma.cc/4Z98-2TDB].

285. See U.S. CENSUS BUREAU, AGE AND SEX COMPOSITION: 2010 (2011), <https://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf> [https://perma.cc/J5JQ-RALK].

50-64	17.6%	12.1%	16.6%	10.7%	25.1%
Over 65	2.3%	5.1%	3.3%	2.7%	17.2%
<b>Ethnicity</b> <sup>286</sup>					
White	63.8%	64.3%	67.8%	60.7%	72.4 %
African American	17.9%	14.5%	16.6%	20.1%	12.6%
Native American	3.3%	3.7%	2.0%	1.3%	0.9%
Asian	7.6%	7.7%	8.0%	9.7%	4.8%
Pacific Islander	0.3%	1.3%	0.3%	0.7%	0.2%
Other	7%	8.4%	5.3%	7.4%	9.1%
<b>Hispanic</b> <sup>287</sup>					
Non-Hispanic	79.4%	78.8%	79.1%	75.2%	83.7%
Mexican origin	11.6%	11.1%	13.3%	14.8%	10.3%
Puerto Rican origin	2.7%	3.4%	4.3%	3.4%	1.5%
Cuban origin	1.0%	1.7%	0.7%	1.0%	0.6%
Other	5.3%	5.1%	2.7%	5.7%	4.2%
<b>Education</b> <sup>288</sup>					
Some School	3.7%	1.7%	1.7%	3.0%	13.7%
Graduated High School	17.9%	20.5%	20.9%	22.8%	31.0%
Some College	26.6%	25.6%	22.6%	27.2%	19.3%
Associate's Degree	14.0%	12.5%	12.6%	12.8%	8.6%
Bachelor's Degree	25.2%	25.3%	32.2%	23.2%	18.0%
Master's Degree	9.3%	10.1%	6.3%	6.4%	6.7%
Professional Degree	2.3%	3.4%	1.3%	3.7%	1.4%
PhD	1.0%	1.0%	2.3%	1.0%	1.2%
<b>Income</b> <sup>289</sup>					

286. See *id.*

287. See U.S. CENSUS BUREAU, THE HISPANIC POPULATION: 2010 (2011), <https://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf> [<https://perma.cc/2WWN-7U9L>].

288. See tables hyperlinked at *Educational Attainment in the United States: 2010*, U.S. CENSUS BUREAU (Nov. 16, 2016), <https://www.census.gov/data/tables/2010/demo/educational-attainment/cps-detailed-tables.html> [<https://perma.cc/UL47-PPQS>].

289. CARMEN DENAVAS-WALT & BERNADETTE D. PROCTOR, U.S. CENSUS BUREAU, INCOME AND POVERTY IN THE UNITED STATES: 2014 (2015), <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p60-252.pdf> [<https://perma.cc/6P66-E3WR>].

Under \$50,000	48.5%	44.8%	45.5%	47.7%	46.8 %
Over \$50,000	51.5%	55.2%	54.5%	52.3%	53.2%
<b>Politics</b> <sup>290</sup>					
Democrat	37.5%	34.7%	37.5%	40.6%	30% <sup>291</sup>
Leans Democrat	18.6%	16.8%	12.6%	14.8%	18%
Independent	20.3%	19.2%	22.3%	19.8%	1.0%
Leans Republican	8%	12.8%	12%	8.7%	14.0%
Republican	15.6%	16.5%	15.6%	16.1%	27.0% <sup>292</sup>

## APPENDIX C. REGRESSION MODELS

Table C1 shows the results of a regression analysis to find the odds ratio for variables of interest. The (Intercept) value corresponds to the odds of a violation in the reference case of a roadblock when all demographic and experimental variables are zero. Coefficients for values of categorical variables detailing the situation show the odds ratio if the situation in the case is changed to the given situation from the roadblock, but all else is unchanged. The ethnicity odds ratios are given relative to the category of “White.” The odds ratios for the binary variables show the results of changing the binary variable for Outcome from evidence of a crime to no crime, changing sex from Female to Male, changing from third person to first person, and changing each of the binary variables Hispanic, Searched, and Investigated Family from false to true. Coefficients for values of ordered variables show the odds ratio if the ordered variable is increased by one level, but all else is unchanged. The Pat-down Female coefficient is an interaction variable. The age effect is better fit by a quadratic, making the one year change uninformative.

Table C1. Regression Model with Individual Scenarios and Covariates

Variable	<i>p</i> value	Odds Ratio
(Intercept)	0.0000	0.123
Trunk	0.0000	11.817
GPS	0.0000	40.698
Bedroom	0.0000	19.758
ID	0.0000	3.461
Pat-down	0.0000	9.205

290. *Party Affiliation*, GALLUP NEWS, <http://www.gallup.com/poll/15370/party-affiliation.aspx> [https://perma.cc/79HK-TMLQ] (source at “2016 Jun 1–5”).

291. Matching both prefer and strongly prefer Democrats.

292. Matching both prefer and strongly prefer Republicans.

Track Phone	0.0000	19.389
Infrared Photos	0.0000	9.093
Web	0.0000	13.155
Cloud	0.0000	38.784
Email	0.0000	27.342
E Retail	0.0000	11.429
Dropped Phone	0.0000	17.560
Gunshot	0.0122	1.319
DNA	0.0000	4.336
Stingray	0.0000	33.997
Drone	0.0000	37.875
Google Maps	0.0000	12.786
Male	0.0008	1.474
Pat-down Female	0.0004	1.729
Age	0.6463	1.002
Age Quadratic	0.0317	0.999
African American	0.0016	1.639
Ethnic-Other	0.0165	1.417
Hispanic	0.2704	1.163
Education	0.1854	0.946
No Evidence of Crime	0.5459	0.989
Conservative	0.0001	0.886
No Outcome	0.0000	2.439
1st Person	0.0010	1.429
Searched	0.1271	1.236
Investigated Family	0.0058	1.497

Table C.2. Regression Models to Isolate Significant Predictors

Variable	Race/Search	Politics	Age	Income	All Model
No Evidence of Crime					2.28***
1st Person					.85**
Gender					.88**
Age			-.0022		.0051
Age-Quadratic			-.0015*		-.0015*
Education					-.14
Income				-.062	-.033

Income–Quadratic				.027*	.025*
Hispanic					.21
Conservative		-.34***			-.28***
Searched	1.65***				1.25**
African American	2.21***				1.96***
American Indian	1.46				.49
Asian	.37				.47
Pacific Islander	3.13				3.16
Other Race	2.38***				2.05**
Searched African American	-2.71**				-2.67**
Searched American Indian	-.77				-.058
Searched Asian	.57				-.27
Searched Pacific Islander	-1.11				-.45
Searched Race Other	-1.74				-1.88
Intercept	10.67***	12.38***	11.64***	11.89***	10.21***
Multiple R2	.04102	.01651	.0041	.005577	.1307
Adjusted R2	0.03214	.01569	0.002469	.003915	.1152

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

The dependent variable reflects how many of the eighteen scenarios the subject found violated reasonable expectations of privacy.

In the Race/Search regression model, we start with a white respondent who has not been the is  $21.5-11.48(\text{Income})+\text{Income}^2$ .

In the “all” model, we start with a non-Hispanic white female, where the question is framed in the third person with knowledge of the outcome (evidence of a crime). The person has not been the subject police investigation and the person’s family and close friends have not been the subject of a police investigation. Age is as above. Income is on a 0-12 scale, ranging from less than \$10,000 to \$200,000 or more. Education is on 2-8 scale, ranging from high school graduate to holder of a professional degree or doctorate. Political affiliation ranges from 0 = strongly prefer Democrats to 6 = strongly prefer Republicans.