
COMMENT

SUBOPTIMAL SOCIAL SCIENCE
AND JUDICIAL PRECEDENT

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INTRODUCTION

The social sciences have developed dramatically over the last century in both breadth and sophistication.¹ These disciplines offer systematic data collection and an analytic methodology to test our empirical intuitions about individual behavior and social institutions. Prior to the development of the social sciences and their application to the legal system, judges could rely only on their personal experiences and untested empirical intuitions when faced with complex questions of social fact.² A court's *exclusive* reliance on personal experience, however, "could continue only so long as its 'best guesses' about [empirical] facts were as good as . . . everyone else's."³ Today, social science research exists on a wide range of legal issues, and courts are faced with the challenge of resolving controversial questions of empirical fact on the basis of complex and sometimes conflicting scientific literatures. Courts have, for example, reviewed social science evidence on racial segregation,⁴ maximum work hours,⁵ First Amendment rights,⁶ jury size,⁷ the exclusionary rule,⁸ eyewitness identification,⁹ and child custody.¹⁰ Yet, despite efforts to encourage the integration of social science into the judicial process, and despite a modest increase in judicial reliance on social

¹ By social sciences, I refer broadly to a range of disciplines including psychology, economics, sociology, political science, anthropology, demography, and public policy.

² See David L. Faigman, "Normative Constitutional Fact-Finding": *Exploring the Empirical Component of Constitutional Interpretation*, 139 U. PA. L. REV. 541, 545 (1991) ("Historically, most constitutional fact-finding depended on the Justices' best guesses on the matter.").

³ *Id.* at 546 (footnote omitted); see also *id.* ("[I]f [Chief Justice] Marshall[, in *Gibbons v. Ogden*,] had been confronted . . . with a valid scientific study showing that America's understanding of commerce was not as broad as he supposed, the legitimacy of his conclusion would have been undermined.").

⁴ See, e.g., *Brown v. Bd. of Educ.*, 347 U.S. 483, 494 n.11 (1954) (relying, in part, on psychological research on the impact of segregation on African-American school children).

⁵ See, e.g., *Muller v. Oregon*, 208 U.S. 412, 419 n.1 (1908) (noting medical and social research regarding the effects of long working hours on women's health).

⁶ See, e.g., *Lee v. Weisman*, 505 U.S. 577, 593-94 (1992) (considering psychological research on the susceptibility of adolescents to peer pressure).

⁷ See, e.g., *Williams v. Florida*, 399 U.S. 78, 101 & nn.48-49 (1970) (discussing statistical research on whether jury size influences the verdict reached).

⁸ See, e.g., *United States v. Leon*, 468 U.S. 897, 907 n.6 (1984) (summarizing sociological research on the effect of the exclusionary rule on case outcomes).

⁹ See, e.g., *State v. Henderson*, 27 A.3d 872, 892-912 (N.J. 2011) (reviewing psychological research on the reliability of different eye witness identification procedures).

¹⁰ See, e.g., Sheila Rush Okpaku, *Psychology: Impediment or Aid in Child Custody Cases?*, 29 RUTGERS L. REV. 1117, 1142-44 (1976).

science evidence in recent decades,¹¹ courts remain reluctant to incorporate social science into their decisionmaking.¹²

In this Comment, I explore the role of social science in the development of common law precedent. I begin with the assumption that most judges and legal scholars today would support the use of social science in particular judicial decisions where the research findings are valid, replicated, consistent across studies, and directly applicable to the legal question at hand. I focus instead on the problem of suboptimal social science. In the vast majority of cases only suboptimal evidence is available—that is, evidence that is valuable but not completely valid, consistent, or directly applicable. Judges and legal scholars have long debated the benefits¹³ and

¹¹ See Murray Levine & Barbara Howe, *The Penetration of Social Science into Legal Culture*, 7 LAW & POL'Y 173, 178-85 (1985) (discussing an increase in the use of social science evidence by the Supreme Court from 1908 to 1983); Frederick Schauer & Virginia J. Wise, *Legal Positivism as Legal Information*, 82 CORNELL L. REV. 1080, 1108 (1997) (“[S]tarting in 1991, there has been a substantial and continuing increase in the [Supreme] Court’s citation of nonlegal sources.”).

¹² See Tracey L. Meares, *Three Objections to the Use of Empiricism in Criminal Law and Procedure—And Three Answers*, 2002 U. ILL. L. REV. 851, 853-54 (noting that the “penetration of the social science into legal areas” remains “shallow after all of these years”); see also Donald N. Bersoff & David J. Glass, *The Not-So Weisman: The Supreme Court’s Continuing Misuse of Social Science Research*, 2 U. CHI. L. SCH. ROUNDTABLE 279, 281 (1995) (noting the Supreme Court’s “long-standing ambivalence toward social science research”). This reluctance is perhaps even stronger in foreign courts. See Niels Petersen, *Avoiding the Common Wisdom Fallacy: The Role of Social Sciences in Constitutional Adjudication 2* (Max Planck Inst. for Research on Collective Goods, Paper No. 2011/22, 2011), available at <http://ssrn.com/abstract=1923012> (asserting that European courts are less receptive to the use of empirical studies when crafting constitutional law).

¹³ See, e.g., James R. Acker, *Social Science in Supreme Court Criminal Cases and Briefs: The Actual and Potential Contribution of Social Scientists as Amici Curiae*, 14 LAW & HUM. BEHAV. 25, 41 (1990) (arguing that social scientists should submit amicus briefs and cautioning that they should “help [judges] become familiar with . . . the limitations and proper interpretations of relevant research”); David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 EMORY L.J. 1005, 1025 (1989) (noting that social science provides “objective understanding derived through controlled systematic inquiry”); Carl E. Schneider & Lee E. Teitelbaum, *Life’s Golden Tree: Empirical Scholarship and American Law*, 53 UTAH L. REV. 53, 62-66 (2006) (declaring that the case for employing social science is “embarrassingly simple” because its use clearly adds to the knowledge of the decisionmaker); Peter W. Sperlich, *Postrealism: Should Ignorance Be Elevated to a Principle of Adjudication?*, 64 JUDICATURE 93, 95-96 (1980) (acknowledging the drawbacks of social science in judicial decisionmaking, but advocating its use as the best tool available); Christoph Engel, *The Difficult Reception of Rigorous Descriptive Social Science in the Law* 29-31 (Max Planck Inst. for Research on Collective Goods, Paper No. 2006/1, 2006), available at <http://ssrn.com/abstract=875797> (asserting that the use of social science reduces the risk of “materially wrong” decisions based on “mere introspection, or . . . the everyday experience the judge shares with all other members of society”). Similarly, Rosenblum writes,

[W]hen judges condition legal conclusions on contemporary community standards or prevailing custom or questions of whether a reasonable man would have reacted as did one of the parties in the case, or whether children who come from integrated schools feel and perform better than children who come from racially segregated

disadvantages¹⁴ of using this kind of limited empirical research in judicial decisionmaking. And litigants frequently argue that courts should not rely upon specific social science evidence because of limitations in the literature.¹⁵ Yet courts are given relatively little guidance on how to address suboptimal social science in the development of precedent.¹⁶

In Part I, I provide a brief history and typology of the uses of social science in the courts. I discuss the traditional distinction between adjudicative and legislative facts,¹⁷ as well as other conceptual developments proposed more recently by Monahan and Walker.¹⁸

In Part II, I survey many of the common limitations of *individual* studies, which scholars and litigants frequently use to argue that a court should ignore a particular scientific study in developing common law precedent. These limitations include methodological weaknesses and potential biases of the researchers. Given that “courts often cannot avoid basing legal rules on empirical assumptions,”¹⁹ I observe that the negative consequences of these limitations will reappear regardless of whether courts choose to rely on

schools, the courts should not be allowed to get by with visceral or subjective notions of how and why people believe as they do.

Victor Rosenblum, *A Place for Social Science Along the Judiciary's Constitutional Law Frontier*, 66 NW. U. L. REV. 455, 479 (1971).

¹⁴ See, e.g., *Craig v. Boren*, 429 U.S. 190, 204 (1976) (“[P]roving broad sociological propositions by statistics is a dubious business, and one that inevitably is in tension with the normative philosophy that underlies the Equal Protection Clause.”); Andrew Greeley, *Debunking the Role of Social Scientists in Court*, HUM. RTS., May 1978, at 34, 35 (arguing that social science should have only a minor role in judicial decisionmaking because social science “is not scientific the way other sciences are”); Philip R. Lochner, Jr., *Some Limits on the Application of Social Science Research in the Legal Process*, 1973 LAW & SOC. ORD. 815, 835-40 (describing factors limiting the judicial use of social science, such as institutional constraints and insufficient training); David M. O’Brien, *The Seduction of the Judiciary: Social Science and the Courts*, 64 JUDICATURE 8, 11, 17-21 (1980) (arguing that “judges should abandon the practice of justifying their decisions on the basis of empirical propositions”); Michael Rustad & Thomas Koenig, *The Supreme Court and Junk Social Science: Selective Distortion in Amicus Briefs*, 72 N.C. L. REV. 91, 119-52 (1993); cf. Erica Beecher-Monas, *Blinded by Science: How Judges Avoid the Science in Scientific Evidence*, 71 TEMP. L. REV. 55, 66-67 (1998) (asserting that many judges fail to assess the scientific validity of particular forms of evidence and, as a result, admit “so-called experts [who] are wrong as often as they are right”); Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1375-77 (1971) (arguing that the use of mathematical or probabilistic methods in court may undermine public confidence in the judicial system).

¹⁵ See *infra* notes 78-80, 94, 106, 149, and accompanying text.

¹⁶ But see John Monahan & Laurens Walker, *Empirical Questions Without Empirical Answers*, 1991 WIS. L. REV. 569, 578-81 (considering how courts should decide questions of common law precedent where no relevant empirical social science evidence is available).

¹⁷ See *infra* Section I.A.

¹⁸ See *infra* Sections I.B-C.

¹⁹ Monahan & Walker, *supra* note 16, at 581.

social science to ground their decisions in particular cases. Without guidance from social science on complex empirical questions, judges must rely on their own empirical intuitions formed through a process subject to the same set of limitations. Thus, limitations on social science studies should not presumptively preclude their use in the development of judicial precedent.

In Part III, I consider limitations on the value of social science to judicial precedent that inhere in larger *bodies of social science research* rather than individual studies. I focus on two limiting characteristics in particular: the size of the literature and the consistency of the results. Scholars and litigants have used these characteristics to argue that a court should ignore a scientific literature in resolving a question of precedent. They have argued, for example, that subsequent research may overturn current scientific theory, and that courts are ill equipped to assess social science research critically. I show that these limitations are often overstated and describe a number of common institutional mechanisms to address them. In addition, after noting the infeasibility of common solutions proposed by legal scholars, I suggest that existing permanent staff attorney positions in federal and state courts offer a unique and cost-effective method to bring social science expertise into the courthouse.

I. TYPOLOGY OF SOCIAL SCIENCE IN COURTS

In this first Part, I outline a typology of the various purposes for which courts use social science research, and discuss the relevant procedures for each of these uses. As I note below, the well-established rules that govern the admission of evidence at trial do not appear to apply to social science used to resolve questions of legal precedent. For good reasons, courts have significant discretion in receiving and obtaining social science evidence for this narrow purpose.

A. *Adjudicative and Legislative Facts*

Historically, the use of social science in the development of common law precedent posed a procedural complexity in American courts. As a general matter, judges answer questions of law, and juries answer questions of fact.²⁰ Factfinders are charged with weighing the evidence²¹ presented to the court.

²⁰ See DAVID P. LEONARD, *A NEW WIGMORE: A TREATISE ON EVIDENCE—SELECTED RULES OF LIMITED ADMISSIBILITY* § 1.2 (1997) (distinguishing the roles of the judge and jury).

²¹ See *id.* (noting that the jury “must weigh the value of the evidence it has been permitted to hear”).

Appellate courts may review trial court findings, but only if such findings are “clearly erroneous.”²² This does not mean, however, that appellate courts may not review evidence on their own. Federal judges are permitted to obtain facts independently (without admission into the record) if they are “not subject to reasonable dispute.”²³ These facts must be “generally known within the trial court’s territorial jurisdiction” or “can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned.”²⁴

These general principles of legal practice were challenged in *Muller v. Oregon*,²⁵ which scholars often cite as the first use of social science evidence in an American court.²⁶ In *Muller*, the owner of a laundry company challenged the constitutionality of a statute prohibiting women from working over ten hours per day in certain industries.²⁷ As counsel for the State, Louis Brandeis submitted a brief that described medical and social science studies finding a negative effect of long working hours on women’s health.²⁸ Though acknowledging that the underlying empirical studies were not, “technically speaking, authorities,”²⁹ the Court found that the “widespread and long continued belief” that the studies represented was “worthy of consideration.”³⁰

The use of social science evidence in *Muller* raised an evidentiary puzzle for legal practitioners and scholars: Brandeis submitted factual information to an appellate court through a brief.³¹ How could Brandeis introduce the social science evidence when facts must be established at the trial court through direct and cross-examination of witnesses?³² Kenneth Culp Davis provided an answer to this puzzle in a famous law review article that developed a typology of the different uses of social science in administrative and judicial decisionmaking.³³ Prior to the 1940s, legal authorities recognized two rough kinds of evidence: adjudicative facts and constitutional facts.³⁴

²² FED. R. CIV. P. 52(a)(6).

²³ FED. R. EVID. 201(b).

²⁴ *Id.*

²⁵ 208 U.S. 412 (1908).

²⁶ *E.g.*, John Monahan & Laurens Walker, *Judicial Use of Social Science Research*, 15 LAW & HUM. BEHAV. 571, 572 (1991). In this Section, I focus on federal law and evidentiary practice.

²⁷ 208 U.S. at 417.

²⁸ *Id.* at 419 & n.1.

²⁹ *Id.* at 420.

³⁰ *Id.* at 421.

³¹ *Id.* at 419.

³² *See* Monahan & Walker, *supra* note 26, at 572 (noting that “legal commentators were hard pressed to explain an apparent anomaly”).

³³ Kenneth Culp Davis, *An Approach to Problems of Evidence in the Administrative Process*, 55 HARV. L. REV. 364, 402-03 (1942). Davis focused on the role of science in administrative

Parties introduce evidence of adjudicative facts—concerning the actions or circumstances of immediate relevance to the litigation³⁵—through physical evidence or oral testimony to prove that some legal standard is or is not satisfied. The prosecution in a murder trial, for example, might introduce evidence that the defendant was apprehended with the blood of the victim on his hands. This adjudicative fact helps the jury to determine whether the defendant is guilty.

Legal authorities also recognize a second category of evidence: evidence introduced to prove constitutional facts.³⁶ Constitutional facts, usually social or economic statistics, are used not to prove certain facts about the events in controversy, but to inform the development of a constitutional rule.³⁷ The Brandeis brief, for example, introduced evidence of facts to justify a constitutional rule that maximum-hour labor restrictions were permissible.³⁸

Davis argued that constitutional facts were “only one manifestation of a larger category of facts which are utilized for informing a court’s legislative judgment on questions of law and policy.”³⁹ Courts rely on facts from this broader category—which Davis called “legislative facts”—to shape not only constitutional rules, but also legal precedent more generally.⁴⁰ For example, though DNA identification is an accepted form of forensic evidence today, prosecutors were often required to introduce evidence of its reliability to appellate courts when the technology was first introduced. In *United States v. Porter*, the prosecution moved to submit the results of a DNA analysis on semen collected from the victim and to submit evidence that the probability of a false match was one in thirty million.⁴¹ The court consolidated *Porter* with eleven similar cases for a hearing on the reliability of DNA evidence.⁴²

hearings, but his work has been widely extended to factual determinations by courts as well. For examples of cases in which courts have adopted Davis’s typology of scientific evidence, see *infra* note 45 and accompanying text.

³⁴ See Davis, *supra* note 33, at 403 (“The distinction between legislative and adjudicative facts apparently has been clearly recognized only in constitutional cases, in which a category of ‘constitutional facts’ has emerged.”).

³⁵ See *id.* at 402-03. (“When an agency finds facts concerning immediate parties—what the parties did, what the circumstances were, what the background conditions were—the . . . facts may conveniently be called adjudicative facts.”).

³⁶ *Id.* at 403.

³⁷ *Id.*

³⁸ *Muller v. Oregon*, 208 U.S. 412, 419 & n.1 (1908); see also Monahan & Walker, *supra* note 26, at 572 (“Brandeis assembled a substantial body of medical and social science research tending to show the debilitating effect on women and girls of working long hours, and presented this material to . . . defend[] Oregon’s limits on the number of hours females could be employed.”).

³⁹ Davis, *supra* note 33, at 404.

⁴⁰ *Id.* at 402-04.

⁴¹ 618 A.2d 629, 630 (D.C. 1992).

⁴² *Id.*

After hearing testimony from eight expert witnesses and viewing over 1300 pages of briefing,⁴³ the court held that the results of DNA identification were admissible, but that mathematical estimates of reliability at the time were inadmissible for lack of “consensus within the relevant scientific community.”⁴⁴

Courts have widely adopted Davis’s distinction between adjudicative and legislative facts,⁴⁵ at least partially because it explains how parties can submit social science evidence to appellate courts. There are good reasons for employing different procedures for the admission of adjudicative and legislative facts. First, stringent procedural requirements on the use of social science evidence to determine legislative facts would stunt the development of common law rules.⁴⁶ Second, cross-examination is not necessary in the context of legislative facts because the parties “have little or nothing to contribute to the development of legislative facts.”⁴⁷ Courts rely on legislative facts to develop rules or policies that will apply to all members of society, and, as such, the parties to a particular case have no unique interest in the precedent adopted.

Compared to the well-established procedures governing the admission of adjudicative facts at trial, the rules for legislative facts are less clear.⁴⁸ In

⁴³ *Id.*

⁴⁴ *Id.* at 631.

⁴⁵ See, e.g., *Nordlinger v. Hahn*, 505 U.S. 1, 11 (1992) (invoking the concept of “legislative facts” to adjudicate an equal protection claim); *Broz v. Schweiker*, 677 F.2d 1351, 1357 (11th Cir. 1982) (“The legislative/adjudicative fact distinction, first articulated by Professor Davis . . . has become a cornerstone of modern administrative law theory and has been widely accepted in the federal appellate courts.”), *vacated*, *Heckler v. Broz*, 461 U.S. 952 (1982); *State v. Erickson*, 574 P.2d 1, 5-6 (Alaska 1978) (stating that the distinction between adjudicative and legislative facts is at “least implicitly recognized in nearly every situation where a court has been called upon to address a question of policy in evaluating the rationality or reason behind a statute or rule”); *In re Guardianship of Doyle*, 778 N.W.2d 342, 348 (Minn. Ct. App. 2010). The Federal Rules of Evidence also recognize the distinction between adjudicative and legislative facts. See FED. R. EVID. 201(a) (specifying that the federal rule for judicial notice applies only to adjudicative facts and not to legislative facts).

⁴⁶ Davis wrote:

My opinion is that judge-made law would stop growing if judges, in thinking about questions of law and policy, were forbidden to take into account the facts they believe, as distinguished from facts which are . . . indisputable. Facts most needed in thinking about difficult problems of law and policy have a way of being outside the domain of the clearly indisputable.

Kenneth Culp Davis, *A System of Judicial Notice Based on Fairness and Convenience*, in *PERSPECTIVES OF LAW* 69, 82 (Roscoe Pound et al. eds., 1964) (internal quotation marks omitted).

⁴⁷ KENNETH CULP DAVIS, *ADMINISTRATIVE LAW TEXT* § 7.03 (3d ed. 1972).

⁴⁸ See, e.g., *Dean v. District of Columbia*, 653 A.2d 307, 323 (D.C. 1995) (“[T]he judicial process of finding legislative facts . . . is a difficult and sometimes controversial subject . . .”)

practice, social science evidence of legislative fact is introduced through testimony or briefs.⁴⁹ Courts enjoy wide discretion in obtaining and evaluating legislative facts. First, judges enjoy discretion in the kinds of empirical materials they can consider. The Federal Rules of Evidence explain that the judge is “unrestricted in his investigation and conclusion” of relevant legislative facts, and that he may “reject the propositions of either party, or of both parties[,] consult the sources of pertinent data to which they refer, [and] make an independent search of persuasive data[,] or rest content with what he has or what the parties present.”⁵⁰ The Federal Rules also permit appellate judges to abstain from researching legislative facts by remanding to the trial court for additional factfinding.⁵¹ Second, courts have wide discretion when determining legislative facts based on the materials available to them. The standard for determining a legislative fact appears to be preponderance of the evidence.⁵² And when creating a common law rule, a court may rely upon the empirical assumptions it finds most “plausible.”⁵³

B. Social Authority

Courts⁵⁴ and legal scholars⁵⁵ have questioned the value of the traditional distinction between adjudicative and legislative facts. Monahan and Walker

(citations omitted)); see also John Monahan & Laurens Walker, *Social Authority: Obtaining, Evaluating, and Establishing Social Science in Law*, 134 U. PA. L. REV. 477, 485-86 (1986) (noting that “[n]o positive guidance is provided” to parties on how they should introduce evidence of legislative fact to a court).

⁴⁹ Monahan & Walker, *supra* note 48, at 485-86. For an extended discussion on the lack of procedural guidance for legislative factfinding, see Brianne J. Gorod, *The Adversarial Myth: Appellate Court Extra-Record Factfinding*, 61 DUKE L.J. 1, 43-50 (2011).

⁵⁰ FED. R. EVID. 201 advisory committee’s note (quoting Edmund M. Morgan, *Judicial Notice*, 57 HARV. L. REV. 269, 270-71 (1944)).

⁵¹ *Id.* (citing *Borden’s Farm Prods. Co. v. Baldwin*, 293 U.S. 194 (1934)); see also Arthur Selwyn Miller & Jerome A. Barron, *The Supreme Court, the Adversary System, and the Flow of Information to the Justices: A Preliminary Inquiry*, 61 VA. L. REV. 1187, 1233-34 (1975) (recommending that the Supreme Court remand cases for factfinding on a “particular issue of legislative fact”).

⁵² See, e.g., *Dean*, 653 A.2d at 329 (“[L]egislative facts must at least appear to be more likely than not true if the opinion is going to have the requisite intellectual legitimacy upon which the authority of judge-made rules is ultimately founded.” (emphasis omitted)) (quoting 2 MCCORMICK ON EVIDENCE § 331 (John William Strong ed., 4th ed. 1992)).

⁵³ Monahan & Walker, *supra* note 16, at 580. Different rules may apply to legislative factfinding in other contexts. When courts review the constitutionality of legislation, for example, they often appropriately defer to the empirical assumptions invoked by the legislature in passing the law. *Id.* at 583.

⁵⁴ See, e.g., *Bowling v. Dep’t of Ins.*, 394 So. 2d 165, 174 n.17 (Fla. Dist. Ct. App. 1981) (stating that all facts, whether categorized as legislative or adjudicative, must be substantiated in the same manner so long as the facts are “reasonably susceptible to some kind of proof”), *abrogated by Ferris v. Turlington*, 510 So. 2d 292 (Fla. 1987).

have proposed “social authority” as an alternative understanding of social science in the development of legal precedent.⁵⁶ They observe that unlike “facts,” which “are specific to particular instances,” both social science and legal precedent are general in nature.⁵⁷ The findings of social science research derive from particular empirical observations, but those findings are intended to apply generally to contexts outside of the study.⁵⁸ Similarly, although courts develop legal precedent in response to the specific circumstances in the cases before them, precedent will affect future cases as well.⁵⁹ Noting these similarities between legislative fact and legal precedent, Monahan and Walker recommend that courts treat social science research as a kind of authority, as “they would legal precedent under the common law.”⁶⁰ An appellate court’s evaluation of a specific study or body of social science research should control a lower court’s use of that research, just as an appellate court’s evaluation of case precedent controls a lower court’s use of that precedent.⁶¹

Monahan and Walker’s conception of social authority provides some general guidance to courts in evaluating social science research in the process of formulating precedent. They recommend that courts rely upon social science research that has “survived the critical review of the scientific community,” and that is based upon valid methodology, generalizable to the case at hand, and confirmed by a larger body of research.⁶²

C. *Social Frameworks*

Monahan and Walker have also proposed a second modification to Davis’s traditional distinction between legislative and adjudicative fact. They argue that the distinction fails to acknowledge a third frequent use of social

⁵⁵ See, e.g., Brice McAdoo Clagett, *Informal Action—Adjudication—Rule Making: Some Recent Developments in Federal Administrative Law*, 1971 DUKE L.J. 51, 80 (asserting that the classifications of legislative versus adjudicative facts “alone shed[] very little—if any—light on what procedures are most appropriate for resolving the issue”).

⁵⁶ Monahan & Walker, *supra* note 48, at 488.

⁵⁷ *Id.* at 490.

⁵⁸ *Id.*

⁵⁹ See *id.* at 490-91 (noting that “this attribute of generality . . . is described as the ‘precedential effect’ or authoritative nature of a court decision”).

⁶⁰ *Id.* at 488.

⁶¹ See *id.* at 515 (including the caveat that new research and analysis “can change the empirical conclusions upon which a rule of law rests”).

⁶² *Id.* at 499.

science evidence in courts: social frameworks.⁶³ Unlike adjudicative facts—which provide specific information about the parties before the court—a social framework provides “background context” that helps a factfinder interpret the validity and relevance of adjudicative facts presented before the court.⁶⁴

In *State v. Chapple*, for example, a defendant charged with murder based on the testimony of two eyewitnesses⁶⁵ attempted to introduce expert testimony that certain characteristics of the identification process decreased the reliability of the procedure.⁶⁶ The testimony articulated the results of recent social science research on reliability issues in eyewitness identification.⁶⁷ Because the trial court erroneously excluded the majority of the testimony—“there were a number of substantive issues of ultimate fact on which the expert’s testimony would have been of significant assistance”⁶⁸—the Arizona Supreme Court ordered a retrial.⁶⁹

The expert testimony in *Chapple* does not fit cleanly into either the adjudicative fact or legislative fact category. On the one hand, it resembles testimony on adjudicative facts because it helped the factfinder decide whether the defendant committed the murder. On the other hand, the testimony differs from adjudicative fact because the underlying research was purely general and applied to all criminal cases involving eyewitness identification. This generality manifests a marked similarity with legislative fact, but the testimony was introduced to adjudicate the facts of the particular case, not to develop law. Thus, the social science evidence on eyewitness reliability in *Chapple* fits into neither of the two traditional categories. The concept of social frameworks fills the gap: it explains how general social science evidence can clarify the adjudicative facts for the factfinder, even where the parties “accept the state of the law.”⁷⁰

⁶³ See Laurens Walker & John Monahan, *Social Frameworks: A New Use of Social Science in Law*, 73 VA. L. REV. 559, 568-70 (1987) (discussing the shortcomings of the legislative–adjudicative fact dichotomy and proposing “social frameworks” as a third category).

⁶⁴ See *id.* at 559 (defining a social framework as one “used to construct a frame of reference or background context for deciding factual issues crucial to the resolution of a specific case”).

⁶⁵ 660 P.2d 1208, 1212 (Ariz. 1983) (noting that the two eyewitnesses had never met the defendant prior to the incident and picked him out of a lineup over a year later).

⁶⁶ See *id.* at 1213-18 (recounting defense’s arguments regarding time interval, perception, and unconscious transfer, among others).

⁶⁷ *Id.* at 1218; see generally Gary L. Wells & Donna M. Murray, *What Can Psychology Say About the Neil v. Biggers Criteria for Judging Eyewitness Accuracy?*, 68 J. APPLIED PSYCHOL. 347 (1983) (discussing the results of social science research on the reliability of eyewitness identification at the time that *Chapple* was decided).

⁶⁸ *Chapple*, 660 P.2d at 1224.

⁶⁹ *Id.* at 1226.

⁷⁰ See Monahan & Walker, *supra* note 16, at 570-71.

Facts, then, fall into one of three categories.⁷¹ First, adjudicative facts are facts introduced to prove a factual issue that is specific only to the case at hand. Second, social frameworks are general facts applicable to a wide range of cases that assist factfinders in interpreting case-specific facts.⁷² Third, legislative facts (or social authority) are general facts introduced to formulate and justify legal precedent. The category into which particular evidence fits depends on (1) the purpose for which it is introduced and (2) its level of generality.

II. LIMITATIONS ON INDIVIDUAL SOCIAL SCIENCE STUDIES, LIMITATIONS ON HUMAN INTUITION

Scholars and litigants have frequently argued that social science should not form the basis for judicial decisions in particular cases. I begin this Part by considering four common kinds of objections to social science on the basis of methodological flaws. I then consider a different kind of objection, that the findings of social science studies are inaccurate due to the biases of researchers. I observe that each of these problems appears to resurface even if the court declines to employ social science evidence to resolve a question of common law precedent. Under those circumstances, the judge must rely instead on his or her own empirical intuitions formed through a process subject to the same set of limitations.

A. Methodological Limitations

1. Imprecise Data

Scholars and litigants frequently argue that social science studies rely upon imprecise data that are subject to many sources of error. These errors include, among others, dishonest survey responses,⁷³ memory failure,⁷⁴

⁷¹ *Id.*

⁷² This assertion is, in some sense, a simplification of Monahan and Walker's view of social frameworks. Though they acknowledge that "[s]ocial science used as a social framework is now almost always introduced in court . . . as an 'adjudicative fact,'" Walker & Monahan, *supra* note 63, at 583, they argue that courts should consider treating social frameworks as having properties of social authority in some cases, *see id.* at 587-92.

⁷³ Researchers have observed, for example, that respondents often underreport stigmatized information about their personal background, such as criminal history. *See* David S. Kirk, *Examining the Divergence Across Self-Report and Official Data Sources on Inferences About the Adolescent Life-Course of Crime*, 22 J. QUANTITATIVE CRIMINOLOGY 107, 110 (2006) (discussing prior studies finding that a substantial fraction of subjects did not report that they had a police record).

⁷⁴ *See, e.g.*, Daniel L. Schacter, *The Seven Sins of Memory: Insights from Psychology and Cognitive Neuroscience*, 182 AM. PSYCHOL. 182, 184 (1999) (discussing psychological research on the process

temporal variability,⁷⁵ indirect measurements of unobservable objects of study,⁷⁶ selective reporting,⁷⁷ coding error,⁷⁸ interrater reliability problems,⁷⁹ and unrealistic measurement conditions.⁸⁰ Data error can certainly limit the validity of an empirical study, but not all forms of error will bias the results. In a study of the causal effect of one variable on another, for example, random measurement errors on the latter (dependent) variable generally do not bias causal estimates.⁸¹

of forgetting); *id.* at 191-92 (discussing two cognitive processes, suggestibility and bias, which distort human memory).

⁷⁵ See, e.g., Martha L. Fineman & Anne Opie, *The Uses of Social Science Data in Legal Policy-making: Custody Determinations at Divorce*, 1987 WIS. L. REV. 107, 131 (noting the superiority of repeated-interview over single-interview research designs).

⁷⁶ *Thomas v. Allen*, 614 F. Supp. 2d 1257, 1268-69 (N.D. Ala. 2009) (discussing error inherent in measurements of intelligence, which is *indirectly* measured through respondents' answers to verbal and mathematical questions).

⁷⁷ See, e.g., *Craig v. Boren*, 429 U.S. 190, 202 n.14 (1976) ("The very social stereotypes that find reflection in age-differential laws . . . are likely substantially to distort the accuracy of [arrest statistics on drinking and driving]. Hence 'reckless' young men who drink and drive are transformed into arrest statistics, whereas their female counterparts are chivalrously escorted home." (citation omitted)).

⁷⁸ See Brief for Respondent at 16-18, *McCleskey v. Kemp*, 481 U.S. 279 (1987) (No. 84-6811), 1986 WL 727361 (arguing that the questionnaires used to collect data for a social science study on capital punishment were coded incorrectly into the database).

⁷⁹ See *id.* at 18 (arguing that "differences in judgment among the coders" led to inconsistent survey data). When two different people code the same raw data, it is possible for them to code the data differently. Measures of interrater reliability indicate how similarly they code the same data. See Howard E. A. Tinsley & David J. Weiss, *Interrater Reliability and Agreement of Subjective Judgments*, 22 J. COUNSELING PSYCHOL. 358, 359 (1975) ("Interrater reliability . . . represents the degree to which the ratings of different judges are proportional when expressed as deviations from their means.").

⁸⁰ Laboratory studies on jury behavior are frequently criticized for lacking realism. See, e.g., Brief of Petitioner at 7-8, *Lockhart v. McCree*, 476 U.S. 162 (1986) (No. 84-1865), 1985 WL 669160 (arguing that social science studies of jury behavior in laboratory settings are unreliable because "evidence is deficient to show that the attitudes of laboratory subjects can predict the behavior of real juries"); Wayne Weiten & Shari Seidman Diamond, *A Critical Review of the Jury Simulation Paradigm: The Case of Defendant Characteristics*, 3 LAW & HUM. BEHAV. 71, 83 (1979) ("[E]xtreme caution should be exercised in extrapolating from present jury simulation research to the courtroom."). Studies on the reliability of eyewitness identification have been criticized on similar grounds. See, e.g., Roy S. Malpass & Patricia G. Devine, *Realism and Eyewitness Identification Research*, 4 LAW & HUM. BEHAV. 347, 348 (1981) (noting that the "the empirical base" of the eyewitness identification literature as of 1981 derived from studies that "only remotely reflect the conditions experienced by witnesses to actual criminal events"); Gary L. Wells, *What Do We Know About Eyewitness Identification?*, 48 AM. PSYCHOL. 553, 555 (1993) ("Critics will always contend that real eyewitnesses are better or worse or somehow different than the people used in eyewitness experiments. Critics also might charge that eyewitnesses in experiments are not as cautious about their identification decisions because there is no actual consequence to the falsely identified person.").

⁸¹ Random measurement error in the dependent variable "leave[s] most of the basic regression results intact," but inflates the standard errors of the coefficients. RICHARD A. BERK,

Perhaps more to the point, judges' empirical intuition unguided by systematic data suffers from similar, and in some cases, more severe error. Without systematic data, judges must rely upon their own personal experiences or the personal experiences related to them by others. Error may enter this form of nonsystematic data in two distinct stages. First, personal or anecdotal data must in the first instance be "perceived," or "collected," a process subject to many of the same vagaries as systematic data collection efforts. A brief reflection on the admittedly incomplete enumeration of error in social science demonstrates this. When gathering personal or anecdotal data on a legally relevant characteristic of human behavior, for example, people may lie or dissemble, and their behavior may vary over time depending on when they are observed. Moreover, directly unobservable social phenomena that are difficult to measure in social science research—e.g., intelligence,⁸² social maturity,⁸³ susceptibility to peer pressure,⁸⁴ or the true rate of criminal offending⁸⁵—are likely no easier to perceive accurately through personal or anecdotal experience.

Second, unlike systematically collected data, which can be preserved electronically with great fidelity, extensive psychological research has shown that the accuracy of human memory erodes over time. Individuals can forget certain details of a past experience or even the experience in its entirety.⁸⁶ Accurate memories can also be distorted through a number of different processes. First, the presentation of misleading or false information at a later time can distort otherwise accurate memory.⁸⁷ Second, an individual's

REGRESSION ANALYSIS: A CONSTRUCTIVE CRITIQUE 73 (2004). Random measurement error on the independent variable, however, can result in bias. *Id.* at 74. Nonrandom or "systematic" error on either the independent or dependent variable can also bias the results. *Id.* at 73.

⁸² See *supra* note 76 and accompanying text.

⁸³ See Lawrence Steinberg et al., *Are Adolescents Less Mature than Adults?: Minors' Access to Abortion, the Juvenile Death Penalty, and the APA "Flip-Flop,"* 64 AM. PSYCHOL. 583, 583 (2009) (discussing the significance of the comparative maturity of adolescents and adults in the Supreme Court jurisprudence on the administration of the death penalty for juveniles); *id.* at 588 (describing a method of indirectly measuring maturity by asking subjects questions about their perception of the risk associated with certain activities).

⁸⁴ See *Lee v. Weisman*, 505 U.S. 577, 580, 593-94 (1992) (considering psychological research on adolescents' susceptibility to peer pressure in deciding "whether including clerical members who offer prayers as part of the official school graduation ceremony is consistent with the Religion Clauses of the First Amendment").

⁸⁵ See *Craig v. Boren*, 429 U.S. 190, 202 n.14 (1976) (discussing the difficulty of accurately measuring the relative rate of drunk driving among men and women due to selective arresting).

⁸⁶ See Schacter, *supra* note 74, at 184 (discussing the phenomena of the "transience" of memory and the process of gradual forgetting).

⁸⁷ See *id.* at 191-92 (describing a series of psychological studies in which research subjects "remembered" details of personal experiences that never happened after they were informed that members of their family remembered the event).

confidence that an event took place in the past can be influenced simply by whether the person has imagined the event in his or her mind.⁸⁸ Third, an individual's current knowledge, beliefs, and expectations can also influence memory.⁸⁹ Indeed, psychologists have observed that memory is subject to a consistency bias through which individuals' current attitudes color their recollection of prior perceptions and incidents.⁹⁰ Finally, individuals frequently forget or misattribute the sources of particular facts and experiences.⁹¹ Thus, where judges lack relevant personal experience, they may rely on unreliable sources of data—or perhaps even fictional data from popular culture—in drawing conclusions about complex questions of empirical fact.⁹²

Concerns about error in social science data may not, on their own, provide sufficient reason to ignore social science evidence in deciding an issue of common law precedent. At least where judges cannot circumvent the need to take sides on the empirical issue,⁹³ these same concerns about error seem to reappear even if the court ignores the relevant social science research.

2. Nonrandom Sampling Designs

Scholars and litigants have also argued that social science research often employs weak sampling methods.⁹⁴ A sampling design defines the rules by which individuals are selected for inclusion in a study. Ideally, subjects are

⁸⁸ See Maryanne Garry et al., *Imagination Inflation: Imagining a Childhood Event Inflates Confidence That It Occurred*, 3 PSYCHONOMIC BULL. & REV. 208, 213 (1996) (“[I]magining a self-reported counterfactual event increased confidence that the event did happen.”).

⁸⁹ See Schacter, *supra* note 74, at 193-94 (describing the results of a series of psychological studies establishing the consistency bias).

⁹⁰ *Id.*

⁹¹ See *id.* at 188 (discussing psychological research which shows that “people may remember correctly an item or fact from a past experience but misattribute the fact to an incorrect source”).

⁹² For an extended and generally accessible treatment of the limitations on intuition and reasoning in decisionmaking, see generally DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2011).

⁹³ See *supra* note 19 and accompanying text.

⁹⁴ See, e.g., Brief of Leon R. Kass, Harvey C. Mansfield & The Institute for Marriage and Public Policy as Amici Curiae in Support of Petitioners at 19, *Hollingsworth v. Perry*, No. 12-144 (U.S. Jan. 29, 2013), 2013 WL 416200 (attacking the “nonrepresentative samples” used in studies cited by an opposing brief to show that “a significant fraction of gay men and lesbians are or have been in a ‘committed relationship’”); Faigman, *supra* note 13, at 1060 (“Research programs . . . using sample[s] . . . bearing little or no resemblance to the population of interest to the law possess little legal relevance.”); see also *Wards Cove Packing Co. v. Atonio*, 490 U.S. 642, 650-52 (1989) (rejecting the relevance of a data analysis in an employment discrimination case because it was based upon a sample of individuals that did not represent the pool of qualified job applicants).

sampled randomly so they represent the wider population of interest.⁹⁵ But, in many cases, social scientists must rely upon less rigorous sampling designs.

In convenience sampling, for example, subjects are selected because of their proximity and availability to the researcher.⁹⁶ Convenience sampling thus provides no rigorous assurance that the sample will represent the population of interest.⁹⁷

Convenience and other forms of nonrandom sampling pose important methodological limitations, but two observations mitigate the risks. First, non-random sampling methods do not always bias a study's result.⁹⁸ Second, even where researchers rely on nonrandom sampling, they should describe the processes by which subjects were obtained and entered into the sample.⁹⁹ The same kind of transparency is not available where courts draw empirical judgments based only on intuition and personal experience.

Perhaps more importantly, the problems associated with nonrandom sampling resurface even if the court chooses to ignore the relevant social science study in resolving a question of common law precedent that involves controversial empirical assumptions. Drawing empirical conclusions without the assistance of social science evidence itself leads to sampling problems. The totality of a judge's personal experiences and the personal experiences of those nearby may form a small and highly selective sample of data that represents only a small cross section of the upper tiers of society. Moreover, judges' perceptions of the frequency or risk of specific events may also be distorted by the relative frequency with which particular events are discussed among members of the public, or reported in the media.¹⁰⁰

⁹⁵ See Lee Epstein & Gary King, *The Rules of Inference*, 69 U. CHI. L. REV. 1, 110 (2002) (“[R]andom selection is the only selection mechanism . . . that automatically guarantees the absence of selection bias.” (emphasis omitted)).

⁹⁶ *Id.* at 105.

⁹⁷ *Id.* at 110.

⁹⁸ See *id.* at 106 (noting that the primary concern with nonrandom sampling methods is when observations are selected “such that those items that somehow make their way into the [sample] are correlated with the dependent variable (*Y*), even after taking into account the explanatory variable (*X*)”).

⁹⁹ *Id.* at 103 (asserting that researchers should collect “information about the process by which the data come to be observed”).

¹⁰⁰ See KAHNEMAN, *supra* note 92, at 138 (noting that our perception of the frequency of certain events is “warped by media coverage” and explaining that “[u]nusual events . . . attract disproportionate attention and are consequently perceived as less unusual than they really are”).

3. Unreported Data Mining

Critics have noted that social science findings are sometimes the result of disingenuous forms of data mining.¹⁰¹ Scientists typically collect and analyze data from a subset of the overall population. As a result, they must conduct statistical hypothesis tests to determine whether patterns observed in the sample can be inferred to apply to the total population. The power of statistical hypothesis tests to protect against detecting spurious statistical relationships, however, decreases as the number of tests increases.¹⁰² Thus, a scientist who conducts a large number of statistical tests without reporting that information can produce misleading findings. Selective data reporting is even more problematic where a researcher conducts a large number of statistical tests and presents only those results that are consistent with the researcher's preferred theory.¹⁰³

Unreported or disingenuous forms of data mining certainly undermine the evidentiary value of individual empirical studies. Social scientists have a professional and personal incentive to falsify existing theory in their fields. The scientific value of replication provides at least some protection against spurious results arrived at through undisclosed data mining. The results of prior studies are often subjected to further testing by other researchers who—assuming they do not engage in the same practices—are unlikely to replicate the results.¹⁰⁴

¹⁰¹ See, e.g., Greeley, *supra* note 14, at 50 (“[O]ne can . . . play a thousand different mathematical games with the data and finally tease out something which may be in accordance with one’s own ideology.”).

¹⁰² See Juliet Popper Shaffer, *Multiple Hypothesis Testing*, 46 ANN. REV. PSYCHOL. 561, 562 (1995) (“[W]hen many hypotheses are tested, and each test has a specified Type I error probability, the probability that at least some Type I errors are committed increases, often sharply, with the number of hypotheses.”).

¹⁰³ See, e.g., *Hobson v. Hansen*, 327 F. Supp. 844, 859 (D.D.C. 1971) (rejecting the social science evidence presented before the court because the studies were “tainted by a vice well known in the statistical trade—data shopping and scanning to reach a preconceived result”). Concerningly, this kind of improper scientific practice need not be intentional. Greiner explains,

Model-checking is typically a multi-stage process: the analyst implements a first model, assesses fit, is less than perfectly satisfied, implements a second model, assesses fit, compares the fit of the first model to that of the second, implements a third, etc. A model’s fit is never perfect. At each stage of this process of exploration and assessment, the substantive result, the litigation answer, stares the analyst in the face. Only the superhuman can completely disregard the temptation to lean towards a result favorable to a chosen side, consciously or no.

D. James Greiner, *Causal Inference in Civil Rights Litigation*, 122 HARV. L. REV. 533, 544 (2008) (footnotes omitted).

¹⁰⁴ Thomas C. Leonard elaborates on the self-correction of the social sciences:

4. Correlation and Causation

Social science explores questions of causation, but often produces only evidence of correlation.¹⁰⁵ Litigants frequently argue,¹⁰⁶ for example, that the empirical evidence presented by an opposing party suffers from what social scientists call omitted variable bias.¹⁰⁷ Omitted variable bias arises when a study fails to control for a relevant variable that is correlated with

Because it helps promote replication, rivalry in science works to help eliminate error in a kind of self-correcting fashion. Errors get exposed *not* because scientists disinterestedly refute their own pet theories, but because their interested rivals have partisan incentives to do so. Moreover, interested rivals are generally the most qualified reviewers. Those with the greatest incentive to criticize are also those with the greatest expertise.

Thomas C. Leonard, *Reflection on Rules in Science: An Invisible-Hand Perspective*, 9 J. ECON. METHODOLOGY 141, 159 (2002). Admittedly, the process of publication can move slowly; therefore, it may take time for such errors to be corrected.

¹⁰⁵ See, e.g., Ronald Dworkin, *Social Sciences and Constitutional Rights—The Consequences of Uncertainty*, 6 J.L. & EDUC. 3, 5 (1977) (“While in physics it is now thought to be an unsound judgment that rests merely on correlation between observable events unsupported by some notion of the mechanics that translate the cause to the effect, social science usually is only able to provide correlations without the mechanics.”); cf. Fineman & Opie, *supra* note 75, at 131 (discussing, with a focus on child custody literature, the failure of studies to control for the “multitude of variables” that might be the true cause of, or might contribute to, the problem at hand).

¹⁰⁶ See, e.g., Brief for the United States at 39, *Peugh v. United States*, No. 12-62 (U.S. Jan. 25, 2013), 2013 WL 315237 (arguing that the petitioner “mistakes correlation for causation” by concluding that the federal sentencing guidelines have “a legally binding effect” on the basis of a “correlation between the sentences judges impose and the ranges that the Guidelines recommend” (quoting *Woodford v. Ngo*, 548 U.S. 81, 94 n.4 (2006) (internal quotation marks omitted))); Brief of Empirical Scholars as Amici Curiae in Support of Respondents at 21-22, *Fisher v. Univ. of Tex. at Austin*, No. 11-345 (U.S. Aug. 13, 2012), 2012 WL 3418837 (arguing that the empirical research cited by the opposing party to support the mismatch theory of affirmative action “violates the [research] principle of creating groups that are comparable in all pre-existing respects except for law-school tier”); Brief for Respondent, *supra* note 78, at 16 (criticizing the lack of methodological rigor of a social science study—introduced by the opposing party to prove the presence of racial discrimination in a death penalty case—by arguing that the statistical analysis “fails to include appropriate variables [and] fails to utilize interaction variables”); Defendant-Appellant Standard Federal Bank’s Opposition to Plaintiffs-Appellees’ Second Motion to Supplement Record at 1, 19 n.27, *Glover v. Standard Fed. Bank*, 283 F.3d 953 (8th Cir. 2002) (No. 00-3611MNMI), 2001 WL 35902533 (opposing a motion to supplement the appellate record with an expert social science report and arguing that the report’s statistical analyses omitted important variables); see also, e.g., *Eastland v. Tenn. Valley Auth.*, 704 F.2d 613, 622 (11th Cir. 1983) (noting that a party argued that the court should accord little weight to a regression analysis in resolving an employment discrimination case because it “failed to control for job category”).

¹⁰⁷ If any omitted variables are “correlated with any of the regressors,” we “cannot expect [the regression analysis] to consistently estimate any” of the parameters in the model. JEFFREY M. WOOLDRIDGE, *ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA* 66 (2d ed. 2010). In multivariate linear regression, for example, omitted variable bias arises when a study fails to control for a relevant variable that is correlated with one or more of the variables included in the model. *Id.* at 54-55.

one or more of the variables included in the model.¹⁰⁸ The omission results in causal estimates that are, on average, incorrect. Unfortunately, limits on data availability as well as limits on our understanding of underlying causal phenomena mean that all relevant variables cannot always be included in an empirical study. In effect, correlations observed between variables may not represent causation.

Omitted variable bias is an important concern, but the use of methodological tools that address this challenge has increased in recent decades. It is well known, for example, that experiments can eliminate the risk of omitted variable bias through randomization.¹⁰⁹ Additionally, researchers may sometimes use other methods like instrumental variable analysis¹¹⁰ and regression discontinuity¹¹¹ to decrease bias in estimates of causal relations. A number of other common analytic methods to reduce the risks of omitted variable bias are also available.¹¹² Finally, in cases where the possibility of omitted variable bias cannot be ruled out, some statistical procedures enable direct assessment of the likelihood that a causal estimate is merely the result of bias.¹¹³

Even if specific social science studies suffer from omitted variable bias, it is unclear whether judges facing complex empirical questions fare any better when they decline to rely on social science evidence in resolving questions of common law precedent. Indeed, generalizations inferred from anecdotal data at judges' disposal are similarly limited by the possibility of mistaking correlation for causation. Moreover, research comparing the accuracy of clinical prediction¹¹⁴ versus statistical prediction bears this out. Numerous studies have demonstrated that both laypersons and experts are substantially

¹⁰⁸ *Id.* at 54-55.

¹⁰⁹ See generally Joshua D. Angrist & Alan B. Krueger, *Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments*, J. ECON. PERSP., Fall 2001, at 72.

¹¹⁰ See *id.* at 69, 72-77.

¹¹¹ Guido W. Imbens & Thomas Lemieux, *Regression Discontinuity Designs: A Guide to Practice*, 142 J. ECONOMETRICS 615, 616 (2008).

¹¹² For instance, estimating random or fixed effects on panel data solves the problem of omitted variable bias for variables that remain fixed over time, such as intelligence or genetic makeup. See WOOLDRIDGE, *supra* note 107, at 281-87.

¹¹³ For example, sensitivity analyses can assess the likelihood that bias is responsible for the results of an analysis produced through propensity score matching. See Paul R. Rosenbaum, *Sensitivity Analysis for Certain Permutation Inferences in Matched Observational Studies*, 74 BIOMETRIKA 13, 13, 15-17 (1987) (describing a "sensitivity analysis" which measures "the extent to which inferences about a treatment effect vary over a range of plausible assumptions about unmeasured pretreatment differences").

¹¹⁴ A judge's prediction is akin to what has been referred to as "clinical judgment." See William M. Grove et al., *Clinical Versus Mechanical Prediction: A Meta-Analysis*, 12 PSYCHOL. ASSESSMENT 19, 19 (2000) ("Clinical judgment refers to the typical procedure long used by applied psychologists and physicians, in which the judge puts data together using informal, subjective methods." (emphasis omitted)).

worse than statistical models at predicting a wide range of human behaviors, including violence, job performance, marital satisfaction, and psychological outcomes.¹¹⁵

Thus, concern about the rigor of causal inference in a relevant social science study may not, on its own, provide sufficient reason to ignore the study in deciding an issue of precedent. At least where judges cannot circumvent the need to take sides on the empirical issue, the same concerns about causal inference seem to reappear even if the court ignores the study.

B. *The Biases of Social Scientists Distort the Results of Their Research*

Researchers in both the physical and social sciences are subject to personal and professional pressures that may distort the results of their studies.¹¹⁶ Research findings may, for example, impact a range of interests that include job security, promotion, salary, and social prestige.¹¹⁷ Scientists may also have an interest in protecting a viewpoint they have endorsed in prior work. But researcher bias may be particularly strong in the social sciences, where empirical findings often have implications for controversial questions of public policy.¹¹⁸

Scholars and litigants have argued against the use of social science research in judicial adjudication because cultural or ideological bias may distort empirical findings.¹¹⁹ They have argued, for example, that bias enters the

¹¹⁵ See, e.g., *id.* at 22 tbl.1; Robyn M. Dawes et al., *Clinical Versus Actuarial Judgment*, 243 SCIENCE 1668, 1669 (1989) (reporting that virtually all of the 100 studies reviewed found that statistical models provided better predictions than trained clinicians).

¹¹⁶ See Raymond E. Spier, *On Dealing with Bias*, 8 SCI. & ENGINEERING ETHICS 483, 483 (2002) (providing an extensive list of incentives that may bias the results of researchers' findings).

¹¹⁷ *Id.*

¹¹⁸ See, e.g., Ann Woolhandler, *Rethinking the Judicial Reception of Legislative Facts*, 41 VAND. L. REV. 111, 119 (1988) ("One's beliefs about causation are closely tied to one's beliefs about desirable effects. . . . [I]f one sees a racially integrated society as a desirable end, one may also view the current segregated society as resulting from forces other than individual merit. A view that racial integration is undesirable frequently accompanies a view that individual merit is a strong causative factor in the current segregation of society.").

¹¹⁹ See, e.g., Brief of Leon R. Kass, et al., *supra* note 94, at 2 (disputing the existence of a "scientific basis for constitutionalizing same-sex marriage" by arguing that existing social science studies on the topic are "shaped and driven by politics and ideology"); Brief of Amicus Curiae Comic Book Legal Defense Fund in Support of Respondents at 17, *Brown v. Entm't Merchs. Ass'n*, 131 S. Ct. 2729 (2011) (No. 08-1448), 2010 WL 3697188 (asserting that "social science can do great damage when it is 'weak in methodology, but strong in ideology'" (quoting Christopher J. Ferguson & Cheryl K. Olson, *The Supreme Court and Video Game Violence: Will Regulation Be Worth the Costs to the First Amendment?*, CRIMINOLOGIST (Am. Soc'y of Criminology, Columbus, Ohio), July/Aug. 2010, at 18, 20)); Faigman, *supra* note 13, at 1026-27 (noting the "often repeated criticism" that "social scientists' values affect the kinds of research done and, at least indirectly, the findings

research process in the selection of issues and research questions, and in the collection of data.¹²⁰ “[I]nherent bias” in the underlying methodology of these studies may undermine the description of any findings as “neutral ‘facts.’”¹²¹ Social scientists’ preconceived assumptions about the world may also influence how they *interpret* their data.¹²²

Of course, there is little reason to suspect that social scientists are the only individuals whose empirical judgments are subject to bias. Two areas of research provide some insight on bias among judges.

First, legal scholars have closely examined the relationship between ideology and judicial decisionmaking.¹²³ Early studies reported a “profound partisan effect”¹²⁴ of political ideology¹²⁵ on judicial decisions in environmental and administrative law cases. For instance, an analysis of industry procedural challenges to decisions by the Environmental Protection Agency found that the “reversal rate for panels with two Democrats and one Republican ranges between 2% and 13%, whereas for panels with two Republicans and one Democrat the reversal rate ranges from 54% to

of that research”); Fineman & Opie, *supra* note 75, at 110, 126-27 (“[L]egal uses of social science literature, designated as objective, neutral, and scientific uses of objective, neutral, and scientific facts, may ‘in fact’ be inherently political and/or ideological statements, which are shielded and obscured by the scientific mantle in which they are wrapped.”); Rustad & Koenig, *supra* note 14, at 158 (“All social science studies may be biased by the investigators’ methodology, theory, prejudices, or funding.”).

¹²⁰ See Fineman & Opie, *supra* note 75, at 126 (“Bias enters the selection of the issue to be examined, the questions asked in the examination, and the compilation of the data.”); *id.* at 130 (“The data can never be totally separated from the political, personal, and professional opinions of the person manipulating them.”).

¹²¹ See *id.* at 126.

¹²² See Woolhandler, *supra* note 118, at 119 (“The . . . social scientist asks a question and interprets data based on a pre-existing hypothesis about causation; this is . . . especially true for the soft sciences, which typically serve as the source for legislative facts.”); *id.* at 120 (“Pre-existing views about the causes of desirable and undesirable effects govern social scientists’ development of legislative facts . . .”).

¹²³ See generally CASS R. SUNSTEIN ET AL., ARE JUDGES POLITICAL? AN EMPIRICAL ANALYSIS OF THE FEDERAL JUDICIARY (2006); Frank B. Cross & Emerson H. Tiller, *Judicial Partisanship and Obedience to Legal Doctrine: Whistleblowing on the Federal Courts of Appeals*, 107 YALE L.J. 2155 (1998); William M. Landes & Richard A. Posner, *Rational Judicial Behavior: A Statistical Study*, 1 J. LEGAL ANALYSIS 775 (2009); Michael A. Perino, *Law, Ideology, and Strategy in Judicial Decision Making: Evidence from Securities Fraud Actions*, 3 J. EMPIRICAL LEGAL STUD. 497 (2006); Richard L. Revesz, *Environmental Regulation, Ideology, and the D.C. Circuit*, 83 VA. L. REV. 1717 (1997); Gregory C. Sisk & Michael Heise, *Judges and Ideology: Public and Academic Debates About Statistical Measures*, 99 NW. U. L. REV. 743 (2005).

¹²⁴ Cross & Tiller, *supra* note 123, at 2169.

¹²⁵ In empirical studies of federal courts, a judge’s political ideology is often assumed to match that of the president who appointed the judge. See Sisk & Heise, *supra* note 123, at 780 (describing this approach as a “standard practice in empirical study of judicial decisionmaking by both legal and political science scholars”).

89%.”¹²⁶ In a study of D.C. Circuit cases reviewing an issue of administrative law under *Chevron*,¹²⁷ Cross and Tiller estimated that “when the agency’s policy outcome is consistent with the policy preferences of the panel’s majority, the court is [31%] more likely to defer than if there is no such convergence.”¹²⁸ Methodological criticisms of this area of the research literature,¹²⁹ as well as other empirical findings, may have tempered the theoretical implications drawn on its basis.¹³⁰

The scholarship described above explores broad questions about the effects of ideology and policy preference on judicial decisions generally. These decisions involve a complex array of legal, normative, and empirical components. Thus, the existing literature on judicial ideology provides only limited insight on the narrower question of whether courts can draw specifically *empirical* judgments without concerns of bias. A second and emerging literature examines the relationship between values and empirical perceptions among the general population and addresses the narrower question of whether individuals can draw specifically empirical judgments without concerns of bias. Scholars, for example, have found robust correlations between individuals’ cultural values and their perceptions of environmental risks.¹³¹ Scholars have also observed substantial correlations between values and perceptions of the effectiveness of public policies such as gun regulation, the death penalty, drug criminalization, business regulation, and abortion.¹³² Perhaps most relevant here, scholars have found that cultural values are strongly correlated not only with empirical perception of risks,

¹²⁶ Revesz, *supra* note 123, at 1763.

¹²⁷ See *Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-44 (1984) (imposing a deferential standard for Article III courts’ review of administrative agency action).

¹²⁸ Cross & Tiller, *supra* note 123, at 2171.

¹²⁹ See Harry T. Edwards, *Collegiality and Decision Making on the D.C. Circuit*, 84 VA. L. REV. 1335, 1343-64 (1998) (responding directly to Revesz’s and Cross and Tiller’s works, challenging the validity of their empirical methods, questioning their interpretation of data, and arguing for an alternative explanation of their results); Epstein & King, *supra* note 95, at 87-89, 95-96 (questioning the validity and efficiency of using the party of the President who appointed them as a proxy for judges’ policy preferences and proposing an alternative method).

¹³⁰ As one commentator notes, the “growing body of research on the lower federal courts . . . reveals that ideology explains a relatively modest part of judicial behavior.” Sisk & Heise, *supra* note 123, at 746.

¹³¹ See, e.g., Karl Dake, *Orienting Dispositions in the Perception of Risk: An Analysis of Contemporary Worldviews and Cultural Biases*, 22 J. CROSS-CULTURAL PSYCHOL. 61, 71 tbl.1 (1991) (correlating ideological constructs such as egalitarianism and individualism with measures of individuals’ perception of risk on a range of social issues).

¹³² See Dan M. Kahan & Donald Braman, *Cultural Cognition and Public Policy*, 24 YALE L. & POL’Y REV. 149, 158-60 (2006) (“Not only did cultural worldviews have the predicted influence on beliefs, they also explained such beliefs more powerfully than any other individual characteristic . . .”).

but also with individuals' perceptions of the existence of a consensus among scientific experts with respect to specific issues.¹³³

Dan Kahan and his colleagues have proposed the concept of cultural cognition to explain the correlations between cultural values and perceptions of empirical fact. Cultural cognition theory posits that group values influence individuals' perceptions of empirical facts.¹³⁴ Its proponents explain that "[t]he law often requires decisionmakers to infer facts they cannot directly observe: states of mind, causal links, and the like. In such circumstances, individuals naturally gravitate toward factual perceptions that reflect their group commitments."¹³⁵ Individuals experience some pressure to "fit their perceptions of how the world *does* work to their shared appraisals of how the world *should* work."¹³⁶ In the context of empirical facts used to form policy, "individuals conform their factual beliefs about the efficacy of policies to the cultural meanings that various policies convey."¹³⁷ Cultural cognition theory therefore provides evidence that the empirical judgments of everyone—laypeople, judges, and social scientists alike—are subject to some level of bias when forming empirical judgments about the world.

Certain constraints imposed by the process of scientific research, however, suggest that social science produces empirical judgments with considerably lower levels of bias. First, social scientists must rely on systematically collected data to test empirical hypotheses. Second, they should abide by the accepted methodological standards of their fields in arriving at their conclusions, which includes reporting all relevant information necessary to assess the quality of the study.¹³⁸ Third, the peer review process in mainstream scientific journals requires that multiple methodological and substantive experts review manuscripts before they are accepted for publication. This process helps ensure that studies conform to methodological standards of their respective fields and identify their limitations in print.¹³⁹ Fourth,

¹³³ See Dan M. Kahan et al., *Cultural Cognition of Scientific Consensus*, 14 J. RISK RES. 147, 167 (2011) ("Subjects holding hierarchical and individualistic outlooks . . . and ones holding egalitarian and communitarian outlooks . . . significantly disagreed about the state of expert opinion on climate change, nuclear waste disposal, and handgun regulation.").

¹³⁴ See Dan M. Kahan, *Culture, Cognition, and Consent: Who Perceives What, and Why*, in *Acquaintance-Rape Cases*, 158 U. PA. L. REV. 729, 732-33 (2010).

¹³⁵ *Id.* at 732.

¹³⁶ *Id.*

¹³⁷ Dan M. Kahan et al., *Cultural Cognition and Public Policy: The Case of Outpatient Commitment Laws*, 34 LAW & HUM. BEHAV. 118, 121 (2010) (citation omitted).

¹³⁸ See Epstein & King, *supra* note 95, at 38 ("Good empirical work adheres to the *replication standard*: another researcher should be able to understand, evaluate, build on, and reproduce the research without any additional information from the author.").

¹³⁹ See Leonard, *supra* note 104, at 157.

the scientific community places a strong emphasis on the replication of analyses for new sources of data and by different scholars.¹⁴⁰ Results that generally cannot be replicated should be regarded with skepticism. And fifth, systematic literature reviews and, more recently, formal meta-analyses enable the scientific community to pool results across a large number of studies and, thus, draw more formal and systematic conclusions about a body of research.¹⁴¹ Together, these features of social science research place some limits on the potential for researchers' personal biases to infect the findings of their work.

Overall, bias appears to enter the judicial process—either through the biases of the researchers, the judge, or both—regardless of whether a judge decides to rely upon social science evidence in resolving a question of common law precedent. However, the use of social science evidence provides three additional benefits over the use of unguided empirical intuition and personal experience. First, where significant scientific consensus exists, a review of the existing social science literature may challenge a judge's potentially false perception of the scope of such consensus.¹⁴² Most judges, of course, cannot keep up-to-date on social science research. Therefore, a review of a specific field prompted by the issues of a particular case will assist the judge in obtaining a more accurate perception of the current state of the literature.

Second, the relevant social science literature may persuade a judge that his own empirical intuition is inaccurate. Interestingly, Kahan and colleagues have extended cultural cognition theory to explain how expert opinion influences individuals' perceptions of empirical facts.¹⁴³ In one study, the authors measured "how cultural values influence" the subjects' perceptions of the risk associated with the HPV vaccine.¹⁴⁴ The authors found that presenting subjects with the opinions of two policy experts—one in favor of vaccination and one against—increased the subjects' perception of the risks relative to the benefits of the vaccine regardless of the subjects' cultural background.¹⁴⁵ But, they also found that the size of this effect varied by the

¹⁴⁰ See Epstein & King, *supra* note 95, at 38.

¹⁴¹ See *infra* notes 184-90.

¹⁴² See Kahan et al., *supra* note 133, at 156-69 (finding that a subject's ideological background influences his perception of consensus among experts).

¹⁴³ See Dan M. Kahan et al., *Who Fears the HPV Vaccine, Who Doesn't, and Why? An Experimental Study of the Mechanisms of Cultural Cognition*, 34 LAW & HUM. BEHAV. 501, 504 (2010) (hypothesizing that "people will selectively credit or discredit information on risk in a manner that fits their cultural predispositions toward them" and that cultural affinity determines "whom people see as knowledgeable, honest, and unbiased").

¹⁴⁴ *Id.* at 503.

¹⁴⁵ See *id.* at 509 ("[B]eing exposed to arguments raises the perception of risk overall.").

subjects' cultural worldviews and their perception of whether the expert "share[d] their basic view of how society should be organized."¹⁴⁶ These findings—though collected through an online survey that provided just a few sentences of expert opinion on the HPV vaccine—suggest that the effect of social science research on courts might vary by judge, the substantive empirical issue, and the background of the experts in the scientific debate.

Third, the explicit use of social science data increases the transparency of judicial decisions. Though some judges may, therefore, shy away from social science evidence, more explicit reasoning provides greater opportunity for a meritorious challenge on appeal or in subsequent cases.¹⁴⁷ Judicial judgments on complex issues of empirical fact that are not based on external data leave little opportunity for review. "The worth . . . of a study can almost always be discerned from the methods section."¹⁴⁸ The same cannot be said of empirical judgments based on personal experience and intuition.

III. A BODY OF SOCIAL SCIENCE STUDIES AND THE DANGER OF OVERTURNING PRECEDENT

In the previous Part, I focused on limitations on the value of *individual* empirical studies for formulating judicial precedent. Here, I consider limitations that arise when we consider a larger body of research that focuses on the same empirical question or a host of related questions. I consider two features of these bodies of research in particular: a small number of studies and inconsistent findings.

A. *Small Literatures*

Scientific theory is most reliable when it has been subjected to a large number of tests in a range of different contexts by a diverse set of researchers. In some cases, however, the relevant social science literature will be small in size. Smaller literatures come with an important limitation: a higher risk that subsequent research will overturn the findings of the existing literature.

¹⁴⁶ *Id.* at 512.

¹⁴⁷ *Cf.* Meares, *supra* note 12, at 869 ("Empiricism will make criminal justice decisions—constitutional criminal procedure decisions in particular—more transparent. Adjudication that expressly and openly discusses the normative judgments at the core of constitutional criminal procedure is transparent. Reference to relevant social science and empirical data creates transparency because these references ground factual assertions. As a result, interpretive choices are more clearly reflected. Increased attention to empirical evidence will not guarantee the *right* answers in criminal procedure cases, but use of empirical evidence will produce a *clearer* picture of the existing constitutional landscape and spotlight the normative judgments at the heart of criminal procedure cases.").

¹⁴⁸ Faigman, *supra* note 13, at 1031.

Critics of social science have raised the “overturnability” objection in two forms.

1. Overturning Precedent Due to Changes in Scientific Understanding

Scholars, and occasionally litigants, have argued that, even though a social fact may remain constant over time, our theoretical understanding of that phenomenon changes as social scientists publish new studies.¹⁴⁹ Thus, justifying legal policy on the basis of social science theory may require frequent revisions of existing law in order to stay current with the social science literature.

This version of the overturnability argument appears misplaced for several reasons. First, the objection assumes that individual studies are definitive and that a given study can, on its own, reverse scientists’ understanding of complex empirical issues. However, the slow evolution of social science knowledge sharply limits the need to revise precedent frequently.

Second, even in the unlikely situation in which a body of social science wobbles back and forth over a short period of time, Monahan and Walker’s conception of social authority suggests that courts can avoid frequent revision by importing a kind of *stare decisis* to the empirical assumptions of judicial precedent.¹⁵⁰ Courts may require that research meet some relevant threshold before a revision to precedent is warranted. For example, in the 1977 case *Manson v. Brathwaite*, the Supreme Court held that evidence of an eyewitness identification is inadmissible if the officer administering the procedure engaged in “unnecessarily suggestive” behavior, and the procedure rendered the identification unreliable.¹⁵¹ The Court did not appear to use social science evidence in arriving at this decision,¹⁵² but it certainly relied upon the empirical assumption that the five factors it laid out were

¹⁴⁹ Edmond Cahn, *Jurisprudence*, 30 N.Y.U. L. REV. 150, 167 (1955) (“[S]ince the behavioral sciences are so very young, imprecise, and changeful, their findings have an uncertain expectancy of life. Today’s sanguine asseveration may be cancelled by tomorrow’s new revelation—or new technical fad.”); see also Brief of Amici Curiae, Alabama et al. at 28, *Lockhart v. McCree*, 476 U.S. 162 (1986) (No. 84-1865), 1985 WL 669159 (arguing that sociological studies are “inadequate bases for constitutional decisionmaking even when they have been strong and consistent,” and citing changes in accepted theory on the deterrent effect of the death penalty as an example).

¹⁵⁰ Monahan & Walker, *supra* note 48, at 488-89 (proposing that “courts treat social science research as they would legal precedent under the common law”).

¹⁵¹ See 432 U.S. 98, 110-14 (1977).

¹⁵² The Court did not cite any social science studies. Furthermore, the psychological literature at the time of the decision had just begun to develop. See Gary L. Wells & Deah S. Quinlivan, *Suggestive Eyewitness Identification Procedures and the Supreme Court’s Reliability Test in Light of Eyewitness Science: 30 Years Later*, 33 LAW & HUM. BEHAV. 1, 1 (2009).

valid indicators of reliability. Drawing from its decision in *Neil v. Biggers*,¹⁵³ the Court established five factors to determine the reliability of the procedure, including “the opportunity of the witness to view the criminal at the time of the crime, the witness’ degree of attention, the accuracy of his prior description of the criminal, the level of certainty demonstrated at the confrontation, and the time between the crime and the confrontation.”¹⁵⁴ Since 1977, psychologists have produced a large body of empirical literature showing that at least three of these five factors are poor indicators of reliability,¹⁵⁵ and that some effective indicators are not acknowledged in *Manson* at all.¹⁵⁶ But the Supreme Court “has yet to . . . overhaul *Manson*’s outdated rule.”¹⁵⁷ Though perhaps an extreme and unfortunate example, ongoing judicial deference to *Manson* shows that changes in scientific theory do not necessarily prompt immediate revisions to judicial precedent.

2. Overturning Precedent Due to Changes in Social Phenomena

Scholars and litigants have also raised a second form of the overturnability objection by asserting that judicial rules, and especially constitutional rights, should not be based upon social science data, not merely because our understanding of the relevant empirical phenomenon changes over time, but because the *phenomenon itself* changes.¹⁵⁸ In *United States v. Peugh*, for

¹⁵³ 409 U.S. 188 (1972).

¹⁵⁴ *Manson*, 432 U.S. at 114 (citing *Neil*, 409 U.S. at 199-200).

¹⁵⁵ See, e.g., *State v. Henderson*, 27 A.3d 872, 918 (N.J. 2011) (“[Three of the *Manson* factors] rely on self-reporting by eyewitnesses; and research has shown that those reports can be skewed by the suggestive procedures themselves and thus may not be reliable. . . . [W]hen reports are tainted by a suggestive process, they become poor measures . . . to bar unreliable evidence.”).

¹⁵⁶ See *id.* at 919 (implying that the *Manson* standard does not “allow[] judges to consider all relevant factors that affect reliability”).

¹⁵⁷ Timothy P. O’Toole & Giovanna Shay, *Manson v. Brathwaite Revisited: Towards a New Rule of Decision for Due Process Challenges to Eyewitness Identification Procedures*, 41 VAL. U. L. REV. 109, 116 (2006). The Supreme Court of New Jersey recently found that the empirical assumptions of *Manson* are invalid and thus revised the standard to better reflect current knowledge on the reliability of eyewitness identification. See *Henderson*, 27 A.3d at 918-22. Some jurisdictions have also interpreted state constitutions or statutes to provide greater protection against unreliable eyewitness identification. See O’Toole & Shay, *supra*, at 115 (citing Kansas, Massachusetts, New York, and Utah as examples of jurisdictions with such protections).

¹⁵⁸ See Cahn, *supra* note 149, at 167 (“It is one thing to use the current scientific findings . . . to ascertain whether the legislature has acted reasonably in adopting some scheme of social or economic regulation It would be quite another thing to have our fundamental rights rise, fall, or change along with the latest fashions of psychological literature.”); David M. O’Brien, *Of Judicial Myths, Motivations and Justifications: A Postscript on Social Science and the Law*, 64 JUDICATURE 285, 289 (1981) (questioning whether constitutional rights should depend upon the “latest public opinion survey”).

example, the Supreme Court will decide whether the Ex Post Facto Clause applies to the advisory Federal Sentencing Guidelines.¹⁵⁹ The petitioner presented data to show the effect of the Guidelines on sentencing.¹⁶⁰ The Solicitor General argued that the Court should ignore this statistical evidence because basing precedent on the data would “create the possibility that the Guidelines’ ex post facto status would fluctuate with each new set of data from the Sentencing Commission.”¹⁶¹ Ronald Dworkin provided a more general formulation of a similar argument. He wrote that “[c]orrelations of social phenomena are fragile in the sense that the data, the behaviour [of] which forms the correlation, can change very quickly.”¹⁶² He reasoned that, if the relevant empirical phenomenon changes, then so too must the rules based upon it.¹⁶³

Faigman has responded to this overturnability problem by arguing that it is merely temporary: “[S]ocial science will progress to a point where its theories will take into account the fluctuations of different variables and be able to predict outcomes on some well-corroborated theoretical basis.”¹⁶⁴ The theory is that, in the future, social science will be sufficiently robust to account for and predict the changes in underlying sociological patterns with sufficient accuracy to ensure that these changes will require no legal revisions. This is a tall order, and it is unlikely that any field in the social sciences will realize this achievement anytime soon.

The stronger counterargument focuses more closely on the logic underlying the alleged problem. Dworkin’s argument strangely neglects the idea that we care about social science because it informs us of the empirical facts essential to selecting the *right* rule. Indeed, when the underlying empirical facts change, it seems reasonable to change the rule based upon them. This is consistent with the framework the Supreme Court has adopted for overturning

¹⁵⁹ See Brief for the United States, *supra* note 106, at I (defining the question presented as “[w]hether the Ex Post Facto Clause required the district court to consult the version of the advisory Sentencing Guidelines in effect at the time of petitioner’s offenses, rather than the version in effect at the time of sentencing, in determining the appropriate sentence”).

¹⁶⁰ Brief of Petitioner at 20-31, *Peugh v. United States*, No. 12-62 (U.S. Dec. 26, 2012), 2012 WL 6755129.

¹⁶¹ Brief for the United States, *supra* note 106, at 49. At least one of the Justices, Justice Alito, appeared concerned by this objection at oral argument; he asked whether the case “would . . . come out differently” in twenty years if it turned out that only a “distinct minority of defendants are being sentenced within the guidelines.” See Transcript of Oral Argument at 15, *Peugh v. United States*, No. 12-62 (U.S. Feb. 26, 2013), available at http://www.supremecourt.gov/oral_arguments/argument_transcripts/12-62.pdf.

¹⁶² Dworkin, *supra* note 105, at 6.

¹⁶³ See *id.* (cautioning against relying on social science when constitutional rights are at issue because its use would risk unpalatable variability).

¹⁶⁴ Faigman, *supra* note 13, at 1044.

legal precedent, which considers whether the “facts have so changed . . . as to have robbed the old rule of . . . justification.”¹⁶⁵ Perhaps Dworkin was concerned about a situation in which the underlying social phenomenon changes so frequently that the administrative and information costs of repeatedly updating the rule would outweigh any benefits. If so, he is correct that, in these extreme situations, we should give up mapping the law to changes in the underlying empirical phenomena. But such situations are rare, and for the most part, it is reasonable to presume that the social phenomena relevant to judicial rulemaking are slow to change.

B. *Inconsistent Literatures*

Until now, I have assumed that the relevant social science literature is more or less internally consistent—that is, that studies generally point towards the same empirical answers. Of course, this assumption is implausible. Litigants often argue that a specific social science literature with inconsistent findings should not be relied upon in formulating judicial precedent.¹⁶⁶ In addition to the overturnability concerns discussed above,¹⁶⁷ inconsistent results pose at least two additional limitations on the development of judicial precedent.

First, in some cases, the findings of a body of empirical literature may be so inconsistent as to provide no helpful information regarding the empirical question faced by the court. For example, criminologists and economists have spent decades exploring the deterrent effect of the death penalty on crime, an empirical question that has received significant public attention.¹⁶⁸ In *Furman v. Georgia*, for example, the Supreme Court reviewed the constitutionality of the administration of the death penalty.¹⁶⁹ In dissent, Justice Powell denied the relevance of the empirical question of deterrence; he noted, “[L]egislative judgments as to the efficacy of particular

¹⁶⁵ *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 855 (1992).

¹⁶⁶ See, e.g., Reply Brief for Petitioner at 11, *Roper v. Simmons*, 543 U.S. 551 (2005) (No. 03-633), 2004 WL 2046818 (noting that the opposing party based its argument to revise Supreme Court precedent on the constitutionality of the death penalty for minors on empirical literature that has produced “inconsistent” rather than “uniform” findings); Brief of Respondent at 24, *Tucker v. State*, 965 A.2d 900 (Md. 2009) (No. 35), 2008 WL 5027087 (arguing that defendants are not entitled to cross-race jury instructions, at least partially because the results of the empirical literature on cross-race eyewitness identification are “inconsistent”).

¹⁶⁷ See *supra* subsections III.A.1–2.

¹⁶⁸ See, e.g., Adam Liptak, *Does Death Penalty Save Lives? A New Debate*, N.Y. TIMES, Nov. 18, 2007, at A1 (describing a renewed academic debate among empirical scholars regarding the deterrent effect of the death penalty).

¹⁶⁹ 408 U.S. 238 (1972) (per curiam).

punishments are presumptively rational.”¹⁷⁰ But he also drew the tentative conclusion that the death penalty exerts greater deterrence than other forms of punishment.¹⁷¹ In contrast, several concurring opinions placed a heavy emphasis on whether the death penalty deters. Justice Brennan, for example, asserted that the argument for the death penalty “is not based upon evidence that the threat of death is a superior deterrent. Indeed, . . . the available evidence uniformly indicates, although it does not conclusively prove, that the threat of death has no greater deterrent effect than the threat of imprisonment.”¹⁷² Similarly, Justice Marshall noted that “the question to be considered is not simply whether capital punishment is a deterrent, but whether it is a better deterrent than life imprisonment.”¹⁷³ Observing that the empirical question is especially difficult to resolve,¹⁷⁴ he conducted a detailed review of the available evidence¹⁷⁵ and concluded that “capital punishment cannot be justified on the basis of its deterrent effect.”¹⁷⁶

Forty years of subsequent research on deterrence has produced little conclusive evidence. According to a recent National Academy of Sciences report, the results of this literature vary widely: “Some studies conclude that executions save large numbers of lives; others conclude that executions actually increase homicides; and still others conclude that executions have no effect on homicide rate.”¹⁷⁷ These results are “striking” given the “similarity of the data and methods used across studies and the diversity of the results.”¹⁷⁸ To explain the divergent results, the report assesses the validity

¹⁷⁰ *Id.* at 456 (Powell, J., dissenting). Justice Powell was joined by Chief Justice Burger and Justices Blackmun and Rehnquist. *Id.*; see also *id.* at 375 (Burger, C.J., dissenting) (“Our constitutional inquiry, however, must be divorced from personal feelings as to the morality and efficacy of the death penalty, and be confined to the meaning and applicability of the uncertain language of the Eighth Amendment.”).

¹⁷¹ *Id.* at 454-55 (Powell, J., dissenting) (“*Prima facie* the penalty of death is likely to have a stronger effect as a deterrent to normal human beings than any other form of punishment, and there is some evidence (though no convincing statistical evidence) that this is in fact so. But this effect does not operate universally or uniformly, and there are many offenders on whom it is limited and may often be negligible.” (quoting JAMES CHUTER EDE, HOME SEC’Y, ROYAL COMMISSION ON CAPITAL PUNISHMENT 1949-1953 REPORT, 1953, [Cmd.] 8932, at 24 (U.K.))).

¹⁷² *Id.* at 301 (Brennan, J., concurring).

¹⁷³ *Id.* at 346-47 (Marshall, J., concurring).

¹⁷⁴ See *id.* at 347 (“There is no more complex problem than determining the deterrent efficacy of the death penalty.”).

¹⁷⁵ See *id.* at 345-54.

¹⁷⁶ *Id.* at 354.

¹⁷⁷ NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., DETERRENCE AND THE DEATH PENALTY 1 (Daniel S. Nagin & John V. Pepper eds., 2012).

¹⁷⁸ *Id.* at 47 (emphasis omitted).

of the statistical methods used in the death penalty literature.¹⁷⁹ Ultimately, the report concludes that several key methodological assumptions underlying all of the studies are “untenable” and help explain the discrepant findings.¹⁸⁰ The report discourages drawing policy judgments based on the death penalty literature.¹⁸¹ Thus, death penalty research offers an example of a literature so riddled with inconsistent findings that it may provide no valuable guidance to courts at all.

Second, other areas of the social science literature contain some inconsistent findings, but still can provide valuable insights for the development of judicial precedent. The expansive psychological literature on eyewitness identification, for example, suggests that identification under certain conditions is especially unreliable, but not all studies confirm these findings.¹⁸² An inconsistent literature, especially one containing a large number of studies, poses a special practical challenge for using social science in the development of judicial precedent. Most judges have little empirical training. Though some legal scholars have argued that many judges are nonetheless capable of critically assessing an empirical literature,¹⁸³ courts have

¹⁷⁹ See *id.* at 47-48 (“Given this diversity of results across and in some cases within studies, a central task for this committee is to assess the validity of the models used in the studies.”); see also *id.* at 54 (“In light of the variability in the estimated effects of the death penalty on homicide, a central question is whether the correct specification is being used and can be identified.”).

¹⁸⁰ *Id.* at 71.

¹⁸¹ *Id.* at 102 (“The committee concludes that research to date on the effect of capital punishment on homicide is not informative about whether capital punishment decreases, increases, or has no effect on homicide rates. Therefore, the committee recommends that these studies not be used to inform deliberations requiring judgments about the effect of the death penalty on homicide.” (emphasis omitted)).

¹⁸² See Kenneth A. Deffenbacher et al., *A Meta-Analytic Review of the Effects of High Stress on Eyewitness Memory*, 28 LAW & HUM. BEHAV. 687, 694, 695 tbl.1 (2004) (showing that most, though not all, studies examining the effect of stress on the reliability of eyewitness identification find that stress decreases the reliability); see also *State v. Marquez*, 967 A.2d 56, 77 (Conn. 2009) (noting that the “judgment of the relevant scientific community with respect to eyewitness identification procedures is far from universal”).

¹⁸³ See, e.g., Beecher-Monas, *supra* note 14, at 72 (noting in a discussion of the admissibility of scientific evidence that “judges can indeed learn to think like scientists, at least insofar as being able to recognize faulty logic when they hear it”); Faigman, *supra* note 2, at 604 (contending that “[e]mpirical research is simply not that difficult to understand” and that “the [Supreme] Court has repeatedly demonstrated the aptitude to use statistical data as well as to understand the essence of the scientific method” (footnote omitted)); Lochner, *supra* note 14, at 826-27 (“[T]he methodology of the social sciences [is not] impossible to understand Although a good deal of social science methodology is difficult to grasp—statistical testing, for example—even these subjects can be mastered with some effort. . . . [T]he social scientist’s work may be different in some respects from the attorney’s work, but it is surely not beyond his comprehension.”); Monahan & Walker, *supra* note 48, at 511 n.119 (“Acquiring the knowledge of social science necessary to evaluate most research studies is no more difficult than acquiring the knowledge of economics necessary to

expressed at least some difficulty in doing so.¹⁸⁴ And this challenge is nowhere greater than in the case of large and inconsistent literatures.

A number of common tools are available to help courts grapple with these kinds of complex social science literatures. First, scholars often publish systematic reviews in which the author collects all existing empirical studies on a particular research question, assesses their methodological validity, and draws conclusions about the strength of the findings with respect to a set of relevant hypotheses.¹⁸⁵ Scholars may sometimes conduct a more formal review of the literature through meta-analysis, a quantitative methodology that pools the results of multiple studies together to draw mathematical estimates about the distribution of the statistic of interest across studies.¹⁸⁶ Particularly for controversial or politically charged research areas, it can be helpful for a trusted and nonpartisan organization to perform the review. For example, the National Academy of Sciences, the preeminent authority on scientific research in the United States,¹⁸⁷ has commissioned reports on a range of empirical questions of legal interest, including those on the deterrent effect of the death penalty,¹⁸⁸ the effect of guns on crime,¹⁸⁹ and the reliability of forensic sciences.¹⁹⁰

One valuable benefit of published academic reviews that have undergone a peer review process is their scalability: if these reports are credible, courts across the country can rely upon the same report to guide their legislative factfinding. On the other hand, courts may sometimes face a new empirical question for which no review of the literature is yet available. In most cases,

adjudicate many antitrust cases Anyone who can comprehend the Federal Tort Claims Act can learn what standard deviation and statistical significance mean.”).

¹⁸⁴ See, e.g., *Craig v. Boren*, 429 U.S. 190, 204 (1976) (“It is unrealistic to expect . . . members of the judiciary . . . to be well versed in the rigors of experimental or statistical technique.”); *Vuyanich v. Republic Nat’l Bank of Dallas*, 505 F. Supp. 224, 258-59 (N.D. Tex. 1980) (asserting that courts lack “technical competence” to go beyond assessing the validity of “mathematical and statistical techniques”), *vacated*, 723 F.2d 1195 (5th Cir. 1984).

¹⁸⁵ See A.K. Akobeng, *Evidence Based Child Health 3: Understanding Systematic Reviews and Meta-Analysis*, 90 ARCHIVE DISEASE CHILDHOOD 845, 845 (2005) (noting that a systematic review involves “a comprehensive, exhaustive search for primary studies on a focused clinical question, selection of studies using clear and reproducible eligibility criteria, critical appraisal of primary studies for quality, and synthesis of results”).

¹⁸⁶ *Id.* at 845-46.

¹⁸⁷ See *What We Do*, NAT’L ACADS., <http://www.nas.edu/about/whatwedo/index.html> (last visited Feb. 4, 2013) (describing the purpose and status of the organization).

¹⁸⁸ See *supra* note 177 and accompanying text.

¹⁸⁹ NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., FIREARMS AND VIOLENCE: A CRITICAL REVIEW (Charles F. Wellford et al. eds., 2005).

¹⁹⁰ NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009) [hereinafter STRENGTHENING FORENSIC SCIENCE].

the traditional outlets of academic publication will not be able to respond in time to assist the court. The peer review and editorial process required by academic journals can take many months, and large reports by the National Academy of Sciences can take several years.¹⁹¹

Second, subject matter experts and research organizations can also provide guidance to courts on complex empirical literatures through amicus curiae briefs.¹⁹² Amicus briefs are more responsive to the immediate needs of courts as they can be researched, written, and filed within a shorter period of time than academic publications.¹⁹³ Of course, the streamlined process for submitting amicus briefs comes at a cost: without an oversight mechanism such as peer review, the briefs come with a higher risk of false or distorted representations of the empirical literature.¹⁹⁴ This risk is especially concerning given the increasing “open partisanship” of amicus briefs in recent years.¹⁹⁵ Some scholars have argued that professional social science associations should serve as “neutral expert amici” without advocating for a particular party. These “neutral” amicus briefs might provide courts with more reliable empirical guidance.¹⁹⁶ Of course, purportedly “neutral” amici may submit briefs that do not present a neutral discussion of the relevant scientific literature. Judges might encourage a stronger neutral commitment to the court by reaching out to a specific scientific expert or group of experts to serve as court-appointed amici in a particular case.

Third, a court can retain independent social science experts to review complex empirical literature and provide guidance to the court.¹⁹⁷ Scholars

¹⁹¹ For example, the federal government provided funding for the National Academy of Sciences to research and publish a report on the state of the forensic sciences in the United States in 2006. See *NIJ Awards in FY 2006 by Solicitation*, NAT'L INST. OF JUSTICE (Nov. 30, 2007), http://www.nij.gov/nij/funding/awards/2006_solicitation.htm. The report was published in 2009, three years later. STRENGTHENING FORENSIC SCIENCE, *supra* note 190.

¹⁹² See Rustad & Koenig, *supra* note 14, at 94 (“The most common method of introducing social science evidence to the [Supreme] Court is through . . . amicus curiae briefs.”).

¹⁹³ The Supreme Court, for example, imposes several different deadlines for amicus briefs, none of which exceeds sixty days. See SUP. CT. R. 37(2)(a).

¹⁹⁴ Rustad & Koenig, *supra* note 14, at 143-51 (describing the various ways in which partisan amicus curiae can provide a distorted representation of the research literature in order to advance their interests).

¹⁹⁵ *Id.* at 96-97.

¹⁹⁶ *Id.* at 153 (“Professional social science associations are a natural source for the neutral expertise the Court needs to assess competing social science claims. These organizations could be requested to file amicus curiae briefs in support of neither party to assist the Court.”).

¹⁹⁷ Under some circumstances, the use of independent social science experts might constitute a form of information flow to the court that could “sap the integrity and morale of the formal adversary system.” Miller & Barron, *supra* note 51, at 1189. One common proposal is for the court to notify the parties of social science evidence it is considering in resolving an issue of legislative

have proposed a variety of arrangements varying in scope and feasibility. Kenneth Culp Davis, for example, has argued that the Supreme Court should establish a permanent institution to serve as a research arm to the Court.¹⁹⁸ Perhaps less ambitiously, others have recommended that courts appoint a “panel of resident social scientists” to serve on a permanent basis.¹⁹⁹ Unless social scientists are willing to perform this work without pay, these proposals seem unrealistic, particularly for courts at lower levels of the judiciary.

Perhaps a more realistic strategy for lower courts would prioritize hiring one or more permanent staff attorneys with a background in empirical methods.²⁰⁰ All federal courts of appeals and some federal district courts and state courts employ staff attorneys who serve as clerks for the court as a whole.²⁰¹ Some positions are for limited terms while others are permanent.²⁰² Though duties vary by jurisdiction, staff attorneys generally perform the same functions as judicial clerks.²⁰³ After receiving a case, they review the lower court record, research relevant legal issues, and provide recommendations to the judge on disposition.²⁰⁴ Though staff attorneys frequently focus on pro se cases, they work on other kinds of cases as well.²⁰⁵ Thus, staff attorneys, and especially *permanent* staff attorneys, offer an opportunity to bring lawyers with empirical expertise into the court to assist a large number of judges in better understanding relevant social science research.

CONCLUSION

This Comment has considered the problem of suboptimal social science in the development of common law precedent. Scholars and litigants have

fact. This notification would enable the parties to bring “their experts into the evaluation process.” Monahan & Walker, *supra* note 48, at 509.

¹⁹⁸ See Jim Schachter, *High Court Needs Research Arm, Scholar Says*, L.A. TIMES, May 1, 1987, at A1 (describing a proposal presented by Davis during a lecture at the University of San Diego).

¹⁹⁹ See Miller & Barron, *supra* note 51, at 1240 (“The Court could appoint a panel of resident social scientists, who would be requested to investigate matters of legislative fact which appear to the Court to require further study.”).

²⁰⁰ I am grateful to Rob Friedman for a valuable conversation on this issue.

²⁰¹ JUDICIAL CLERKSHIP COMM., CORNELL LAW SCH., JUDICIAL CLERKSHIP HANDBOOK 4 (2012), available at <http://www.lawschool.cornell.edu/publicservice/Students/upload/2012-Clerkship-Handbook.pdf> (last visited Feb. 4, 2013).

²⁰² *Id.* at 4-5.

²⁰³ *Id.* at 4.

²⁰⁴ Elizabeth Armand & Malini Nangia, *Judicial Clerkships: Federal Staff Attorney Positions*, NALP BULL., Dec. 2008, available at http://www.nalp.org/uploads/federal_staff_atty_positions.pdf.

²⁰⁵ JUDICIAL CLERKSHIP HANDBOOK, *supra* note 201, at 4.

frequently argued that courts should ignore a particular social science literature in resolving a question of precedent due to a diverse range of problems with the literature. I have suggested that these reasons, on their own, are frequently insufficient to ignore the research, because the cited limitations appear to resurface even if the court chooses to ignore the literature. Without guidance from systematic data and social science research on complex empirical questions, judges must rely on their own empirical intuitions formed through a process that is typically subject to the same set of limitations.