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Inside the Judicial Mind

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INSIDE THE JUDICIAL MIND

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The quality of the judicial system depends upon the quality of decisions that judges make. Even the most talented and dedicated judges surely commit occasional mistakes, but the public understandably expects judges to avoid systematic errors. This expectation, however, might be unrealistic. Psychologists who study human judgment and choice have learned that people frequently fall prey to cognitive illusions that produce systematic errors in judgment. Even though judges are experienced, well-trained, and highly motivated decision makers, they might be vulnerable to cognitive illusions. We report the results of an empirical study designed to determine whether five common cognitive illusions (anchoring, framing, hindsight bias, the representativeness heuristic, and egocentric biases) would influence the decision-making processes of a sample of 167 federal magistrate judges. Although the judges in our study appeared somewhat less susceptible to two of these illusions (framing effects and the representativeness heuristic) than lay decision makers, we found that each of the five illusions we tested had a significant impact on judicial decision making. Judges, it seems, are human. Like the rest of us, their judgment is affected by cognitive illusions that can produce systematic errors in judgment.

INTRODUCTION

Alexander Hamilton observed that judges in a constitutional democracy possess "neither force nor will but merely judgment."[1] The

[1] THE FEDERALIST No. 78, at 437 (Alexander Hamilton) (Isaac Kramnick ed., 1987) ("[The judiciary] may truly be said to have neither force nor will but merely judgment; and must ultimately depend upon the aid of the executive arm even for the efficacy of its judgments.") (typeface altered).

judicial role has expanded since Hamilton's day,[2] but the institutional legitimacy of the judiciary still depends on the quality of the judgments that judges make. Even the most talented and dedicated judges surely commit occasional mistakes, but the public understandably expects judges to avoid systematic errors.[3] This expectation, however, might be unrealistic. Empirical evidence suggests that even highly qualified judges inevitably rely on cognitive decision-making processes that can produce systematic errors in judgment.

Legal scholars representing various schools of thought have long argued that judges do not merely find facts or apply legal principles in a completely accurate and unbiased fashion. Legal realists have argued that judges make choices that reflect their political ideology;[4] proponents of critical legal studies have complained that judges favor the existing power structure;[5] critical race and feminist scholars have argued that race and gender heavily influence judicial decisions;[6] and law-and-economics scholars have asserted that judges make self-serv-

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2 Judges now not only "adjudicat[e] the merits of issues presented to them by litigants" but also "meet[ ] with parties in chambers to encourage settlement of disputes and to supervise case preparation." Judith Resnik, *Managerial Judges*, 96 HARV. L. REV. 376, 376-77 (1982) [hereinafter Resnik, *Managerial Judges*]. *See generally* Judith Resnik, *Trial as Error, Jurisdiction as Injury: Transforming the Meaning of Article III*, 113 HARV. L. REV. 924 (2000) (documenting the changing role of the federal judiciary during the twentieth century).

3 *See* ROBERT E. KEETON, KEETON ON JUDGING IN THE AMERICAN LEGAL SYSTEM § 1.3.1 (1999) (noting that judges are obliged to make an "impartial application of principles"). Several economic models of adjudication demonstrate that substantive law can be implemented effectively even if judges make random mistakes. *See, e.g.*, Louis Kaplow, *The Value of Accuracy in Adjudication: An Economic Analysis*, 23 J. LEGAL STUD. 307, 311-23, 345-55 (1994); Louis Kaplow & Steven Shavell, *Accuracy in the Determination of Liability*, 37 J.L. & ECON. 1, 1-3 (1994); Eric A. Posner, *A Theory of Contract Law Under Conditions of Radical Judicial Error*, 94 NW. U. L. REV. 749, 767-69 (2000). Systematic errors, on the other hand, distort substantive law. *See* Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399, 406-08 (1973); Steven Shavell, *The Appeals Process as a Means of Error Correction*, 24 J. LEGAL STUD. 379, 425-26 (1995).

4 *See generally* JEROME FRANK, COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE (1949) (documenting the legal realist position on judging); Felix S. Cohen, *Transcendental Nonsense and the Functional Approach*, 35 COLUM. L. REV. 809, 846 (1935) (suggesting that "the political, economic, and professional background and activities of our various judges" are the "the motivating forces which mold legal decisions"). For a discussion of contemporary incarnations of legal realism, see Edward L. Rubin, *The New Legal Process, the Synthesis of Discourse, and the Microanalysis of Institutions*, 109 HARV. L. REV. 1393 (1996).

5 *See, e.g.*, MARK KELMAN, A GUIDE TO CRITICAL LEGAL STUDIES 45-48 (1987).

6 *See generally* Martha Chamallas & Linda K. Kerber, *Women, Mothers, and the Law of Fright: A History*, 88 MICH. L. REV. 814, 862-64 (1990) (arguing that the fact that virtually all nineteenth-century judges were men, while plaintiffs in certain types of cases were mostly women, influenced the development of tort law); Gregory C. Sisk, Michael Heise, & Andrew P. Morriss, *Charting the Influences on the Judicial Mind: An Empirical Study of Judicial Reasoning*, 73 N.Y.U. L. REV. 1377, 1385-88 (1998) (reviewing empirical research on race and gender biases in judges); Cassia Spohn, *The Sentencing Decisions of Black and White Judges: Expected and Unexpected Similarities*, 24 LAW & SOC'Y REV. 1197, 1198 (1990) (reviewing the critical race literature on judges).

ing decisions designed to advance their political fortunes.[7] Our research, however, identifies a more fundamental source of systematic judicial error: wholly apart from political orientation and self-interest, the very nature of human thought can induce judges to make consistent and predictable mistakes in particular situations.

Our thesis arises from psychological research on human judgment and choice. Psychologists have learned that human beings rely on mental shortcuts, which psychologists often refer to as "heuristics," to make complex decisions.[8] Reliance on these heuristics facilitates good judgment most of the time, but it can also produce systematic errors in judgment.[9] Just as certain patterns of visual stimuli can fool people's eyesight, leading them to see things that are not really there, certain fact patterns can fool people's judgment, leading them to believe things that are not really true.[10] Reliance on these heuristics can create *cognitive illusions* that produce erroneous judgments.[11]

Decades of research on *juries* indicates that cognitive illusions adversely affect the quality of adjudication.[12] Researchers have found, for example, that juries believe that litigants should have predicted events that no one could have predicted,[13] allow irrelevant or inadmissible information to influence liability determinations,[14] defer to arbi-

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7 *See generally* Jonathan R. Macey, *Judicial Preferences, Public Choice, and the Rules of Procedure*, 23 J. LEGAL STUD. 627, 630-32 (1994) (discussing the judiciary's "bureaucratic preferences"); Richard A. Posner, *What Do Judges and Justices Maximize? (The Same Thing Everybody Else Does)*, 3 SUP. CT. ECON. REV. 1 (1993) (reviewing judges' behavior using a "model in which judicial utility is a function mainly of income, leisure, and judicial voting"). *See generally* LAWRENCE BAUM, THE PUZZLE OF JUDICIAL BEHAVIOR (1997) (reviewing scholarship on judicial behavior).

8 Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1124 (1974). For a detailed description of this work, see JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982); *see also* SCOTT PLOUS, THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING 109-30, 145-52 (1993).

9 Tversky & Kahneman, *supra* note 8, at 1124 ("In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors.").

10 *Id.*

11 *Id.*

12 *See* Robert J. MacCoun, *Experimental Research on Jury Decision-Making*, 244 SCIENCE 1046 (1989) (reviewing research on juries).

13 *See* Reid Hastie, David A. Schkade, & John W. Payne, *Juror Judgments in Civil Cases: Hindsight Effects on Judgments of Liability for Punitive Damages*, 23 LAW & HUM. BEHAV. 597, 609 (1999); Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post ≠ Ex Ante: Determining Liability in Hindsight*, 19 LAW & HUM. BEHAV. 89, 99 (1995); Susan J. LaBine & Gary LaBine, *Determinations of Negligence and the Hindsight Bias*, 20 LAW & HUM. BEHAV. 501, 510-12 (1996); Merrie Jo Stallard & Debra L. Worthington, *Reducing the Hindsight Bias Utilizing Attorney Closing Arguments*, 22 LAW & HUM. BEHAV. 671, 680-81 (1998).

14 *See* Mark Kelman, Yuval Rottenstreich, & Amos Tversky, *Context-Dependence in Legal Decision Making*, 25 J. LEGAL STUD. 287, 295-97 (1996) (demonstrating that the addition of a clearly inferior third verdict option alters choices made by mock jurors); Stanley Sue, Ronald E. Smith, & Cathy Caldwell, *Effects of Inadmissible Evidence on the Decisions of Simulated Jurors: A Moral Dilemma*, 3 J. APPLIED SOC. PSYCHOL. 345, 350-51 (1973); William C. Thomp-

trary numerical estimates,[15] and rely on incoherent methods to calculate damages.[16]

But what about judges? In the day-to-day operation of the legal system, judges are much more important than juries.[17] They decide roughly as many cases at trial as juries do,[18] they determine the outcome of roughly seven times as many cases as juries by ruling on dispositive motions, and they often play an active role in settling cases.[19] Even in those cases that juries decide, judges preside. They determine what evidence juries will be allowed to hear and interpret and instruct juries on the law they are to apply. Therefore, understanding judicial decision making is the key to understanding the outcome of particular cases and the development of law. As Jerome Frank put it, if judicial decisions are "based on judge's hunches, then the way in which the judge gets his hunches is the key to the judicial process. Whatever produces the judge's hunches *makes the law.*"[20]

Despite the important role that judges play in the courtroom, psychologists have focused their research efforts almost exclusively on juries. Consequently, as several judges themselves have complained, few systematic studies of judicial decision making exist.[21] Most of the em-

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son, Geoffrey T. Fong, & D. L. Rosenhan, *Inadmissible Evidence and Juror Verdicts*, 40 J. PERSONALITY & SOC. PSYCHOL. 453, 457-62 (1981); Sharon Wolf & David A. Montgomery, *Effects of Inadmissible Evidence and Level of Judicial Admonishment to Disregard on the Judgments of Mock Jurors*, 7 J. APPLIED SOC. PSYCHOL. 205, 212-16 (1977).

15 *See* Gretchen B. Chapman & Brian H. Bornstein, *The More You Ask For, the More You Get: Anchoring in Personal Injury Verdicts*, 10 APPLIED COGNITIVE PSYCHOL. 519, 525-28, 532-33 (1996); Reid Hastie, David A. Schkade, & John W. Payne, *Juror Judgments in Civil Cases: Effects of Plaintiff's Requests and Plaintiff's Identity on Punitive Damage Awards*, 23 LAW & HUM. BEHAV. 445, 463-65 (1999); Verlin B. Hinsz & Kristin E. Indahl, *Assimilation to Anchors for Damage Awards in a Mock Civil Trial*, 25 J. APPLIED SOC. PSYCHOL. 991, 1009-10, 1016 (1995); John Malouff & Nicola S. Schutte, *Shaping Juror Attitudes: Effects of Requesting Different Damage Amounts in Personal Injury Trials*, 129 J. SOC. PSYCHOL. 491, 495 (1989); Allan Raitz, Edith Greene, Jane Goodman, & Elizabeth F. Loftus, *Determining Damages: The Influence of Expert Testimony on Jurors' Decision Making*, 14 LAW & HUM. BEHAV. 385, 390-94 (1990); *see also* VALERIE P. HANS & NEIL VIDMAR, JUDGING THE JURY 80 (1986) (reporting an experiment in which a mock jury appeared extremely susceptible to a damage amount suggested by an attorney).

16 *See* Cass R. Sunstein, Daniel Kahneman, & David Schkade, *Assessing Punitive Damages (with Notes on Cognition and Valuation in Law)*, 107 YALE L.J. 2071, 2100-04 (1998).

17 *See* RONALD DWORKIN, LAW'S EMPIRE 1 (1986) ("It matters how judges decide cases").

18 Kevin M. Clermont & Theodore Eisenberg, *Trial By Jury or Judge: Transcending Empiricism*, 77 CORNELL L. REV. 1124, 1127 n.7 (1992); *see also* LEONIDAS RALPH MECHAM, JUDICIAL BUSINESS OF THE UNITED STATES COURTS: 1999 ANNUAL REPORT OF THE DIRECTOR 172-74 tbl.C-7 (1999).

19 Marc Galanter, *Real World Torts: An Antidote to Anecdote*, 55 MD. L. REV. 1093, 1100 n.17 (1996) (estimating that 7% of cases end in trials and 24% are decided on dispositive motions). If half of the 7% of trials are jury trials, then juries decide 3.5% of all cases, while 24% are decided on dispositive motions.

20 JEROME FRANK, LAW AND THE MODERN MIND 104 (1930) (emphasis added).

21 *See, e.g.*, John J. Brunetti, *Searching for Methods of Trial Court Fact-Finding and Decision-Making*, 49 HASTINGS L.J. 1491, 1491 (1998) ("Like many new judges, I try to read as much

pirical work on judicial decision making has been motivated by concerns that judges make decisions that are self-serving or politically driven.[22] Few have dealt with the sources of judicial error.[23] As a result of the scarcity of research on the topic, even the most learned judges have acknowledged that they do not understand how judges make decisions.[24]

Psychologists suspect that even though judges are experienced, well-trained, and highly motivated decision makers, they are vulnerable to cognitive illusions.[25] Research on human judgment and choice indirectly supports this suspicion. Empirical studies demonstrate that cognitive illusions plague assessments that many professionals, including doctors, real estate appraisers, engineers, accountants, options

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as I can about the judicial process. I was disappointed to find that while much has been written about judicial philosophies of famous appellate court judges and their modes of decision making, little has been written about trial court fact-finding."); Donald C. Nugent, *Judicial Bias*, 42 CLEV. ST. L. REV. 1, 4 (1994) (noting with surprise that "few studies analyze the manner and method of the judiciary's decision-making process"); Walter V. Schaefer, *Precedent and Policy*, 34 U. CHI. L. REV. 3, 23 (1966) (bemoaning the legal profession's lack of "techniques and tools which are sensitive enough to explore the mind of man and report accurately its conscious and subconscious operations"); Andrew J. Wistrich, *How Cognitive Illusions Can Affect Legal Decision Making*, LITIG. SEC. NEWSLETTER FOR THE CIV. TRIAL LAW., Fall 1999, at 2, 5 ("Very little research has been done regarding the susceptibility of judges to cognitive illusions."). *But see* John C. Anderson, D. Jordan Lowe, & Philip M.J. Reckers, *Evaluation of Auditor Decisions: Hindsight Bias Effects and the Expectation Gap*, 14 J. ECON. PSYCHOL. 711, 725-27 (1993) (reporting a study of judges that tested for hindsight bias); Theodore Eisenberg, *Differing Perceptions of Attorney Fees in Bankruptcy Cases*, 72 WASH. U. L.Q. 979, 982-89 (1994) (reporting the results of a study of the incidence of egocentric bias among bankruptcy judges and lawyers); Reid Hastie & W. Kip Viscusi, *What Juries Can't Do Well: The Jury's Performance as a Risk Manager*, 40 ARIZ. L. REV. 901, 904-08 (1998) (discussing the results of a study of the behavior of judges and mock jurors); Stephen Landsman & Richard F. Rakos, *A Preliminary Inquiry into the Effect of Potentially Biasing Information on Judges and Juries in Civil Litigation*, 12 BEHAVIORAL SCI. & L. 113 (1994) (reporting results of experiment suggesting that judges and jurors may be similarly influenced by exposure to potentially biasing information); Jennifer K. Robbennolt, *Punitive Damage Decision Making: The Decisions of Citizens and Trial Court Judges*, 25 LAW & HUM. BEHAV. (forthcoming 2001) (reporting results of study comparing damage awards of jury-eligible citizens and trial court judges); W. Kip Viscusi, *How Do Judges Think About Risk?* 1 AM. L. & ECON. REV. 26 (1999) (reporting results of a study of judges' biases); Roselle L. Wissler, Allen J. Hart, & Michael J. Saks, *Decisionmaking About General Damages: A Comparison of Jurors, Judges, and Lawyers*, 98 MICH. L. REV. 751, 776, 786 (1999) (studying the factors that contribute to judges' assessments of the severity of injuries and judges' awards for damages); Marianne M. Jennings, D. Jordan Lowe, & Philip M.J. Reckers, Outcome Foreseeability and Its Effects on Judicial Decisions (unpublished manuscript, on file with authors) (reporting a study of the effects of hindsight bias on judges).

22 *See* BAUM, *supra* note 7, at 89-124 (reviewing studies of the strategy behind judicial decision making); Sisk et al., *supra* note 6, at 1385-96 (reviewing empirical studies of the influence of judges' race, sex, and political orientation on judicial decision making).

23 The recent paper by Viscusi, *supra* note 21, is a notable exception.

24 *See, e.g.*, Oliver Wendell Holmes, Jr., *The Path of the Law*, 10 HARV. L. REV. 457, 466 (1897) (noting that the basis for judicial decision making often "lies [in] inarticulate and unconscious judgment"); Schaefer, *supra* note 21, at 22 (stating that judges "lack the ability to describe what happens" when they make decisions).

25 *See* HANS & VIDMAR, *supra* note 15, at 247-48.

traders, military leaders, and psychologists, make.[26] Even lawyers fall prey to cognitive illusions.[27] Inasmuch as "[j]udging is choice,"[28] the conclusions drawn from psychological research on human judgment and choice likely apply to judges as well.[29] Furthermore, judges make decisions under uncertain, time-pressured conditions that encourage reliance on cognitive shortcuts that sometimes cause illusions of judgment. Nevertheless, without empirical evidence, the assertion that cognitive illusions affect judges remains mere conjecture.

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26 *See* Anderson et al., *supra* note 21, at 725 (noting that professional auditors are subject to the hindsight bias); Hal R. Arkes, David Faust, Thomas J. Guilmette, & Kathleen Hart, *Eliminating the Hindsight Bias*, 73 J. APPLIED PSYCHOL. 305, 306 (1988) (demonstrating that psychologists exhibit the hindsight bias); Hal R. Arkes, Robert L. Wortmann, Paul D. Saville, & Allan R. Harkness, *Hindsight Bias Among Physicians Weighing the Likelihood of Diagnoses*, 66 J. APPLIED PSYCHOL. 252, 253 (1981) (indicating that "physicians exhibited the hindsight bias"); Loren J. Chapman & Jean P. Chapman, *Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs*, 74 J. ABNORMAL PSYCHOL. 271 (1969) (demonstrating that various heuristics inspire erroneous beliefs in psychotherapists); Craig R. Fox, Brett A. Rogers, & Amos Tversky, *Options Traders Exhibit Subadditive Decision Weights*, 13 J. RISK & UNCERTAINTY 5, 16 (1996) (finding that option traders rely on heuristics in probabilistic reasoning); Raanon Lipshitz & Dalya Barak, *Hindsight Wisdom: Outcome Knowledge and the Evaluation of Decisions*, 88 ACTA PSYCHOLOGICA 105, 121-23 (1995) (demonstrating that officers in the Israeli defense forces commit the hindsight bias); Barbara J. McNeil, Stephen G. Pauker, Harold C. Sox, Jr., & Amos Tversky, *On the Elicitation of Preferences for Alternative Therapies*, 306 NEW ENG. J. MED. 1259, 1261-62 (1982) (finding that physicians are susceptible to framing effects); Gregory B. Northcraft & Margaret A. Neale, *Experts, Amateurs, and Real Estate: An Anchoring-and-Adjustment Perspective on Property Pricing Decisions*, 39 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 84, 95-96 (1987) (reporting that real estate agents fall prey to anchoring effects when estimating real estate prices); *see also* PLOUS, *supra* note 8, at 258 ("[S]everal studies have found that experts display either roughly the same biases as college students or the same biases at somewhat reduced levels." (citations omitted)).

27 *See, e.g.*, Linda Babcock, Henry S. Farber, Cynthia Fobian, & Eldar Shafir, *Forming Beliefs about Adjudicated Outcomes: Perceptions of Risk and Reservation Values*, 15 INT'L REV. L. & ECON. 289, 296-97 (1995) (finding that framing effects had a similar impact on lawyer and nonlawyer subjects); Craig R. Fox & Richard Birke, Lawyers Exhibit Subadditivity when Forecasting Trial Outcomes (unpublished manuscript, on file with authors) (demonstrating that lawyers exhibit decision-making biases when assessing probabilities). *But see* Russell Korobkin & Chris Guthrie, *Psychology, Economics, and Settlement: A New Look at the Role of the Lawyer*, 76 TEX. L. REV. 77, 99-101 (1997) (reporting that lawyers are less susceptible than nonlawyers to framing effects); Darrin R. Lehman, Richard O. Lempert, & Richard E. Nisbett, *The Effects of Graduate Training on Reasoning*, 43 AM. PSYCHOL. 431, 440 (1988) (finding that training in psychology, medicine, and law can improve logical decision making).

28 KEETON, *supra* note 3, § 1.1.

29 *See, e.g.*, MORRIS R. COHEN, LAW AND THE SOCIAL ORDER: ESSAYS IN LEGAL PHILOSOPHY 337 (1933) (explaining that "we must not forget that actual law is a human product—made and administered by judges who are not free from human limitations in intelligence and goodwill"); FRANK, *supra* note 20, at 100 (arguing that to understand judicial decisions "we must observe how ordinary men dealing with ordinary affairs arrive at their judgments"); Robert M. Cover, *Forward: Nomos and Narrative*, 97 HARV. L. REV. 4, 67 (1983) (noting that judges are "like the rest of us"); Richard A. Posner, *The Jurisprudence of Skepticism*, 86 MICH. L. REV. 827, 859 (1988) (noting that "[t]here is no distinctive methodology of legal reasoning").

To explore the influence of cognitive illusions on judicial decision making, we conducted an empirical study. In our study, we sought to determine whether five common cognitive illusions influence the way judges make decisions using a sample of 167 federal magistrate judges. We tested for the influence of: anchoring (making estimates based on irrelevant starting points); framing (treating economically equivalent gains and losses differently); hindsight bias (perceiving past events to have been more predictable than they actually were); the representativeness heuristic (ignoring important background statistical information in favor of individuating information); and egocentric biases (overestimating one's own abilities). We found that each of these cognitive illusions influenced the decision-making processes of the judges in our study. Although the judges displayed less vulnerability to two of the five illusions than other experts and laypersons, the results demonstrate that under certain circumstances judges rely on heuristics that can lead to systematically erroneous judgments. In short, our study provides empirical support for Jerome Frank's assertion that "[w]hen all is said and done, we must face the fact that judges are human."[30]

The results of our research raise questions for judges, litigants, and the justice system as a whole. For example: what steps, if any, can judges take to improve their decision making? Should they take these steps? Does judicial susceptibility to cognitive illusions affect the optimal allocation of decision-making responsibility between judges and juries? Should courts or legislatures adopt rules of civil procedure, rules of evidence, or substantive legal standards designed to minimize the adverse effects of cognitive illusions on the quality of judicial decision making? Have they done so already?

After describing our methodology in Part I and presenting our results in Part II, we explore these questions in Part III. We conclude on a hopeful note. Although the evidence we present indicates that judges commit predictable errors of judgment, we are optimistic that judges, litigants, and legislatures can take steps–and in some instances, already have taken steps–to avoid or minimize the impact of such errors.

I
THE STUDY

A. Participants

We recruited 167 federal magistrate judges to participate in our study. Congress created the modern office of the federal magistrate

30 FRANK, *supra* note 4, at 410.

judge when it enacted the Federal Magistrates Act of 1968.[31] Although the role that magistrate judges play varies from district to district, they perform many (although not all) of the functions federal district judges perform.[32] Over the years, Congress has steadily increased the responsibilities that magistrate judges may undertake, which now include the power to conduct civil trials with the litigants' consent.[33] In 1999, the 519 federal magistrate judges handled 282,933 preliminary criminal proceedings,[34] 63,931 civil pre-trial conferences,[35] and entered final judgment in 11,320 cases litigated by consent in front of magistrate judges (approximately 1500 of which resulted in trials).[36]

Federal magistrate judges are selected by a careful appointment process designed to be based on merit. To obtain eight-year, renewable appointments, candidates for federal magistrate judgeships are evaluated by "merit selection panels" charged with "identifying and recommending persons who are best qualified to fill such positions."[37] Based on these recommendations, the district judges in the relevant district vote for their preferred applicant.[38] The appointment process reflects an effort to identify and appoint skilled decision makers.

Although the entire sample of judges who graciously agreed to participate in our study were federal magistrate judges, we do not believe that our results are in any way unique to this group. Like other state and federal judges, magistrate judges typically enjoyed successful careers in law practice. Some have had prior judicial experience. Our sample was drawn from a large group of magistrate judges attending

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31 Federal Magistrates Act, Pub. L. No. 90-578, 82 Stat. 1107 (1968) (codified as amended at 28 U.S.C. §§ 631-639 (1994)).

32 *See* R. Lawrence Dessem, *The Role of the Federal Magistrate Judge in Civil Justice Reform*, 67 ST. JOHN'S L. REV. 799, 834 (1993). For more background on federal magistrate judges, see generally CARROLL SERON, THE ROLES OF MAGISTRATES IN FEDERAL DISTRICT COURTS (1983) (reporting survey results documenting the work performed by magistrates); CARROLL SERON, THE ROLES OF MAGISTRATES: NINE CASE STUDIES (1985) (describing several different approaches to the use of magistrate judges); CHRISTOPHER E. SMITH, UNITED STATES MAGISTRATES IN THE FEDERAL COURTS: SUBORDINATE JUDGES (1990) (providing an empirical analysis of the role of magistrate judges). However, there are functions reserved exclusively to federal district judges—most notably, conducting felony criminal trials.

33 28 U.S.C. § 636(c) (1994 & Supp. IV 1998); FED. R. CIV. PROC. 73. More recently, the Civil Justice Reform Act of 1990, further expanded the power Federal Magistrates Judges enjoy. Pub. L. No. 101-650, tit. 1, 104 Stat. 5089, 5090-93 (codified as amended at 28 U.S.C. §§ 471-473 (1994)); *see* Dessem, *supra* note 32, at 811-32 (exploring the impact of the Civil Justice Reform Act on the use of magistrate judges); Philip M. Pro & Thomas C. Hnatowski, *Measured Progress: The Evolution and Administration of the Federal Magistrate Judges System*, 44 AM. U. L. REV. 1503, 1520-22 (1995) (describing the increased role of magistrate judges in the wake of the Civil Justice Reform Act).

34 MECHAM, *supra* note 18, at 351 tbl.M-3.

35 *Id.* at 357 tbl.M-4A.

36 *Id.* at 360 tbl.M-5.

37 28 U.S.C. § 631(b)(5).

38 28 U.S.C. § 631(a).

an educational conference, who had no special interest in psychology or psychological research. Additionally, a handful of other studies have shown that cognitive illusions affect judges of all kinds.[39]

B. Procedure

The magistrate judges who participated in our study did so as part of the Federal Judicial Center's Workshop for Magistrate Judges II in New Orleans in November 1999. At this workshop, we presented the opening panel, entitled "Psychology of Judging." Before beginning our panel presentation, we randomly distributed differing versions of a five-page questionnaire to the judges in attendance.[40] We asked the judges to read the questionnaire, to respond to each of the questions, and to refrain from discussing the questionnaire until after we retrieved the completed questionnaires from all of the participants. We did not ask the judges to identify themselves on the questionnaire, so all responses were anonymous.

The five-page questionnaire began with a paragraph-long set of instructions. In it, we asked the judges to read and respond to the questions independently, informed the judges that participation in the study was voluntary, and explained that we intended to use the aggregate responses to illustrate points during our presentation.[41] On the subsequent pages, the questionnaire presented each judge with five items, consisting of a background description and one or more questions. Each item tested for the influence of one of the five cognitive illusions described below.[42] To create controlled experimental conditions, we devised multiple variations of three of the items tested (though the first page of the questionnaire gave no indication of this).[43]

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39 *See* studies cited *infra* note 201.

40 The Psychology of Judging, questionnaire from the Federal Judicial Center Workshop for Untied States Judges II (Nov. 9, 1999) (on file with authors).

41 Under the boldface heading, "Workshop for U.S. Magistrate Judges, The Psychology of Judging, Judicial Survey," we provided the following instructions:

> Many of the points discussed by this panel are best understood if experienced directly. We therefore ask that before the session starts, you read and respond to each of the questions enclosed in this survey (although doing so is voluntary, of course). Please do so independently and *please do not discuss the surveys with others while you are responding to the questions.* We shall collect these surveys before the discussion and present the results during the panel session.

42 *See infra* Part II.

43 The items designed to test for framing effects and anchoring each consisted of two different conditions, and the item designed to test for the hindsight bias consisted of three different conditions. The other two items were uniform. All twelve possible combinations of the three variable items were created. Thus, judges received one of the twelve different questionnaires. The order of the items was also uniform.

The fifth and final page of the questionnaire gave the judges the opportunity to choose to limit the use of their answers to the educational workshop, excluding them from further analysis or publication.[44] One judge out of the 168 who returned questionnaires chose to exercise this option, so we removed that questionnaire from consideration in this Article, leaving a sample of 167 judges.

Completing the questionnaire took approximately ten minutes. During its administration, the judges remained in the room, kept silent, and appeared to take the process seriously. We have no way of knowing for sure how many, if any, of the judges refused to return their questionnaires, but we believe most of the judges in attendance completed them and turned them in. The room, which was nearly full, seated a maximum of two hundred persons. In all, the sample of 167 judges comprised nearly one-third of the 519 federal magistrate judges on the bench at the time.[45]

II
RESULTS

We designed the questionnaires to assess the influence of the following five common cognitive illusions on judicial decision making: anchoring, framing, hindsight bias, the representativeness heuristic, and egocentric biases. These illusions are among the most well documented in the psychological literature on judgment and choice and they have been shown to affect litigants, lawyers, and the legal system as a whole. We found that these cognitive illusions also affect the legal system's most important and powerful actors: judges.

A. Anchoring

When people make numerical estimates (e.g., the fair market value of a house), they commonly rely on the initial value available to them (e.g., the list price). That initial value tends to "anchor" their

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44 The text on the last page read as follows:

> Please note: This survey is designed to illustrate the psychological phenomena being discussed by this panel. The panelists will present aggregate results during the discussion. The panelists, however, would also like the opportunity to comment respectfully on the aggregate results of this survey at other public presentations and possibly in published works. In no way will individual participants be identified as part of any discussion of the results of this survey. (Identifying information is not even being collected.) If, for any reason, you object to the use of the results of this survey in any forum other than the present panel, please indicate so by circling this paragraph and your survey will be removed from any further analysis or discussion.

45 MECHAM, *supra* note 18, at 44 (reporting that in the fall of 1999, there were 65 part-time and 454 full-time federal magistrate judges).

final estimates.[46] In many situations, reliance on an anchor is reasonable because many anchors convey relevant information about the actual value of an item (although people might rely too heavily on anchors). The problem, however, is that anchors that do not provide any information about the actual value of an item also influence judgment.

In one early study of anchoring, Professors Amos Tversky and Daniel Kahneman asked participants to estimate the percentage of African countries in the United Nations.[47] Before asking for this estimate, they informed the participants that the number was either higher or lower than a numerical value identified by the spin of a "wheel of fortune."[48] Tversky and Kahneman had secretly rigged this "wheel of fortune" to stop either on ten or sixty-five.[49] When the wheel landed on ten, participants provided a median estimate of 25%; when the wheel landed on sixty-five, participants provided a median estimate of 45%.[50] Even though the initial values were clearly irrelevant to the correct answer, the initial values had a pronounced impact on the participants' responses.[51]

Anchors affect judgment by changing the standard of reference that people use when making numeric judgments. Anchors induce people to consider seriously the possibility that the real value is similar to the anchor, thereby leading them to envision circumstances under which the anchor would be correct.[52] Even when people conclude that an anchor provides no useful information, mentally testing the validity of the anchor causes people to adjust their estimates upward or downward toward that anchor. As a consequence, even extreme, wholly absurd anchors can affect judgment. For example, students provided higher estimates of the average price of a college textbook when they were first asked to determine whether it was higher or lower than $7128.53.[53] This anchor, although ridiculously high, forces students to consider the possibility that textbook pricetags are higher than they might have otherwise believed. Similarly, people provided higher estimates of the average annual temperature in San Francisco when first asked to determine whether it was higher or

46 Tversky & Kahneman, *supra* note 8, at 1128-30 (defining and explaining anchoring effects).

47 *Id.* at 1128.

48 *Id.*

49 *Id.*

50 *Id.*

51 Tversky and Kahneman also used other number pairs and asked subjects to estimate other quantities in this "wheel of fortune" experiment. *Id.*

52 Fritz Strack & Thomas Mussweiler, *Explaining the Enigmatic Anchoring Effect: Mechanisms of Selective Accessibility*, 73 J. PERSONALITY & SOC. PSYCHOL. 437, 437-39 (1997).

53 PLOUS, *supra* note 8, at 146 (referring to an unpublished study by George Quattrone and colleagues).

lower than 558 degrees.[54] Such a high anchor induces people to consider the possibility that the real average is quite high.

Litigation frequently produces anchors.[55] In settlement talks, for instance, litigants can be influenced by the opening offers that their adversaries make. Professors Russell Korobkin and Chris Guthrie found that people evaluating hypothetical settlement offers were more likely to accept a $12,000 final settlement offer when it followed a $2000 opening offer than when it followed a $10,000 opening offer.[56] Korobkin and Guthrie hypothesized that those who received the $2000 opening offer expected to settle for a relatively small amount, so the $12,000 final offer seemed generous by comparison.[57] On the other hand, those who received the $10,000 opening offer expected to settle for relatively more, so the $12,000 final offer seemed relatively stingy.[58] The opening offers effectively "anchored subjects' expectations" and influenced their settlement preferences.[59]

Legal scholars have long thought that anchors influence jurors.[60] In five separate studies, researchers have found that plaintiffs' lawyers' damage requests influenced mock jurors' assessments of the appropriate amount of damages to award in civil suits.[61] In one study, for instance, mock jurors awarded slightly more than $90,000 when the plaintiff's lawyer requested $100,000 in damages; but when the plaintiff's lawyer requested $500,000 in damages in the very same case, mock jurors awarded nearly $300,000.[62] Even silly and outrageous damage requests can influence juror decision making. For example, mock jurors in another study awarded the plaintiff substantially more in damages when the plaintiff's lawyer requested an outlandish $1 billion than when the plaintiff's lawyer requested a more plausible amount.[63] The moral of these anchoring studies seems to be, "Ask

54 *Id.*

55 *See generally* Wistrich, *supra* note 21 (describing the impact anchoring can have in the courtroom).

56 Russell Korobkin & Chris Guthrie, *Opening Offers and Out-of-Court Settlement: A Little Moderation May Not Go a Long Way*, 10 OHIO ST. J. ON DISP. RESOL. 1, 12-13 (1994).

57 *Id.*

58 *Id.*

59 *Id.*

60 *See* Dale W. Broeder, *The University of Chicago Jury Project*, 38 NEB. L. REV. 744, 756 (1959) (reporting that interviews conducted with jurors revealed that plaintiff's damage requests anchored juror damage determinations in six of seven cases).

61 *See* Chapman & Bornstein, *supra* note 15, at 526-27; Hastie et al., *supra* note 15, at 463; Hinsz & Indahl, *supra* note 15, at 1009; Malouff & Schutte, *supra* note 15, at 495; Raitz et al., *supra* note 15, at 393.

62 Malouff & Schutte, *supra* note 15, at 495 tbl.1.

63 Chapman & Bornstein, *supra* note 15, at 525-26.

and ye shall receive." In each, "when more money was requested for damages by the plaintiff's attorney, the jurors awarded more."[64]

Recognition of the potentially pernicious effect of anchoring on damage awards has triggered calls for reform.[65] Some of these reform efforts have included suggestions to replace juries with judges,[66] presumably on the theory that judges will be immune from anchoring effects. Indeed, because experience can mitigate the influence of arbitrary anchors,[67] there is reason to believe that this presumption might be accurate.

1. *Anchoring: Our Materials*

To test whether judges' damage determinations might be influenced by anchoring effects, we presented each of the judges with the following description of a serious personal injury suit in which only damages were at issue:

> Suppose that you are presiding over a personal injury lawsuit that is in federal court based on diversity jurisdiction. The defendant is a major company in the package delivery business. The plaintiff was badly injured after being struck by one of the defendant's trucks when its brakes failed at a traffic light. Subsequent investigations revealed that the braking system on the truck was faulty, and that the truck had not been properly maintained by the defendant. The plaintiff was hospitalized for several months, and has been in a wheelchair ever since, unable to use his legs. He had been earning a good living as a free-lance electrician and had built up a steady base of loyal customers. The plaintiff has requested damages for lost wages, hospitalization, and pain and suffering, but has not specified an amount. Both parties have waived their rights to a jury trial.

We randomly assigned the judges to either a "No Anchor" condition or an "Anchor" condition. We provided judges in the No Anchor group with the paragraph above and asked them, "how much would

64 Malouff & Schutte, *supra* note 15, at 495. Researchers have found not only that the plaintiff's requests for damages can anchor jurors but also that statutory damage caps can anchor jurors. *See, e.g.*, Hinsz & Indahl, *supra* note 15, at 1001-06; Jennifer K. Robbennolt & Christina A. Studebaker, *Anchoring in the Courtroom: The Effects of Caps on Punitive Damages*, 23 LAW & HUM. BEHAV. 353, 361 (1999). Statutory damage caps can also lead to anchoring and adjustment effects in settlement. *See, e.g.*, Linda Babcock & Greg Pogarsky, *Damage Caps and Settlement: A Behavioral Approach*, 28 J. LEGAL STUD. 341, 362-68 (1999).

65 Sunstein et al., *supra* note 16, at 2109-30 (explaining the susceptibility of juries to anchoring effects and suggesting reforms).

66 *Id.* at 2127 (finding that of the proposed reforms, an "incremental shift from jury to judicial determinations of punitive damages appears to be the most promising").

67 *See* Clark McCauley, Margo Durham, John B. Copley, & John P. Johnson, *Patients' Perceptions of Treatment for Kidney Failure: The Impact of Personal Experience on Population Predictions*, 21 J. EXPERIMENTAL SOC. PSYCHOL. 138, 141-44 (1985) (demonstrating that people rely on anchors derived from personal experience).

you award the plaintiff in compensatory damages?" We provided the judges in the Anchor condition with the same information. In addition, we informed the subjects in the Anchor condition that "[t]he defendant has moved for dismissal of the case, arguing that it does not meet the jurisdictional minimum for a diversity case of $75,000."[68] We asked these judges to rule on the motion, and then asked them "[i]f you deny the motion, how much would you award the plaintiff in compensatory damages?" Because the plaintiff clearly had incurred damages greater than $75,000, the motion was meritless. Nevertheless, we hypothesized that the $75,000 would serve as an anchor, resulting in lower damage awards from those judges who first ruled on the motion.

2. *Anchoring: Results*

Ruling on the motion had a large effect on damage awards. The sixty-six judges in the No Anchor condition indicated that they would award plaintiff an average of $1,249,000 while the fifty judges in the Anchor condition awarded an average of $882,000.[69] The difference between the two groups was statistically significant.[70]

Only two (2.3%) of the judges in the Anchor condition granted the motion to dismiss.[71] By voting overwhelmingly to deny the motion to dismiss, the judges indicated that the $75,000 jurisdictional mini-

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68 *See* 28 U.S.C. § 1332 (1994 & Supp. IV 1998) (providing that in diversity cases, the federal district courts "have original jurisdiction of all civil actions where the matter in controversy exceeds the sum or value of $75,000").

69 The response rate differed between the two conditions. Excluding the two judges who granted the motion, 31.1% (or 51 out of 164) of the judges declined to answer the question, many citing a lack of adequate information. Without the preliminary motion, only 17.5% (14 of the 80 who did not rule on the motion) of the judges failed to provide an estimate, but of those judges asked to rule on the motion first, 44% (37 of the 84 judges that denied the motion) declined to answer. The difference in response rate was significant. $z = 3.43$, $p < .001$. How this difference might have affected the results (or why it occurred) is unclear.

Throughout this Article, we reserve the term "significant" or "significance" to denote the statistical rejection of the null hypothesis that two variables are not related at a probability of 5% or less. *See* WILLIAM L. HAYS, STATISTICS 230-66 (3d ed. 1981) (explaining the logic of statistical hypothesis testing). In all cases, we report the *p*-value, which is the measure of the likelihood that the null hypothesis can be correctly rejected. We use the following four different statistical tests in this Article: Fisher's exact test for measures of association between two binary variables, as reported with the *z*-score, *see id.* at 552-54; the *t*-test for differences between two parametric samples, as reported with the *t*-statistic, *see id.* at 271-300; the Mann-Whitney test for differences between two nonparametric samples, as reported with the Mann-Whitney *U* (adjusted for ties in all cases), *see id.* at 587-89; and the χ^2 test for different distributions of categorical data, as reported with the χ^2 square statistic, *see id.* at 305-13.

70 $t(113) = 2.18$, $p = .031$.

71 One of these two judges asserted that they wanted the plaintiff to amend the complaint to specify an amount. One of the 87 judges in the Anchor condition did not respond to the question about the motion, citing insufficient information.

mum contained no reliable information regarding the plaintiff's damages. Nonetheless, the $75,000 jurisdictional minimum anchored their damage awards. In this hypothetical case, asking the judges to rule on this frivlous motion depressed average damage awards by more than $350,000 (or 29.4%).

Like most damage-award data, our results were positively skewed; most awards were low, but a small number of awards were markedly higher than the rest. Because such skewed results can render mean results unreliable, we report the median and quartile statistics in Table 1:[72]

TABLE 1: ANCHORING: QUARTILE RESULTS

Condition	1st Quartile (25th percentile)	2nd Quartile (median)	3d Quartile (75th percentile)
No Anchor	$500,000	$1,000,000	$1,925,000
Anchor	$288,000	$882,000	$1,000,000

The motion had a pronounced effect on the judges at all response levels. At the first and third quartiles, for example, judges assigned to the Anchor condition awarded roughly half the damages awarded by judges assigned to the No Anchor condition (i.e., $288,000 vs. $500,000 and $1 million vs. $1.925 million). Also, three-quarters of the judges in the Anchor condition awarded damages that were lower than half of those awarded by the judges in the No Anchor condition.

3. *Anchoring: Discussion*

The judges in our study relied on an anchor—the $75,000 jurisdictional minimum raised by the motion to dismiss—to estimate damage awards in a hypothetical personal-injury case. Ruling on this motion might have caused the judges to consider the possibility that the true damages in this case were exceptionally low. If so, the judges would have been thinking about cases in which the maximum awards are quite low when they made their damage estimates. Consequently, they might have mentally filled in the factual gaps in our hypothetical with details that would have made an award greater than $75,000 implausible, thereby producing comparatively low damage estimates. A process like this would be consistent with the research on how anchoring works.

Alternatively, judges in our study might have believed that the anchor signaled relevant information. They might, for example, have

72 A non-parametric test (more appropriate to positively skewed data such as ours) also revealed that the damage estimates in the two conditions differed significantly. Mann-Whitney, $U = 4216.5$, $p = .048$.

reasoned that a defendant would have been more inclined to file such a motion in a case where the damages were actually low. (The opposite inference might, in fact, be more plausible, inasmuch as frivolous motions are usually designed to delay an adverse outcome, such as a high damage award.) If the judges believed this, then it might have been reasonable for them to infer from the motion that the defendant believed that the damages were low. The psychological literature on anchoring, however, combined with the magnitude of the difference between the Anchor and No Anchor groups in our study, suggests that anchoring provides a better account of our results than does this alternative explanation.

The susceptibility of judges to anchoring effects does not suggest that defendants should file motions to dismiss for lack of subject-matter jurisdiction as a way of anchoring judges in actual cases. Not only are frivolous motions subject to sanctions,[73] but these motions would not necessarily anchor judges in actual cases. In an actual case, the judge would dispose of this type of a motion long before awarding damages. This temporal separation of the motion from the determination of the damage award would dull any anchoring effect the motion might otherwise have. Furthermore, several other anchors would likely be available at trial. Although we do not entirely discount the possible effects that such motions might have on judicial thought processes, we recognize that many other factors might affect the outcome.

Rather than suggesting a disingenuous litigation strategy, these data show how easily anchors can creep into the process and affect the way judges think about damage awards. Commentators have worried about the effects of plaintiffs' damage requests on juries,[74] but our data suggest that these damage requests might also affect judges. The potential for statutory damage caps to anchor judges is equally troubling. Judges might be able to keep juries ignorant of damage caps,[75] but they obviously cannot blind themselves to the caps. Ironically, then, the best way to prevent a statutory damage cap from anchoring a damage award might be to vest that decision-making power in a jury that is ignorant of the cap.

The potentially pernicious effects of anchoring also suggest a source of error in both the civil and criminal justice systems. In civil cases, the influence on judges of misleading anchors, such as litigants'

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73 28 U.S.C. § 1927 (1994) (authorizing fee and cost shifting against litigants who unreasonably multiply proceedings); FED. R. CIV. P. 11 (providing for sanctions against parties who file frivolous motions).

74 *See supra* notes 60-64 and accompanying text.

75 It is also possible, however, that jurors might be aware of—or, even worse, misinformed about—a damage cap.

requests for damage awards, can produce biased damage awards. In criminal cases, the influence on judges of biased or misleading anchors, such as prosecutor or defense attorney sentencing recommendations, can produce biased criminal sentences. In both cases, constraints, such as damage caps or mandatory sentencing guidelines, might reduce the influence that biased or irrelevant anchors can have on judicial damage awards and sentences. For example, criminal sentencing guidelines that constrain the range of available sentences based on factors such as a defendant's criminal conduct will provide stable, unbiased anchors. Instead of the potentially biased recommendations from attorneys, the sentencing guidelines will provide judges with a neutral source of anchors. Although judges may bristle at the constraint on their discretion that sentencing guidelines impose, these guidelines reduce the influence of potentially biased anchors. Sentencing guidelines (and damage caps), however, can also inappropriately skew criminal sentences (and damage awards) if they provide anchors that are unrelated to an appropriate sentence (and damage award).

B. Framing

When people confront risky decisions—such as deciding whether to settle a case or to proceed to trial—they categorize their decision options as potential gains or losses from a salient reference point such as the status quo.[76] This categorization, or "framing," of decision options influences the way people evaluate options and affects their willingness to incur risk. People tend to make risk-averse decisions when choosing between options that appear to represent gains and risk-seeking decisions when choosing between options that appear to represent losses.[77] For example, most people prefer a certain $100 gain to a 50% chance of winning $200 but prefer a 50% chance of losing $200 to a certain $100 loss.[78]

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76 *See generally* Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 AM. PSYCHOLOGIST 341 (1984) (discussing the psychological phenomenon of framing); Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979) [hereinafter Kahneman & Tversky, *Prospect Theory*] (same); Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCIENCE 453 (1981) [hereinafter Tversky & Kahneman, *Framing of Decisions*] (same); Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. BUS. S251 (1986) [hereinafter Tversky & Kahneman, *Rational Choice*] (same).

77 *See* Kahneman & Tversky, *Choices, Values, and Frames*, *supra* note 76, at 342-44; Kahneman & Tversky, *Prospect Theory*, *supra* note 76, at 268-69; Tversky & Kahneman, *Framing of Decisions*, *supra* note 76, at 453-55; Tversky & Kahneman, *Rational Choice*, *supra* note 76, at S257-60.

78 *See* Amos Tversky & Daniel Kahneman, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, 5 J. RISK & UNCERTAINTY 297, 308 tbl.4 (1992).

From a rational-choice perspective, people's risk preferences should depend upon their wealth relative to the size of the stakes involved.[79] In practice, however, people tend not to make such normatively appropriate calculations. Instead, people make choices designed to maintain or slightly improve the status quo, which translates into risk-averse choices for most gains and risk-seeking choices for most losses.[80]

Framing can have a profound impact on civil lawsuits because litigation produces a natural frame.[81] In most lawsuits, plaintiffs choose either to accept a certain settlement from the defendant or to gamble, hoping that further litigation will produce a larger gain. Most defendants, by contrast, choose either to pay a certain settlement to the plaintiff or to gamble that further litigation will reduce the amount that they must pay. Thus, plaintiffs often choose between options that appear to represent gains, while defendants often choose between options that appear to represent losses. As such, plaintiffs are more likely to prefer settlement, the risk-averse option, while defendants are more likely to prefer trial, the risk-seeking option.[82]

To demonstrate this phenomenon, Jeffrey Rachlinski presented a simple litigation problem to law students, half of whom played the role of plaintiff and half of whom played the role of defendant.[83] Plaintiff-subjects faced a choice between a certain $200,000 settlement offer and a 50% chance of winning $400,000 at trial (and a corresponding 50% chance of winning nothing), while defendant-subjects faced a choice between paying a $200,000 settlement to plaintiff and facing a 50% chance of losing $400,000 at trial (and a 50% chance of losing nothing).[84] Rachlinski found that 77% of plaintiff-subjects (choosing between gains), but only 31% of defendant-subjects (choosing between losses), preferred settlement.[85] Rachlinski and others have generated additional experimental data demonstrating these

79 John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279, 279-80 (1973).

80 Tversky & Kahneman, *Rational Choice*, *supra* note 76, at S257-60.

81 Jeffrey J. Rachlinski, *Gains, Losses, and the Psychology of Litigation*, 70 S. CAL. L. REV. 113, 129 (1996).

82 In frivolous or low-probability litigation, by contrast, litigants' risk preferences are reversed. *See* Chris Guthrie, *Framing Frivolous Litigation: A Psychological Theory*, 67 U. CHI. L. REV. 163, 185-95 (2000). In frivolous cases, plaintiffs typically choose between options that appear to represent *low-probability* gains, while defendants choose between options that appear to represent *low-probability* losses. *Id.* at 187. Decision makers selecting between low-probability gains tend to make risk-seeking choices, while those selecting between low-probability losses tend to make risk-averse choices. *See* Tversky & Kahneman, *supra* note 78, at 306. Thus, in frivolous or low-probability litigation, plaintiffs are relatively more inclined to go to trial than are defendants. Guthrie, *supra*, at 187.

83 Rachlinski, *supra* note 81, at 128-29.

84 *Id.* at 128.

85 *Id.* at 128-29.

framing effects,[86] and Rachlinski has also found evidence of framing effects among litigants in real cases.[87] Taken together, this work provides powerful support for the proposition that plaintiffs are generally more likely than defendants to find settlement attractive because of the way litigants frame their decision options.[88]

1. *Framing: Our Materials*

Judges, of course, are neither plaintiffs nor defendants in the typical civil suit, but they often play an active role in supervising settlement talks. Does framing lead judges to perceive the settlement decisions of plaintiffs and defendants differently? To determine whether framing might impact judges' settlement recommendations, we presented each of the judges with a hypothetical fact pattern labeled "Suit and Settlement." This item included, for all judges, the following description of a lawsuit:

> Imagine that you are presiding over a case in which a plaintiff has sued a defendant for $200,000 in a copyright action. Both the plaintiff and the defendant are mid-sized publishing companies with annual revenues of about $2.5 million per year. They are represented by competent attorneys who have not tried cases before you in the past. You believe that the case is a simple one, but it presents some tough factual questions. There is no dispute as to the amount at stake, only as to whether the defendant's actions infringed on the plaintiff's copyright. You believe that the plaintiff has a 50% chance of recovering the full $200,000 and a 50% chance of recovering $0. You expect that should the parties fail to settle, each will spend approximately $50,000 at trial in litigation expenses. Assume that there is no chance that the losing party at trial will have to compensate the winner for these expenses.

In the second paragraph of this item, the judges learned that, "[t]he case is approaching a trial date and you have scheduled a settlement conference." Half of the judges ("Plaintiff/Gains" condition) reviewed the case from the plaintiff's perspective, in which the choices involved potential gains. These judges read the following: "You have learned that the defendant intends to offer to pay the plaintiff $60,000 to settle the case. Do you believe that the plaintiff should be

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86 *Id.* at 135-44. For similar research, see Babcock et al., *supra* note 27, at 296-97; Robin M. Hogarth, *Ambiguity and Competitive Decision Making: Some Implications and Tests*, 19 ANNALS OPERATIONS RES. 31, 40-41 (1989); Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. L. REV. 107, 30-42 (1994); Korobkin & Guthrie, *supra* note 27, at 96-101; Peter J. van Koppen, *Risk Taking in Civil Law Negotiations*, 14 LAW & HUM. BEHAV. 151, 158-64 (1990).

87 Rachlinski, *supra* note 81, at 150-60.

88 *But see* Guthrie, *supra* note 82, at 185-95 (discussing experiments demonstrating that plaintiffs are more likely than defendants to resist settlement in frivolous or low-probability cases).

willing to accept $60,000 to settle the case?" Thus, the judges learned that the plaintiff faced a choice between a certain $60,000 gain or an expected trial outcome of $50,000 (i.e., 50% x $200,000 judgment + 50% x $0 judgment - $50,000 attorney's fees = $50,000).

The other half of the judges ("Defendant/Losses" condition) reviewed the case from the defendant's perspective, in which the choices involved potential losses. These judges read the following: "You have learned that the plaintiff intends to offer to accept $140,000 to settle the case. Do you believe that the defendant should be willing to pay $140,000 to settle the case?" Thus, the judges assigned to this condition learned that the defendant faced a choice between a certain $140,000 loss or an expected trial outcome of -$150,000 (i.e., 50% x - $200,000 judgment + 50% x $0 judgment - $50,000 attorney's fees = -$150,000). All judges were then asked to circle "Yes"or "No."

We presented judges in both conditions with economically identical choices to evaluate. In a copyright dispute like this one, the judge must decide who owns a sum of money generated by a piece of intellectual property. Settling this sort of dispute requires the judge to help the parties decide how to divide that fixed pie. Regardless of whether they were assigned to the plaintiff or to the defendant frames, the judges assessed a litigant confronted with a choice between obtaining $60,000 of the earnings for sure, or a gamble with an expected value of only $50,000. The only difference between the two conditions was the status quo, that is, which party held the $200,000 sum at the outset of the lawsuit.

2. *Framing: Results*

The results varied by frame. Among the judges evaluating the case from the plaintiff's perspective, 39.8% (thirty-three out of eighty-three) indicated that they thought the plaintiff should accept the $60,000 settlement offer, but only 25% (twenty out of eighty) of the judges evaluating the case from the defendant's perspective indicated that they thought the defendant should pay the $140,000 settlement payment proposed by plaintiff.[89] The difference between these two groups was statistically significant.[90] Thus, like litigants, judges appear to be influenced by the way decision problems are framed.

3. *Framing: Discussion*

The framing of the settlement decision affected judges in our study. Although the hypothetical litigants in this problem faced settle-

89 Four judges (two in each condition) out of 167 (2.4%) declined to respond.

90 $z = 1.99$, $p = .047$.

ment offers that were identical in terms of their expected value, the materials created the illusion that the plaintiff faced a choice between potential gains and that the defendant faced a choice between potential losses. From the plaintiff's perspective, settlement seemed relatively more attractive, while from the defendant's perspective, trial seemed relatively more attractive, even though the two perspectives presented identical economic choices.

Framing can detrimentally impact judicial management of lawsuits. Judges, who frequently serve as mediators during conferences, have the power to influence the settlement process.[91] If framing affects judges' assessments of which party should make greater concessions to settle a case, then framing favors defendants. Even though the data on settlement show that defendants seem most resistant to settlement and would thus benefit most from judicial encouragement to settle,[92] the data in our study suggest that judges are likely to lean more heavily on plaintiffs than on defendants. By urging plaintiffs to accept less than is appropriate or by failing to urge defendants to pay an appropriate amount, judges might settle fewer cases than they otherwise would or might promote settlements that undercompensate plaintiffs and underdeter defendants.

Framing also has influenced the development of legal doctrine.[93] When ownership of a commodity is in doubt, the courts traditionally favor those who hold possession of the good—even when possession is arbitrary.[94] For example, if a seller contracts to sell a car to two different buyers, courts will often award permanent ownership to the party holding possession at the time the suit is brought.[95] Several areas of law, in fact, create similarly arbitrary distinctions between gains and losses.[96] While these distinctions might be inconsistent with an economic approach they are consistent with framing effects. The judges who created the rules giving rise to these disparities may have done so out of an implicit belief that gains should be treated differently from losses.

Interestingly, apart from framing effects, a majority of the judges (67.5%, or 110 out of 163) felt that the parties should decline to settle, despite the fact that settlement offers from both the plaintiff's and defendant's perspectives exceeded the expected value of trial. This unexpected result might indicate that judges are relatively more risk-

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91 *See* Resnik, *Managerial Judges*, *supra* note 2, at 386-402 (illustrating situations in which judges might influence litigation).

92 Rachlinski, *supra* note 81, at 159-60.

93 *See* David Cohen & Jack L. Knetsch, *Judicial Choice and Disparities Between Measures of Economic Values*, 30 OSGOODE HALL L.J. 737, 749-69 (1992).

94 *See id.* at 738.

95 *Id.* at 738-39.

96 *See, e.g., id.* at 751-69.

seeking (or trial-seeking) than others. We suspect, however, that another psychological explanation accounts for this finding. Although it is true that the settlement offers exceeded the expected benefits of litigation for both parties, they also represented only a fraction of the potential settlement value available.[97] For either party, accepting the settlement would effectively concede 70% of the property's value to the opposing party.[98] Because the facts suggest that each party has an equivalent claim to the property, the judges may have felt that an even split was more appropriate. In experiments in which participants must arbitrarily split a fixed pie, researchers have consistently found that people consider anything other than an equal split unfair.[99] Judges in our study responded much like participants in these studies. This result suggests that litigants trying to negotiate a settlement with the assistance of a mediator should justify their settlement proposals in terms of fairness not merely economic rationality.

C. Hindsight Bias

Hindsight vision is 20/20. People overstate their own ability to have predicted the past and believe that others should have been able to predict events better than was possible.[100] Psychologists call this tendency for people to overestimate the predictability of past events the "hindsight bias."[101] It occurs because learning an outcome causes people to update their beliefs about the world.[102] People then rely on these new beliefs to generate estimates of what was predictable, but they ignore the change in their beliefs that learning the outcome inspired.[103]

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97 As discussed above, risk-neutral defendants should have been willing to settle for any amount less than $150,000; risk-neutral plaintiffs should have been willing to settle for any amount greater than $50,000. The attorney's fees of $50,000 for each side effectively create a bargaining window of between $50,000 and $150,000. The $60,000 offer to the plaintiff thus represents one tenth of the bargaining window, as does the $140,000 offer for the defendant.

98 If the plaintiff accepts defendant's $60,000 offer, the defendant will retain $140,000 of the $200,000 in dispute (i.e., 70%). If the defendant agrees to pay plaintiff $140,000, the plaintiff will obtain $140,000 of the $200,000 in dispute (i.e., 70%).

99 *See generally* Colin Camerer & Richard H. Thaler, *Ultimatums, Dictators and Manners*, J. ECON. PERSP., Spring 1995, at 209 (describing this research).

100 Baruch Fischhoff, *For Those Condemned to Study the Past: Heuristics and Biases in Hindsight*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 335, 341 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982).

101 Stephen J. Hoch & George F. Loewenstein, *Outcome Feedback: Hindsight and Information*, 15 J. EXPERIMENTAL PSYCHOL.: LEARNING MEMORY & COGNITION 605, 605 (1989); *see also* Baruch Fischhoff, *Hindsight ≠ Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPERIMENTAL PSYCHOL.: HUM. PERCEPTIONS & PERFORMANCE 288 (1975) (first documenting the effects of hindsight on judgment empirically).

102 *See* Scott A. Hawkins & Reid Hastie, *Hindsight: Biased Judgments of Past Events After the Outcomes Are Known*, 107 PSYCHOL. BULL. 311, 312-13 (1990).

103 *See id.*

Few judgments in ordinary life require people to assess the predictability of past outcomes, but such judgments are pervasive in the law.[104] Several studies have demonstrated that the hindsight bias influences judgments of legal liability.[105] Kim Kamin and Jeffrey Rachlinski, for example, compared foresight decisions regarding whether to take a precaution against flooding with comparable hindsight evaluations of whether the failure to take this precaution was negligent.[106] They instructed participants judging in foresight to recommend the precaution if they believed that the flood was more than 10% likely to occur in any given year (which was based on a cost-benefit comparison of the precaution and the damage that a flood would likely cause).[107] The researchers told the participants judging in hindsight that the precaution had not been taken and that a flood causing $1 million in damage had occurred.[108] They instructed these participants to find the defendant liable for the flood if the likelihood of the flood, from the perspective of the defendant before the fact, was greater than 10% in any given year.[109] Although both sets of participants reviewed identical information about the likelihood of a flood, the participants reached different conclusions about appropriate defendant behavior.[110] Only 24% of foresight participants concluded that the likelihood of a flood justified taking the precaution, while 57% of the hindsight participants concluded that the flood was so likely that the failure to take the precaution was negligent.[111] Because of the hindsight bias, the decision to refrain from taking the precaution seemed reasonable to most participants ex ante, but it seemed unreasonable to most participants ex post.

Because courts usually evaluate events after the fact, they are vulnerable to the hindsight bias.[112] Besides negligence determinations, the hindsight bias likely influences claims of ineffective assistance of counsel (decisions a lawyer makes in the course of representing a criminal defendant can seem less competent after the defendant has been convicted), the levying of sanctions under Rule 11 of the Federal Rules of Civil Procedure (a motion or allegation seems less meritorious after a court rejects it), and assessments of the liability of corpo-

104 *See* Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 571 (1998).

105 *See* Hastie et al., *supra* note 13 at 605-09; Kamin & Rachlinski, *supra* note 13, at 98-99; LaBine & LaBine, *supra* note 13, at 509-11; Stallard & Worthington, *supra* note 13, at 677-81.

106 Kamin & Rachlinski, *supra* note 13, at 93.

107 *Id.* at 97.

108 *Id.* at 95-96.

109 *Id.* at 97.

110 *Id.* at 94-99.

111 *Id.* at 98.

112 *See* Rachlinski, *supra* note 104, at 588-90.

rate officers charged with making false predictions about their company's performance (which can look like fraud after the predictions fail to come true).[113] In short, the hindsight bias is a threat to accurate determinations in many areas of law.

Recognition of the influence of the hindsight bias on legal judgments has also inspired a set of proposed reforms,[114] which include greater reliance on judges.[115] This approach is unlikely to be successful, however, because the hindsight bias is one of the most robust cognitive illusions. Greater reliance on judges is unlikely to eliminate its effect on adjudication.[116] Although experience reduces the effect of the hindsight bias somewhat,[117] it does not eliminate it.

1. *Hindsight Bias: Our Materials*

To test whether judges are susceptible to the hindsight bias, we presented each of the judges who participated in our study with a hypothetical fact pattern based on an actual case,[118] labeled "Likely Outcome of Appeal":

> In 1991, a state prisoner filed a *pro se* Section 1983 action in Federal District Court against the Director of the Department of Criminal Justice in his state, asserting, among other things, that the prison had provided him with negligent medical treatment in violation of Section 1983. The district court dismissed his complaint on the ground that the provision of negligent medical care does not violate Section 1983. The district court further found that the plaintiff knew his claims were not actionable because he had made similar claims several years earlier in a case that had been dismissed by the court. Thus, the district court sanctioned the plaintiff pursuant to Rule 11, ordering him to obtain the permission of the Chief

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113 *See generally id.* at 602-24 (reviewing applications of the hindsight bias to legal issues).

114 Hal R. Arkes & Cindy A. Schipani, *Medical Malpractice v. the Business Judgment Rule: Differences in Hindsight Bias*, 73 OR. L. REV. 587, 630-36 (1994); Christine Jolls, Cass R. Sunstein, & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1527-33 (1998).

115 *See* Viscusi, *supra* note 21, at 60 (discussing various proposals to give judges more authority over damages); *see also* Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477, 1500-02 (1999) (describing perceived differences between the decisions of juries and judges).

116 *See* Hoch & Loewenstein, *supra* note 101, at 606 ("[H]indsight bias is a robust phenomenon that is not easily eliminated or even moderated." (citation omitted)). Even the standard-bearer for economic analysis in the judiciary, Judge Richard Posner, has confessed that he worries about the effects of the hindsight bias on his thought process. RICHARD A. POSNER, AN AFFAIR OF STATE: THE INVESTIGATION, IMPEACHMENT, AND TRIAL OF PRESIDENT CLINTON 2 (1999).

117 *See* Jay J.J. Christensen-Szalanski & Cynthia Fobian Willham, *The Hindsight Bias: A Meta-Analysis*, 48 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 147, 155 (1991).

118 Mendoza v. Lynaugh, 989 F.2d 191 (5th Cir. 1993).

Judge in the district before filing any more claims. The plaintiff appealed the district court's decision.

We randomly assigned the judges to one of three conditions: the "Lesser Sanction" condition; the "Affirmed" condition; or the "Vacated" condition. Judges in each condition learned of a different outcome on appeal:

- "Lesser Sanction": "The court of appeals ruled that the district court had abused its discretion under Rule 11 and remanded the case for imposition of a less onerous Rule 11 sanction against the plaintiff."
- "Affirmed": "The court of appeals affirmed the district court's decision to impose this Rule 11 sanction on the plaintiff."
- "Vacated": "The court of appeals found that the district court had abused its discretion and vacated the Rule 11 sanction against the plaintiff."

We asked all of the judges, regardless of the condition to which they were assigned, to predict which of the three actions the court of appeals was most likely to have taken—that is, affirm, vacate, or remand for lesser sanctions. The materials asked: "In light of the facts of the case, as described in the passage above, which of the following possible outcomes of the appeal was most likely to have occurred (assume that the three outcomes below are the only possible ones)?" The materials then listed the three possible outcomes. If the judges in our sample were immune from the influence of the hindsight bias, learning the outcome should not have affected their identification of the outcome most likely to have occurred.

2. *Hindsight Bias: Results*

Knowing the outcome significantly affected judges' assessments.[119] Table 2, below, shows that judges informed of a particular outcome were much more likely than the other judges to have identified that outcome as the most likely to have occurred.[120] Consider, for example, the judges' assessment of the likelihood that the court of appeals would affirm the district court's decision. When told that the court of appeals had affirmed, 81.5% of the judges indicated that they would have predicted that result. By contrast, only 27.8% of those told the court of appeals had vacated, and only 40.4% of those told the court of appeals had remanded for imposition of a lesser sanction, indicated that an affirmance was the most likely outcome. Learning

119 $\chi^2(4) = 46.91$, $p < .001$.

120 One of the fifty-eight judges in the "Lesser" condition declined to respond to this question, one of the fifty-five judges in the "Affirm" condition declined to respond, and all of the fifty-four judges in the "Vacate" condition responded.

of an outcome ex ante clearly influenced the judges' ex post assessments of the likelihood of various possible outcomes.

TABLE 2: HINDSIGHT BIAS: PERCENTAGE OF JUDGES IDENTIFYING EACH OUTCOME AS THE MOST LIKELY, BY CONDITION

Outcome Provided	% Selecting as Most Likely Outcome		
	Lesser	Affirmed	Vacated
Lesser	**38.6**	40.4	21.1
Affirmed	7.4	**81.5**	11.1
Vacated	20.4	27.8	**51.9**

Note: Boldface numbers indicate the percentage of judges identifying the given outcome as the most likely.

The sum of the percentage of judges in each of the three conditions who selected the outcome that they were told had occurred as the "most likely to have occurred" was 172%. It would have been 100% if learning the outcome had had no effect on the judges. Thus, the judges exhibited a predictable hindsight bias; when they learned that a particular outcome had occurred, they were much more likely to identify that outcome as the most likely to have occurred.

3. *Hindsight Bias: Discussion*

Learning the alleged outcome on appeal influenced the judges' assessments of which outcome had been the most likely. Whether they were aware of it or not, the judges' judgments in hindsight were influenced by knowledge that they could not have had in foresight.

Some have argued that results such as ours do not really reflect an illusion of judgment but reflect a rational use of new knowledge.[121] Proponents of these arguments misunderstand the nature of the hindsight bias. The hindsight bias does not consist of using known outcomes to update one's beliefs about future events;[122] that process is simply learning from experience, which is perfectly rational. Rather, the hindsight bias consists of using known outcomes to assess the predictability at some earlier time of something that has already happened. When we asked the judges in our study to determine what appellate outcome they would have predicted, the outcome that we provided to them was irrelevant. Nevertheless, learning the outcome changed the judges' beliefs about Rule 11 sanctions in a pro se pris-

121 Mark Kelman, David E. Fallas, & Hilary Folger, *Decomposing Hindsight Bias*, 16 J. RISK & UNCERTAINTY 251, 253-54 (1998); Posner, *supra* note 115, at 1528 ("[H]indsight bias is often rational.").

122 Hawkins & Hastie, *supra* note 102, at 311.

oner case because the judges relied on this new information to re-predict the past outcome.

Some might criticize the form of our question because we did not specifically ask the judges to disregard what they had learned but instead asked them only what they thought was the most likely outcome. Nevertheless, the questions are formally identical because determining what one would have predicted requires ignoring what one already knows. The questions are also functionally identical, as several studies of the hindsight bias reveal.[123] For example, studies have found that asking (as we did) "what was most likely" produces identical results to asking "what would you have predicted had you not known the outcome" and "what would others who have not been told the outcome have predicted."[124] Furthermore, our findings are consistent with other studies showing that judges are vulnerable to the hindsight bias.[125]

Our conclusion that the hindsight bias misleads judges has anecdotal support in some published judicial opinions. For example, the law governing trusts includes an infamous opinion in which a court held a trustee liable for failing to sell stock before the stock market crash of 1929.[126] The court reasoned that "[i]t was common knowledge, not only amongst bankers and trust companies, but the general public as well, that the stock market condition at the time of [the] testator's death was an unhealthy one, that values were very much inflated and that a crash was almost sure to occur."[127] Obviously, the court's ex post assessment of the ex ante likelihood of the crash was influenced by being aware of the crash. In other similar cases, courts have held trustees liable for investing in a company in spite of "'disquieting information' contained in a prospectus"[128] for selling securities at the "bottom of the market."[129] How the trustees in these cases were supposed to have known that the disquieting information was more predictive than the positive signals that the prospectus included or that a stock price had actually reached bottom is unclear. The defendants in these cases were victims of the hindsight bias.

When predicting the likelihood of something after the fact, judges cannot help but rely on facts that were unavailable before the fact. Judges' susceptibility to the hindsight bias is troubling because judges are frequently expected to suppress their knowledge of some

123 *Id.* at 314-16.

124 *See* Fischhoff, *supra* note 101, at 293-95.

125 Anderson et al., *supra* note 21, at 730; Viscusi, *supra* note 21, at 55; Jennings et al., *supra* note 21.

126 *In re* Chamberlain, 156 A. 42, 42 (N.J. Prerog. Ct. 1931).

127 *Id.* at 43.

128 Chase v. Peaver, 419 N.E.2d 1358, 1368 (Mass. 1981).

129 First Nat'l Bank v. Martin, 425 So. 2d 415, 428 (Ala. 1982).

set of facts before making decisions. When deciding whether to suppress evidence found during a police search, for example, judges are expected to ignore their knowledge of the outcome of the search for purposes of determining whether the police had probable cause to conduct the search. When assessing the reasonableness of precautions taken by a tort defendant, judges are expected to disregard their knowledge of the plaintiff's ensuing injury. Although we did not test the operation of the hindsight bias on judicial decision making in these circumstances, our results suggest that judges are vulnerable to the influence of the hindsight bias in these and other contexts.

D. Representativeness Heuristic

When people make categorical judgments (e.g., assessing the likelihood that a criminal defendant is guilty), they tend to base their judgments on the extent to which the evidence being analyzed (e.g., the defendant's demeanor) is representative of the category.[130] When the evidence appears representative of, or similar to, the category (e.g., defendant is nervous and shifty), people judge the likelihood that the evidence is a product of that category as high (i.e., evidence of guilt). When the evidence being analyzed does not resemble the category (e.g., defendant appears at ease), people judge the likelihood that the evidence is a product of that category as low (i.e., evidence of innocence). Psychologists refer to this phenomenon as the "representativeness heuristic."[131]

Although the representativeness heuristic is useful, it can lead people to discount relevant statistical information. In particular, people undervalue the importance of the frequency with which the un-

130 Professors Kahneman and Tversky describe the representativeness heuristic in a series of articles. *See* Amos Tversky & Daniel Kahneman, *Belief in the Law of Small Numbers*, 76 PSYCHOL. BULL. 105 (1971) (exploring the human tendency to treat a sample as more representative of a population than is justified by probability theory); Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COGNITIVE PSYCHOL. 430 (1972) [hereinafter Kahneman & Tversky, *Subjective Probability*] (first defining the "representativeness heuristic"); Daniel Kahneman & Amos Tversky, *On the Psychology of Prediction*, 80 PSYCHOL. REV. 237 (1973) [hereinafter Kahneman & Tversky, *Prediction*] (expanding upon their earlier treatment of the representativeness heuristic); Tversky & Kahneman, *supra* note 8, at 1124-28 (explaining various decision errors caused by the representativeness heuristic); Amos Tversky & Daniel Kahneman, *Judgments of and by Representativeness*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 84 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982) [hereinafter Tversky & Kahneman, *Representativeness*] (synthesizing their prior work on representativeness); Amos Tversky & Daniel Kahneman, *Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment*, 90 PSYCHOL. REV. 293 (1983) [hereinafter Tversky & Kahneman, *Conjunction Fallacy*] (exploring the "conjunction fallacy," a manifestation of the representativeness heuristic).

131 Kahneman & Tversky, *Subjective Probability*, *supra* note 130, at 431 (conceding that representativeness "is easier to assess than to characterize" because "no general definition [of it] is available"); *see also* PLOUS, *supra* note 8, at 110 (noting that this definition of representativeness is "abstract and a little hard to understand").

derlying category occurs—this is known as the "base-rate" statistic.[132] In one study, for example, researchers asked college students to indicate whether a person who "is of high intelligence, although lacking in . . . creativity[,] . . . has a [high] need for order and clarity, . . . writ[es in a] . . . dull and mechanical [fashion], . . . [and] seems to have . . . little sympathy for other people" is more likely to be a graduate student in computer science or in humanities and education.[133] Although the participants believed that there were three times as many graduate students in humanities and education than in computer science, they rated it far more likely that the person described by the researchers was a graduate student in computer science.[134] Even though this background or base-rate information is obviously highly relevant, people routinely ignore it or discount it when making categorical judgments.[135]

Psychological research does not clearly indicate why people ignore base rates and rely on the representativeness heuristic when making categorical judgments. Individuating evidence is more salient and vivid, and hence more compelling than pallid base-rate statistics.[136] Also, because relevant statistical evidence is commonly unavailable, it might simply be more efficient for people to focus on individuating evidence.[137]

What is clear, however, is that excess reliance on the representativeness heuristic leads people to commit a variety of decision-making errors.[138] In legal decision making, for example, the failure to attend

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132 Kahneman & Tversky, *Prediction, supra* note 130, at 238. The authors point out that:

> [i]n many situations, representative outcomes are indeed more likely than others. However, this is not always the case because there are factors (e.g., the prior probabilities of outcomes and the reliability of the evidence) which affect the likelihood of outcomes but not their representativeness. Because these factors are ignored, intuitive predictions violate the statistical rules of prediction in systematic and fundamental ways.

Id.

133 *Id.* at 238-39.

134 *Id.*

135 *But see* Jonathan J. Koehler, *The Base Rate Fallacy Reconsidered: Descriptive, Normative, and Methodological Challenges*, 19 BEHAV. & BRAIN SCI. 1, 1-2 (1996) (arguing that the proponents of the representativeness heuristic have overstated the extent to which people actually neglect base rates).

136 *See* RICHARD NISBETT & LEE ROSS, HUMAN INFERENCE: STRATEGIES AND SHORTCOMINGS OF SOCIAL JUDGMENT 150 (1980) (relating "the capacity of vivid, concrete data to make a greater impact on inferences than that made by data that are evidentially superior but dull and abstract in quality" to the phenomena of base-rate neglect).

137 *See generally* Gerd Gigerenzer & Daniel G. Goldstein, *Reasoning the Fast and Frugal Way: Models of Bounded Rationality*, 103 PSYCHOL. REV. 650 (1996) (discussing efficient decision-making strategies).

138 Tversky & Kahneman, *supra* note 8, at 1124-27 (explaining various decision errors caused by the representativeness heuristic). Some scholars have taken issue with the empirical work that supports the representativeness heuristic. *See, e.g.*, Leda Cosmides & John

to base rates can induce a troublesome problem known as the "inverse fallacy."[139] The inverse fallacy refers to the tendency to treat the probability of a hypothesis given the evidence (for example, the probability that a defendant was negligent given that a plaintiff was injured) as the same as, or close to, the probability of the evidence given the hypothesis (for example, the probability that the plaintiff would be injured if the defendant were negligent).[140]

Suppose, for example, that a forensic expert testifies in a criminal case that a DNA sample from the defendant matches the DNA sample found at a crime scene. Further suppose that this expert indicates that the probability that a randomly selected sample would match the sample from the crime scene is one in a million. Committing the inverse fallacy here means believing that the likelihood that the defendant is innocent is also one in a million. This inference, however, would be incorrect because the probability that the defendant is innocent also depends on the size of the population from which the suspect's DNA was drawn and the reliability of the DNA test.[141] If the defendant were randomly selected from a population of four million suspects, for example, one would expect that there are three other people who are just as likely to have committed the crime as the defendant. Mock jury research suggests that the inverse fallacy influences jurors' assessments of forensic evidence.[142]

As trained legal professionals, judges might have an advantage over other experts in these reasoning tasks. One prior study indicated that graduate training in law reduces the likelihood that a person will

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Tooby, *Are Humans Good Intuitive Statisticians After All? Rethinking Some Conclusions from the Literature on Judgment Under Uncertainty*, 58 COGNITION 1, 3-4 (1996) (arguing that people use a "frequentist" rather than a "Bayesian" approach to probability analysis); Koehler, *supra* note 135, at 3 (arguing that Tversky and Kahneman have overstated the extent to which people actually neglect base rates); Peter R. Mueser, Nelson Cowan, & Kim T. Mueser, *A Generalized Signal Detection Model to Predict Rational Variation in Base Rate Use*, 69 COGNITION 267, 268-69 (1999) (arguing that a normative model with less restrictive assumptions better explains how people make probabilistic judgments than does the representativeness account).

139 *See* Jonathan J. Koehler, *Why DNA Likelihood Ratios Should Account for Error (Even When a National Research Council Report Says They Should Not)*, 37 JURIMETRICS J. 425, 432 (1997).

140 *See, e.g., id.* ("Failure to consider the frequency of a phenomenon when predicting its chance of occurrence in a specific instance can lead to inverse fallacies in which people mistakenly conclude that the denominator of the [likelihood ratio] is identical to the denominator of the posterior odds ratio.").

141 *See id.* at 433.

142 *See* David L. Faigman & A. J. Baglioni, Jr., *Bayes' Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence*, 12 LAW & HUM. BEHAV. 1, 7-13 (1988); William C. Thompson & Edward L. Schumann, *Interpretation of Statistical Evidence in Criminal Trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy*, 11 LAW & HUM. BEHAV. 167, 174-75, 178-80 (1987).

commit the inverse fallacy.[143] Nevertheless, studies have shown that other professionals who should be adept at such tasks, such as doctors, commit the fallacy in overwhelming numbers.[144]

1. *Representativeness Heuristic: Our Materials*

To test whether judges would commit the inverse fallacy, we gave the judges in our study a res ipsa loquitur problem. In an item labeled "Evaluation of Probative Value of Evidence in a Torts Case," we presented all of the judges with a paragraph-long description of a case based loosely on the classic English case, *Byrne v. Boadle*:[145]

> The plaintiff was passing by a warehouse owned by the defendant when he was struck by a barrel, resulting in severe injuries. At the time, the barrel was in the final stages of being hoisted from the ground and loaded into the warehouse. The defendant's employees are not sure how the barrel broke loose and fell, but they agree that either the barrel was negligently secured or the rope was faulty. Government safety inspectors conducted an investigation of the warehouse and determined that in this warehouse: (1) when barrels are negligently secured, there is a 90% chance that they will break loose; (2) when barrels are safely secured, they break loose only 1% of the time; (3) workers negligently secure barrels only 1 in 1,000 times.

The materials then asked: "Given these facts, how likely is it that the barrel that hit the plaintiff fell due to the negligence of one of the workers"? The materials provided the judges with one of four probability ranges to select: 0-25%, 26-50%, 51-75%, or 76-100%.

When presented with a problem like this one, most people commit the inverse fallacy and assume the likelihood that the defendant was negligent is 90%, or at least a high percentage.[146] (Indeed, the inverse fallacy might account for a logical flaw in the doctrine of res ipsa loquitur first noted by Professor David Kaye, which we describe below.)[147] In fact, however, the actual probability that the defendant

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143 *See* Lehman et al., *supra* note 27, at 440.

144 Ward Casscells, Arno Schoenberger, & Thomas B. Graboy, *Interpretations by Physicians of Clinical Laboratory Results*, 299 NEW ENG. J. MED. 999, 999-1000 (1978).

145 159 Eng. Rep. 299 (Ex. Ch. 1863).

146 *See* David M. Eddy, *Probabilistic Reasoning in Clinical Medicine: Problems and Opportunities*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 249, 253-54 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982).

147 Professor Kaye identified the logical problems with the res ipsa loquitur doctrine more than 20 years ago. *See* David Kaye, *Probability Theory Meets Res Ipsa Loquitur*, 77 MICH. L. REV. 1456, 1458-64 (1979). The *Restatement (Second) of Torts* articulated the doctrine as follows:

> It may be inferred that harm suffered by the plaintiff is caused by negligence of the defendant when (a) the event is of a kind which ordinarily does not occur in the absence of negligence; (b) other responsible causes, including the conduct of the plaintiff and third persons, are sufficiently

was negligent is only 8.3%. To explain, we describe the conditional probabilities of the four possible outcomes, given the hypothetical facts we provided, in Table 3, below:

TABLE 3: CONDITIONAL PROBABILITIES FOR RES IPSA LOQUITUR PROBLEM

		Event		Total
		Injury	No Injury	
Actual Condition	Negligent	0.090%	0.010%	0.10%
	Not Negligent	0.999%	98.901%	99.90%
Total		1.089%	98.911%	100%

Because the defendant is negligent .1% of the time and is 90% likely to cause an injury under these circumstances, the probability that a victim would be injured by the defendant's negligence is .09% (and the probability that the defendant is negligent but causes no injury is .01%). Because the defendant is not negligent 99.9% of the time and is 1% likely to cause an injury under these circumstances, the probability that on any given occasion a victim would be injured even though the defendant took reasonable care is 0.999% (and the probability that the defendant is not negligent and causes no injury is 98.901%). As a result, the conditional probability that the defendant is negligent given that the plaintiff is injured equals .090% divided by 1.089%, or 8.3%.

2. *Representativeness Heuristic: Results*

Of the 159 judges who responded to the question,[148] 40.9% selected the right answer by choosing 0-25%; 8.8% indicated 26-50%; 10.1% indicated 51-75%; and 40.3% indicated 76-100%. Overall, the judges did well; more than 40% of them got the correct answer to a difficult question in a short period of time. Those judges who did not get the correct answer, however, exhibited a significant tendency to choose the highest range.[149] Although we did not inquire into the reasoning process that led these judges to their answers, the number of judges who chose the highest range suggests that many committed

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eliminated by the evidence; and (c) the indicated negligence is within the scope of the defendant's duty to the plaintiff.

RESTATEMENT (SECOND) OF TORTS § 328D(1) (1965). Drafts of the *Restatement (Third) of Torts* correct this error. *See infra* note 158.

148 Eight out of 167 judges, or 4.8%, did not respond.

149 $\chi^2(2) = 53.24$, $p < .001$. The statistic tests against the null hypothesis that the distribution of incorrect responses was random.

the inverse fallacy. In fact, roughly as many judges gave the right answer as gave the answer suggested by the inverse fallacy.

3. *Representativeness Heuristic: Discussion*

When presented with problems like this one, most expert decision makers over-rely on the representativeness heuristic and commit the inverse fallacy.[150] The judges in our sample, by contrast, were impressive. Roughly 40% of the judges answered this difficult evidentiary question correctly. At the same time, however, roughly 60% of the judges answered incorrectly, and two-third of those (40% of the total) selected the erroneous answer that reliance on the representativeness heuristic would suggest is correct. Thus, although the judges in our sample performed better than other previously studied groups, 40% of the judges fell into the trap that the representativeness heuristic creates.

Overreliance on the representativeness heuristic explains some important quirks in judicial behavior and legal doctrine. For example, the representativeness heuristic might account for judges' apparent preference for individuating evidence (e.g., eyewitness testimony) over statistical evidence (e.g., base rates).[151] Case law is replete with expressions of this preference. In one famous case, for example, a plaintiff who was unable to identify the defendant's bus directly tried to rely on statistical evidence that the defendant owned the bus that injured her.[152] Despite the evidentiary value of the plaintiff's base-rate evidence, the Supreme Judicial Court of Massachusetts refused to allow the plaintiff to rely solely on that evidence to prove that the defendant's bus was responsible for her injuries.[153] Although other valid policy reasons might also support this preference,[154] our study suggests that this preference may simply be the result of a cognitive illusion.

The representativeness heuristic has also led judges to create erroneous legal doctrine. As Professor Kaye has noted, the doctrine of res ipsa loquitur (upon which the problem in our questionnaire is based) historically includes a radical misunderstanding of probability

150 *See* Eddy, *supra* note 146, at 253-54.

151 Amos Tversky & Daniel Kahneman, *Evidential Impact of Base Rates, in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 153, 156-58 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982).

152 Smith v. Rapid Transit, Inc., 58 N.E.2d 754, 755 (Mass. 1945).

153 *Id.*

154 *See* Charles Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357, 1368-77 (1985); Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1344-50 (1971). *But see* Jonathan J. Koehler & Daniel N. Shaviro, *Veridical Verdicts: Increasing Verdict Accuracy Through the Use of Overtly Probabilistic Evidence and Methods*, 75 CORNELL L. REV. 247, 274-75 (1990) (arguing for greater reliance on statistical evidence in the courts).

theory.[155] According to the *Restatement (Second) of Torts*, a jury can infer that the defendant is negligent from the occurrence of an event that is "of a kind which ordinarily does not occur in the absence of negligence."[156] This inference owes its superficial appeal to the representativeness heuristic.[157] Even if an event does not ordinarily occur when negligence is absent, the event still may be more likely to be the product of non-negligence than negligence. In the problem that we used in this study, for example, the accident was unlikely to occur when the defendant was not negligent. Nevertheless, because negligence was rare, the event was still unlikely to have been caused by negligence. Although the most recent version of the *Restatement (Third) of Products Liability* and drafts of the *Restatement (Third) of Torts* both remedy this logical error,[158] it has lingered in the courts for over a century. We submit that the error owes its existence to the failure to attend to base-rate statistics.

E. Egocentric Biases

People tend to make judgments about themselves and their abilities that are "egocentric" or "self-serving."[159] People routinely estimate, for example, that they are above average on a variety of desirable characteristics, including health,[160] driving,[161] professional

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155 Kaye, *supra* note 147, at 1457.

156 RESTATEMENT (SECOND) OF TORTS § 328D(1)(a) (1965).

157 *See* Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?*, 79 OR. L. REV. 61, 82-85 (2000).

158 The *Restatement (Third) of Torts: Products Liability* includes the following language to describe the doctrine of res ipsa loquitur:

> It may be inferred that the harm sustained by the plaintiff was caused by a product defect existing at the time of sale or distribution, without proof of a specific defect, when the incident that harmed the plaintiff:
>
> (a) was of a kind that ordinarily occurs as a result of product defect; and
>
> (b) was not, in the particular case, solely the result of causes other than product defect existing at the time of sale or distribution.

RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 3 (1998). The proposed *Restatement (Third) of Torts: General Principles*, adopts the following language for res ipsa loquitur: "It may be inferred that the defendant has been negligent when the accident causing the plaintiff's physical harm is a type of accident that ordinarily happens because of the negligence of the class of actors of which the defendant is the relevant member." RESTATEMENT (THIRD) OF TORTS: GENERAL PRINCIPLES § 15 (Discussion Draft, 1999).

159 *See, e.g.*, Michael Ross & Fiore Sicoly, *Egocentric Biases in Availability and Attribution*, 37 J. PERSONALITY & SOC. PSYCHOL. 322 (1979) (testing for egocentric biases in joint activities).

160 *See* Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCHOL. 806, 809-11 (1980).

161 *See* Ola Svenson, *Are We All Less Risky and More Skillful Than Our Fellow Drivers?* 47 ACTA PSYCHOLOGICA 143, 145-46 (1981).

skills,[162] and likelihood of having a successful marriage.[163] Moreover, people overestimate their contribution to joint activities. For example, after a conversation both parties will estimate that they spoke more than half the time.[164] Similarly, when married couples are asked to estimate the percentage of household tasks they perform, their estimates typically add up to more than 100%.[165]

Egocentric biases occur for several reasons. First, of course, is self-presentation.[166] People may not really believe that they are better than average, but they will nonetheless tell researchers that they are.[167] Second, people engage in confirmatory mental searches for evidence that supports a theory they want to believe, such as that their marriage will succeed.[168] They have no comparable data on the nature of strangers' marriages, so the only evidence they find suggests that theirs is more likely than others' to be successful.[169] Third, memory is egocentric in that people remember their own actions better than others' actions.[170] Thus, when asked to recall the percentage of housework they perform, people remember their own contribution more easily and, consequently tend to overestimate it.[171] Finally, many of the constructs involved in egocentric biases are ambiguous, and thus, people can define success differently.[172] For example, safe driving means different things to different people, and as a result, everyone really can drive safer than average, at least as measured by their own standards.[173]

Egocentric biases can be adaptive, but they can also have an unfortunate influence on the litigation process.[174] Due to egocentric biases, litigants and their lawyers might overestimate their own abilities,

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162 *See* K. Patricia Cross, *Not* Can, *But* Will *College Teaching Be Improved?*, NEW DIRECTIONS FOR HIGHER EDUC., Spring 1997, at 1, 9-10.

163 *See* Lynn A. Baker & Robert E. Emery, *When Every Relationship Is Above Average: Perceptions and Expectations of Divorce at the Time of Marriage*, 17 LAW & HUM. BEHAV. 439, 441-43 (1993) (finding that recently married couples almost unanimously expect that they will not get divorced, despite knowing that the divorce rate is fifty percent).

164 *See* Ross & Sicoly, *supra* note 159, at 324.

165 *Id.* at 325-26.

166 *See* SUSAN T. FISKE & SHELLEY E. TAYLOR, SOCIAL COGNITION 78-82 (1991) (describing theories that account for egocentric biases).

167 *See id.*

168 *See id.*

169 *See* Baker & Emery, *supra* note 163, at 446-48.

170 *See* FISKE & TAYLOR, *supra* note 166, at 78-82.

171 *See* Ross & Sicoly, *supra* note 159, at 324.

172 George Loewenstein, Samuel Issacharoff, Colin Camerer, & Linda Babcock, *Self-Serving Assessments of Fairness and Pretrial Bargaining*, 22 J. LEGAL STUD. 135, 141 (1993) (discussing the origins of egocentric biases).

173 *See* Svenson, *supra* note 161, at 145-46.

174 *See, e.g.*, Linda Babcock & George Loewenstein, *Explaining Bargaining Impasse: The Role of Self-Serving Biases*, J. ECON. PERSP., Winter 1997, at 109, 110-11; Babcock & Pogarsky, *supra* note 64, at 352-54; Loewenstein et al., *supra* note 172, at 140-55.

the quality of their advocacy, and the relative merits of their cases.[175] These views, in turn, are likely to undermine settlement efforts. In one study, for example, Professor George Loewenstein and his colleagues asked undergraduates and law students to assess the value of a tort case in which the plaintiff had sued the defendant for $100,000 in damages arising from an automobile-motorcycle collision.[176] These researchers assigned some participants to play the role of plaintiff and others the role of defendant, but they provided both sets of participants with *identical* information about the case.[177] Nevertheless, the participants interpreted the facts in self-serving ways. When asked to predict the amount they thought the judge would award in the case, the participants evaluating the case from the perspective of the plaintiff predicted that the judge would award $14,527 more than the defendant-participants predicted.[178] When asked to identify what they perceived to be a fair settlement value, plaintiff-participants selected a value $17,709 higher than the value selected by defendant-participants.[179] These results suggest that self-serving or egocentric biases can lead to bargaining impasse and wasteful litigation.

Like litigants and lawyers, judges might also be inclined to interpret information in self-serving or egocentric ways. Egocentric biases could lead judges to believe that they are better decision makers than is really the case.

1. *Egocentric Biases: Our Materials*

To test whether judges are prone to egocentric biases, we asked the judges participating in our study to respond to a simple question. In an item labeled "Appeal Rates," we asked the judges to estimate their reversal rates on appeal: "United States magistrate judges are rarely overturned on appeal, but it does occur. If we were to rank all of the magistrate judges currently in this room according to the rate at which their decisions have been overturned during their careers, [what] would your rate be"? We then asked the judges to place themselves into the quartile corresponding to their respective reversal rates: highest (i.e., >75%), second-highest (>50%), third-highest

175 *See, e.g.*, Babcock & Loewenstein, *supra* note 174, at 119 (noting that egocentric biases are likely to be "an important determinant of bargaining impasse"); Babcock & Pogarsky, *supra* note 64, at 352-53 (noting that there is "abundant empirical evidence that individuals consistently exhibit 'self-serving biases' during negotiations").

176 Loewenstein et al., *supra* note 172, at 145.

177 *Id.*

178 *Id.* at 150.

179 *Id.*

(>25%), or lowest (<25%). The materials explained the meaning of each quartile in careful detail.[180]

2. *Egocentric Biases: Results*

In their responses to the questionnaire, the judges exhibited an egocentric bias. Of the 155 judges who responded to this question,[181] 56.1% reported that their appeal rate placed them in the lowest quartile; 31.6% placed themselves in the second-lowest quartile; 7.7% in the second-highest quartile, and 4.5% in the highest quartile. In other words, 87.7% of the judges believed that at least half of their peers had higher reversal rates on appeal. This pattern of results differs significantly from what one would expect if judges were unbiased.[182]

It is possible that the 56.1% of the judges who placed themselves in the lowest quartile have never been overturned on appeal, which suggests that they really do belong in the lowest quartile. In fact, several judges indicated that they had never been reversed. If so, however, the 31.6% of judges who placed themselves in the next lowest quartile were wrong, and in any event, it is impossible for only 4.5% of the judges to be in the highest quartile. Even if the 56.1% of the judges in the lowest quartile had never been overturned on appeal, and hence were being as accurate as possible, the remaining 43.9% of the judges exhibited a significant egocentric bias.[183]

3. *Egocentric Biases: Discussion*

The judges in our study exhibited a strong egocentric bias concerning the likelihood that they would be overturned on appeal. The results do not, however, reveal whether the judges truly believed their egocentric answers or were simply unwilling to admit that they had high reversal rates. Given that the judges knew that their responses were anonymous, they had little reason to hide their true beliefs. Furthermore, the results of similar studies of egocentric biases indicate that although self-presentation effects explain some of the results, most people genuinely believe that they are better than average at a variety of endeavors.[184] Also, our results are similar to those found in

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180 For example, next to the line marked "[i]n the highest quartile," we include the following explanation: "(meaning the rate at which you have been overturned is higher than that of 75% of the magistrate judges in this room)."

181 Twelve judges out of 167 (7.2%) declined to respond to this question.

182 $\chi^2(3) = 107.3$, $p < .001$. The statistic tests the null hypothesis that 25% of the responses would fall into each of the four quartiles (which would be normatively correct).

183 $\chi^2(2) = 46.4$, $p < .001$. The statistic tests the null hypothesis that the responses would fall equally into each of the three quartiles other than the highest (which would be normatively correct).

184 *See* Babcock & Loewenstein, *supra* note 174, at 110-11.

a study of bankruptcy judges conducted by Professor Theodore Eisenberg.[185] Eisenberg's study showed that bankruptcy judges expressed substantially different beliefs than the attorneys who appeared before them, even as to seemingly objective matters, such as whether judges grant interim fee applications.[186] Also, the bankruptcy judges in Eisenberg's study overestimated the degree to which the lawyers who appear in front of them feel fairly treated.[187]

Egocentric biases might prevent judges from maintaining an awareness of their limitations; in turn, this might work to the detriment of litigants appearing in their courtrooms. For example, a federal district judge can grant an interlocutory appeal only if she is willing to concede that she has issued a ruling on a matter of law "as to which there is substantial ground for difference of opinion."[188] Thus, a litigant seeking to persuade a judge to grant an interlocutory appeal must convince her that another judge could easily disagree with her ruling. Similarly, prisoners seeking an appeal from a federal district court's denial of a petition for writ of habeas corpus must first seek a certificate of appealability from the same court that rejected the claim.[189] Obtaining the certificate of appealability requires that the prisoner demonstrate to a judge that he or she denied a claim in a way that "reasonable jurists would find . . . debatable or wrong."[190] The influence of the egocentric bias likely makes it difficult for litigants to convince federal judges that they might have been wrong.

Finally, egocentric biases might make it unlikely that judges will grant requests to set aside judgments in both civil and criminal cases.[191] Even in a jury trial, egocentric biases might lead the judge to react too skeptically to the suggestion that the trial over which he presided produced an erroneous result. More generally, egocentric biases may make it hard for judges to recognize that they can and do make mistakes.

At the same time, egocentric biases can be beneficial. Psychologists argue that having a somewhat inflated belief in one's abilities helps maintain one's morale and ensures a healthy sense of well-being.[192] Also, society surely prefers its judges to be resolute and self-assured rather than timid and insecure. Egocentric beliefs may in-

185 Eisenberg, *supra* note 21, at 983-87.
186 *Id.* at 983 tbl.1.
187 *Id.* at 986 tbl.2.
188 28 U.S.C. § 1292(b) (1994).
189 28 U.S.C. § 2253(c) (Supp. IV 1998).
190 Slack v. McDaniel, 529 U.S. 473, 484 (2000).
191 In civil cases, such requests can be made under FED. R. CIV. P. 59 and FED. R. CIV. P. 60. In criminal cases, collateral attacks on the verdict can be brought under 28 U.S.C. § 2255 (Supp. IV 1998).
192 *See* Shelley E. Taylor & Jonathan D. Brown, *Illusion and Well-Being: A Social Psychological Perspective on Mental Health*, 103 PSYCHOL. BULL. 193, 199-200 (1988).

duce judges to see the world in a self-serving fashion, but the justice system may ultimately be better off because of it.

F. Cognitive Illusions in Judges and Other Decision Makers

Our study indicates that judicial decision making, like the decision making of other experts and laypeople, is influenced by the cognitive illusions we tested. But do these cognitive illusions influence judges as much as they influence other decision makers? It is difficult to answer this question accurately, because different studies use different materials and methodologies. Nevertheless, in Table 4, below, we compare our results to the results of studies of other decision makers.[193]

Table 4 shows that the judges in our study appear to be just as susceptible as other decision makers to three of the cognitive illusions we tested: anchoring, hindsight bias, and egocentric bias. Though still susceptible to framing and the representativeness heuristic, the judges appear less susceptible than other decision makers to these effects. We consider each below.

Judges in our study proved susceptible to anchoring effects, as have laypersons in mock-jury studies. Direct comparisons between the size of the effect of the anchor are difficult because our materials differed substantially from those used in the mock-jury studies. In particular, most mock-jury studies have used anchors that are higher than the expected awards in the absence of an anchor, while we used an anchor that was lower than the expected awards in the absence of an anchor. Also, the source of the anchor in most mock-jury studies is a damage request from the plaintiff's lawyer, while we used the jurisdictional limit for diversity suits in federal court. The only study to compare a low anchor with a condition without any anchor found that the anchor reduced mean awards from $167,812 to $90,333.[194] Although the percentage reduction in mean awards in that study of mock jurors exceeded the one we found in our study of judges (46% versus 29%), we found a greater mean reduction in absolute dollars (roughly $77,000 versus $368,000).

In comparable studies of framing effects, researchers have found much larger differences in settlement rates between subjects in the gains-frame condition and subjects in the losses-frame condition. The judges in our study were fifteen percentage points more inclined to say that plaintiff rather than defendant should settle, while other studies using student subjects have found fourteen to fifty-one percentage-

193 In constructing the comparisons in Table 4, we contrasted our results with those of studies that used materials that were the most comparable to the questions that we used in our study.

194 Malouff & Schutte, *supra* note 15, at 494-95 tbl.1.

TABLE 4: JUDGES AS COMPARED TO OTHER DECISION MAKERS

Cognitive Illusion				*Compared to Others*
	Our Test for the Illusion	*Normative Expectation (Without the Influence of the Cognitive Illusion)*	*Size of the Observed Effect in Our Study*	
Anchoring Effects	Estimated damages with and without a low anchor	No difference between conditions	Anchor reduced awards by 29%	Comparable
Framing Effects	Settlement rates in gains and losses frames	No difference between conditions	Settlement rate 15 percentage points higher in gains frame	Better
Hindsight Bias	Percent identifying known outcome as most likely outcome	Total percentage of judges identifying known outcome (across 3 conditions) sums to 100%	Percentage identifying known outcome summed to 172%	Comparable
Representativeness Heuristic	Solution to evidentiary problem	All choose the correct answer	41% chose correct answer	Better
Egocentric Bias	Identifying relative rate of being overturned on appeal (in quartiles)	Uniform distribution of answers across four quartiles	56% chose lowest quartile; 88% report being better than the median judge	Comparable

point differences between subjects in the two conditions.[195] In the prior study most similar to ours, Jeffrey Rachlinski gave law student subjects a hypothetical copyright scenario and found a forty-six percentage-point difference in settlement rates between plaintiff and defendant subjects,[196] a much larger effect than we observed in our study. Although the stakes in Rachlinski's study were higher ($400,000 as opposed to $200,000) and the overall settlement rate differed (54% in Rachlinski's study versus 68% in our study), the difference between the results of the two studies suggests that judges are less susceptible to framing effects. This conclusion is consistent with

195 *See* Korobkin & Guthrie, *supra* note 86, at 130-38; Rachlinski, *supra* note 81, at 135-44.

196 Rachlinski, *supra* note 81, at 144.

previous studies indicating that experienced lawyers are less susceptible to the influence of framing.[197]

The judges in our study exhibited hindsight bias to the same extent as mock jurors and other laypersons. Our study differs from most studies of the hindsight bias because we asked the judges to choose among three options rather than to assign specific probability estimates. In a statistical review of studies of the hindsight bias in circumstances similar to legal judgments, researchers found that the hindsight bias alters the decisions of 27% of the subjects.[198] This approximates our finding that 24% of the judges in our study made a different choice because of the hindsight bias.[199] Our result is also within the range of shifts observed in previous mock-jury studies of the hindsight bias.[200] Finally, the hindsight bias is one of two illusions we tested that previous researchers have tested on judges, and our results are consistent with the findings of this prior research.[201]

The judges in our study were much more attentive than other experts to base-rate statistics and were much less likely to make decisions based solely on the representativeness of the evidence. Our materials differed somewhat from previous studies in that we asked the judges to select one of four answers rather than to provide a specific probability estimate. Nevertheless, in a comparable study, only 18% of doctors—as compared to 40% of the judges in our study—provided the correct answer to a problem like ours.[202]

Finally, the judges in our study exhibited egocentric biases comparable to those exhibited by subjects in other similar studies.[203] In our study, 87.7% of the judges rated themselves as less likely to be overturned than the average judge. Judges in our sample were only slightly more modest than university faculty—94% of whom rated themselves as better than average teachers.[204]

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197 Korobkin & Guthrie, *supra* note 27, at 100-01 (finding that lawyer subjects did not seem to be as affected by framing as laypersons).

198 Christensen-Szalanski & Willham, *supra* note 117, at 161 tbl.3.

199 172% minus 100% divided by 3 conditions.

200 Three mock-jury studies used binary decisions: Hastie et al., *supra* note 13, at 606 (24% shift); Kamin & Rachlinski, *supra* note 13, at 98 (34% shift); Stallard & Worthington, *supra* note 13, at 679 (28% shift).

201 *See* Anderson et al., *supra* note 21, at 725-30; Hastie & Viscusi, *supra* note 21, at 906; Viscusi, *supra* note 21, at 46-55; Jennings et al., *supra* note 21. The studies conducted by Professors Viscusi and Hastie found that judges were somewhat less susceptible to the hindsight bias, *see* Hastie & Viscusi, *supra* note 21, at 906; Viscusi, *supra* note 21, at 29, but we suspect that the sample of judges in these studies (those who chose to attend a conference on law and economics) and the context within which the study took place (a law and economics conference) may have induced somewhat more calculated reasoning processes that dampened the effect.

202 Casscells et al., *supra* note 144, at 1000.

203 Svenson, *supra* note 161, at 145-46.

204 Cross, *supra* note 162, at 10.

G. Do These Findings Apply to Judges in the Courtroom?

Our study shows that judges rely on cognitive processes that are likely to induce them to make systematic errors, but it does not conclusively demonstrate that judges actually make such errors in the courtroom. The decisions that judges made in response to our materials differ from the decisions that they make in their courtrooms in several important ways. In the courtroom, judges must make decisions based on more detailed and complicated records, are more highly motivated to make accurate judgments, and have more time and resources to devote to the decision. Many cases also doubtless turn on issues less subject to the effects of cognitive illusions. Others are so straightforward that cognitive illusions should not influence the outcome. These differences suggest that we should be cautious in interpreting our results.

Nevertheless, it is likely that the results of our study have some application to decisions made outside the laboratory. In our study, we employed standard cognitive psychological research methods, which have proven enormously successful in identifying decision-making strategies that people use in making real decisions.[205] The basic methodology of cognitive psychologists—whether they study memory, visual perception, or judgment—is to tax people's cognitive abilities, to determine their successes and failures, and then to infer how people think based on their responses under these conditions.[206] These methods frequently demonstrate that people make predictable errors, thereby revealing their thought processes.

To the extent that the methods used in this study have identified thought processes that judges use, the conclusions apply in the courtroom. After all, increased motivation and incentives "do not operate by magic: they work by focusing attention and by prolonging deliberation."[207] Only if increased attention and greater deliberation enable judges to abandon the heuristics that they are otherwise inclined to rely upon can they avoid the illusions of judgment that these heuristics produce. This does not seem likely. "The corrective power of in-

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205 *See, e.g.*, Daniel Kahneman & Amos Tversky, *On the Reality of Cognitive Illusions*, 103 PSYCHOL. REV. 582, 582 (1996). Some scholars have criticized these methods, however. *See, e.g.*, Cosmides & Tooby, *supra* note 138, at 11-14 (arguing that cognitive psychology is inconsistent with principles of behavior derived from evolution); Gerd Gigerenzer, *How to Make Cognitive Illusions Disappear: Beyond "Heuristics and Biases"*, 2 EUR. REV. SOC. PSYCHOL. 83 (1991) (arguing that cognitive psychologists overstate the applicability of their findings to real world decisions).

206 *See* Kahneman & Tversky, *supra* note 205, at 582 (explaining methods of cognitive psychologists).

207 Tversky & Kahneman, *Rational Choice*, *supra* note 76, at S274.

centives depends on the nature of the particular error and cannot be taken for granted."[208]

Similarly, the greater detail that judges face in actual cases does not by itself reduce the effects of cognitive illusions. The materials used in our study, and in most cognitive psychological research on human judgment, are intentionally simple. They are designed to isolate a particular pattern of thought. Factors other than any single cognitive illusion can influence the decision made in a more complicated case, but there is no guarantee that these other influences will swamp the illusion so dramatically that the illusion's influence will be negligible. In fact, details actually feed into some cognitive illusions, including the hindsight bias, and these illusions grow *more* powerful as the materials upon which they are based become more detailed.[209]

Greater resources also provide no guaranteed protection against the influence of cognitive illusions. Judges obviously can use the resources they have to obtain better research and background information to inform their decisions, but their time and resources are not infinite. Even with greater resources, judges will still resort to cognitive shortcuts. If judges are unaware of the cognitive illusions that reliance on heuristics produces, then extra time and resources will be of no help. Judges will believe that their decisions are sound and choose not to spend the extra time and effort needed to make a judgment that is not influenced by cognitive illusions.

Perhaps the best support for the conclusion that susceptibility to cognitive illusions will persist in the face of high motivation and great detail are the results of those studies showing that cognitive illusions adversely affect the quality of decisions made in the real world. In one striking example, researchers demonstrated that framing effects persist among poor people even when the stakes consist of two-months' salary.[210] Furthermore, several studies show that framing effects and egocentric biases influence decisions when the stakes are high; for example, framing effects and egocentric biases influence lawyers' assessments of actual lawsuits.[211] Similarly, numerous case studies reveal the influence of the hindsight bias on expert evaluations of the causes of accidents.[212]

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208 *Id.*

209 *See* Rachlinski, *supra* note 104, at 576.

210 Steven J. Kachelmeier & Mohamed Shehata, *Examining Risk Preferences Under High Monetary Incentives: Experimental Evidence from the People's Republic of China*, 82 AM. ECON. REV. 1120, 1123-24 (1992).

211 Rachlinski, *supra* note 81, at 154 & tbl.2 (demonstrating that framing effects influence actual settlement negotiations); Marijke Malsch, Lawyers' Predictions of Judicial Decisions: A Study on Calibration of Experts (1989) (unpublished Ph.D. dissertation, Vrije Universiteit, Amsterdam) (on file with authors) (finding that lawyers in actual cases are overconfident of their ability to predict judges' decisions).

212 Fischhoff, *supra* note 100.

Most importantly, published judicial opinions include examples of the influence of cognitive illusions. As noted above, the judge-made res ipsa loquitur doctrine appears to be a product of overreliance on the representativeness heuristic. The judges in cases such as *Byrne v. Boadle* surely were motivated to reach the right answer and probably had the benefit of a detailed record. Nevertheless, these judges, along with generations of other judges in a multitude of other cases involving res ipsa loquitur (as well as the American Law Institute in its *Restatement of the Law of Torts*) cemented this error into the common law for over a century. Similarly, judges applying the prudent-investor rule to cases of trustee liability seem also to have fallen prey to the hindsight bias.[213] These examples suggest that the motivation, detail, and resources that judges have available in deciding cases do not necessarily enable them to avoid the effects of cognitive illusions.

In our study, we included items designed to identify patterns of choices that would reveal whether judges rely on thought processes that create cognitive illusions. The judges' answers to our questions were not the random "noise" that one might expect if judges were not attending carefully to the questions. Rather, the answers confirmed predictions derived from psychological research on judgment and decision making. In the course of making decisions in the courtroom, judges certainly face more complex fact patterns, have more motivation to make good decisions, have more time to make decisions, and receive assistance from litigants, lawyers, and clerks. But unless these factors alter the fundamental ways judges think, they will not eliminate the effects of cognitive illusions.

III
GENERAL DISCUSSION AND IMPLICATIONS

Judges, it seems, are human.[214] Like the rest of us, they use heuristics that can produce systematic errors in judgment. Unlike the rest of us, however, judges' judgments can compromise the quality of justice that the courts deliver. What can the legal system do to avoid or minimize the effects of cognitive illusions? There is no single, simple answer to this question. We discuss three potential remedies below. First, judges might learn to educate themselves about cognitive illusions so that they can try to avoid the errors that these illusions tend to produce. Second, the legal system might consider reallocating decision-making power between judges and juries as a means of reducing the effects of cognitive illusions. Third, judges and legisla-

213 *See supra* notes 126-29 and accompanying text.

214 *See* Jerome Frank, *Are Judges Human?*, 80 U. PA. L. REV. 17, 233 (1931).

tors might craft legal rules that minimize the adverse effects that cognitive illusions can have on judgment.

A. Improving Judges' Judgment

The heuristics that create cognitive illusions are deeply ingrained and are often useful decision aids, so it would be difficult for judges to refrain from using them. Nevertheless, judges can (and, we argue, often do) make good decisions by learning to adopt multiple perspectives on the problems confronting them, restricting their use of heuristics to normatively appropriate circumstances, and distrusting inclinations that are likely to be the product of cognitive illusions.

1. *Adopting Multiple Perspectives*

Judges may be able to reduce the effect of some cognitive illusions by approaching decisions from multiple perspectives. For example, the undesirable consequences of framing, which generally consist of making choices that are too risky when faced only with potential losses, can be overcome by recognizing that decisions can often be characterized either as gains or as losses.[215] In the copyright dispute we described above, for example, the defendant appeared to face a choice between a 50% chance of losing $200,000 at trial (plus $50,000 in attorneys' fees) and a certain $140,000 loss (in the form of a settlement). The choice of whether to pay the $140,000 settlement, however, could be re-characterized as a $10,000 gain over the expected loss of $150,000.[216] Alternatively, the defendant could recognize that it would still realize $60,000 in revenue on its alleged use of the copyright-protected materials if it accepted the settlement. Considering a decision from different perspectives does not necessarily eliminate the effects of decision frames, but it can reveal to the decision maker the arbitrary nature of a frame's influence.

In their roles as case managers or settlement brokers, judges are in a unique position to re-frame settlement decisions for the parties because they have no stake in the outcome. Indeed, one possible reason that framing effects influenced the settlement preferences of the judges in our study to a lesser extent than other populations might be that judges learn to consider a case from multiple frames. Because

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215 *See* Kahneman & Tversky, *Choices, Values, and Frames*, *supra* note 76, at 343-44; Kahneman & Tversky, *Prospect Theory*, *supra* note 76, at 268-69; Tversky & Kahneman, *Framing of Decisions*, *supra* note 76, at 456; Tversky & Kahneman, *Rational Choice*, *supra* note 76, at S257-58. A decision maker could also pursue a simple economic cost-benefit assessment of the decision as a way of substituting a different, perhaps superior, cognitive process.

216 Popular books on negotiation suggest precisely this strategy. *See, e.g.*, ROGER FISHER & WILLIAM URY, GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN 97-106 (2d ed. 1991) (advising people to always consider their best alternative to a negotiated settlement before entering into negotiations).

judges will generally hear both sides of a dispute before (and during) the time they act as mediators, the judges will have access to each side's perspective. This makes it easier for the judge to see the case through each potential frame.

Judges can, and should, make a conscious effort to re-frame decisions that seem like losses because parties facing losses often undertake undesirably risky (and costly) litigation strategies, such as rejecting risk-neutral settlement offers.[217] As they gain experience with settlement negotiations, many judges likely learn that recharacterizing decision options can convince a litigant to abandon an economically wasteful preference for trial. Judges should be taught these techniques during their orientation or as part of other training programs.

2. *Limiting Heuristics to Normatively Appropriate Circumstances*

Judges can also try to limit the use of heuristics to normatively appropriate circumstances. For example, many anchors convey useful information, so anchoring often improves the quality of a decision. Meaningless anchors, however, lead people astray. As experienced decision makers with some control over the information presented to them, judges can limit their exposure to certain anchors. Judges should be wary of simply relying on anchors supplied by litigants, such as a plaintiff's lawyer's damage request, or other anchors unconnected to the true value of the case, such as a statutory damage cap. Instead, judges should use more reliable numerical reference points, such as a composite of damage awards in similar cases.

In our study, for example, judges who declined to provide a damage estimate in response to the anchoring question frequently expressed their frustration at the lack of reliable numerical anchors in the problem. Several judges asserted that they could not answer without knowing the plaintiff's age and annual salary. In effect, these judges were searching for a reliable anchor. In our study, we deliberately withheld any additional numbers that could be used as anchors, so as to isolate the effect of the one anchor that we did provide. In an actual case, several useful anchors (as well as other information) are available to the judge.

Similarly, although the representativeness heuristic is frequently a useful guide to evaluating evidence, it can lead people astray when relevant background statistics are available. For example, judges should regard a litigant's efforts to prove that a highly unlikely event occurred with great suspicion. A rare event (such as the accident in

217 *See* Rachlinski, *supra* note 81, at 154-60 (arguing that the risk-seeking tendencies that the loss frame produces encourages defendants to undertake risky litigation strategies).

our res ipsa loquitur problem) is more likely to be the extraordinary product of a common cause (non-negligence) than the ordinary product of an extraordinary cause (negligence). Rare events should not be attributed to extraordinary causes without powerful evidence.[218]

The fact that the judges in our study performed better than other experts on the res ipsa loquitur problem suggests that judicial experience might curb undue reliance on the representativeness heuristic. Although scholars frequently criticize judges for failing to evaluate statistical evidence properly,[219] judges have a wealth of experience evaluating the probative value of evidence. This experience may have led the judges in our study to distrust their inclination to rely on the similarity between the evidence and the hypothesis it allegedly supports. We doubt, for example, that judges are as swayed by potentially misleading evidence, such as the apparent nervousness of a criminal defendant, as juries, because judges have encountered countless nervous defendants in their courtroom. Just as experience teaches judges how to evaluate evidence appropriately, this skill can also be taught to new judges.

3. *Reducing Reliance on Tainted Judgments*

Finally, judges can avoid relying on judgments that are especially prone to distortion by cognitive illusions. Among the five illusions we tested, the egocentric bias and the hindsight bias are essentially impossible to avoid. Egocentric beliefs are closely connected to good mental health, especially in instances where those abilities are important to one's personal or professional life.[220] Inflated beliefs in one's personal and professional abilities allow people to enjoy a high sense of self-esteem; in fact, only people who are depressed appear to possess an accurate portrait of their abilities.[221] Not only would it be difficult for judges to learn to avoid egocentric biases, it might be inadvisable for them to try. On balance, the social benefits of having confident, decisive judges likely outweigh the costs associated with an occasional erroneous decision caused by such self-assurance.

Nevertheless, judges should temper their confidence in their abilities. In circumstances that require judges to determine how sure they are of their decisions (such as whether to certify an issue for interlocutory appeal or to issue a certificate of appealability in a prisoners'

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218 *See* Thomas D. Lyon & Jonathan J. Koehler, *The Relevance Ratio: Evaluating the Probative Value of Expert Testimony in Child Sexual Abuse Cases*, 82 CORNELL L. REV. 43, 46-47 (1996).

219 *Id.* at 45.

220 *See* SHELLEY E. TAYLOR, POSITIVE ILLUSIONS: CREATIVE SELF-DECEPTION AND THE HEALTHY MIND 59-65 (1989).

221 *Id.* at 214 ("[M]ildly depressed people actually have a somewhat more accurate view of reality, at least about certain things, than do people who are not depressed.").

rights case), judges should proceed with caution and search for independent sources of judgment, if possible.[222] For example, local rules could be adjusted to encourage or require judges to assign a request for a certificate of appealability to a different judge, even though this would be much less efficient than allowing the same judge who made the underlying decision to rule on it.

The hindsight bias poses the most troublesome problem for judges. Learning the outcome has such profound and subtle effects on people's beliefs that re-creating a past prediction is like trying to cross the same river twice—upon learning the outcome the brain has developed a new set of beliefs and can never really return to its previous state. Unfortunately, understanding the hindsight bias does nothing to reduce its influence;[223] neither does instructing subjects to be careful to avoid its effects.[224] The judges in our study revealed a strong hindsight bias. Previous research suggests that correcting for the bias is not feasible.[225]

When confronted with judgments likely to be affected by the hindsight bias, judges should distrust their intuitive assessments of what parties could have predicted. Instead, they should rely on ex ante standards of conduct, if available. For example, a defendant's nonconformity or conformity with a regulatory safety standard might be better evidence of the defendant's negligence or non-negligence than an intuitive sense of whether a defendant seemed to have behaved reasonably or not. Legal reforms that would promote judgments based on ex ante standards should also be considered and are discussed below.

4. *A Note on Judicial Specialization*

In addition to the general strategies described above, judicial decision making might also benefit from specialization on the bench. Suppose, for example, that some judges functioned solely as adjudicators, while others functioned solely as case managers. The full-time trial judges should develop a better sense of when the representativeness heuristic leads them astray than judges who conduct trials only part of the time. Similarly, the full-time managerial judges should become more adept at helping litigants to avoid framing effects than judges who occasionally supervise settlement conferences. Greater ex-

222 Ethical rules limiting ex parte judicial contacts generally forbid judges from pursuing the most obvious means of assessing the certainty of one's judgment—seeking an outside opinion. *See* CHARLES W. WOLFRAM, MODERN LEGAL ETHICS § 11.3.3 (1986).

223 Rachlinski, *supra* note 104, at 586-88 (reviewing studies on ways to reduce the influence of the hindsight bias).

224 *Id.* at 586.

225 *Id.*

perience, training, and specialization should enable judges to make better decisions.

B. Juries Versus Judges

Reformers commonly propose that the legal system should rely more heavily on judges than juries as a means of reducing the influence of cognitive errors in the courtroom.[226] Recent years, in fact, have witnessed increasing distrust of juries and numerous efforts to curb their authority.[227] Although previous research has shown that cognitive illusions influence juries,[228] the results of our study suggest that choosing the optimal decision maker requires a comparison of the relative strengths and weaknesses of judges and juries.[229]

Even though the results of our study demonstrate that relying on judges would not cure all of the problems that cognitive illusions create for the justice system, our study provides insight into when judges are more likely than juries to make unbiased decisions (and vice versa). Judges are likely to be better decision makers in circumstances where decision-making experience can blunt the effects of cognitive illusions. For example, even though our results suggest that judges rely on anchors as much as juries do, judges might avoid some of the unwanted effects of anchoring if they are aware of awards in comparable cases and can use this information as a source of anchors. Although anchors from similar cases might be somewhat inaccurate, at least they are not provided by litigants. In contrast to judges, jurors are less likely to have comparable information at their disposal and may be more susceptible to partisan anchors, such as damage requests made by plaintiffs' attorneys.

Judges are also in a better position to determine whether evidence is relevant. Relevance is largely a statistical concept that is easily misunderstood. Judges are less likely than jurors to rely on heuristics like representativeness that can lead to erroneous evidentiary determinations. Suppose, for instance, that a prosecutor wanted to introduce testimony that carpet fibers from a criminal defendant's home matched carpet fibers found at a crime scene. Further suppose that the forensic test used to make the match also finds that the carpet fiber found at the crime scene is extremely common and would match

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226 *See, e.g.*, Posner, *supra* note 115, at 1501; Sunstein et al., *supra* note 16, at 2127; Viscusi, *supra* note 21, at 60.

227 Mark Curriden, *Putting the Squeeze on Juries*, A.B.A. J., Aug. 2000, at 52, 53.

228 *See supra* notes 12-16 and accompanying text.

229 Professors Kalven and Zeisel noted decades ago in their well-known empirical study that judges and juries usually agree on trial verdicts, but they diverge in other, predictable circumstances. *See* HARRY KALVEN, JR. & HANS ZEISEL, THE AMERICAN JURY 104-17 (1966). Kalven and Zeisel found that disparate assessments of evidence produced most of the judge-jury disagreements. *Id.* at 115.

carpet fibers in 90% of the homes in the United States. The testimony that the fibers match is of almost no relevance to the defendant's guilt. Experienced judges are unlikely to admit such evidence or to give it much weight. Jurors encountering this information for the first time, however, are more likely to perceive the evidence as relevant.

Although our results support greater reliance on judges in circumstances where experience and training can facilitate avoidance of cognitive illusions, they also identify important advantages juries have over judges. Juries consist of groups, and group deliberation might reduce some illusions of judgment.[230] Consider, for example, the hindsight bias, which is virtually impossible to purge from legal decision making and influences both jurors and experienced judges alike. Part of the reason the hindsight bias occurs is that learning the outcome alters people's memories of the preceding events; people remember more information that is consistent with the known outcome than is inconsistent with the known outcome.[231] Because groups usually remember more of the relevant facts than individuals, group decision making can mitigate some of the hindsight bias's influence, suggesting that juries might more successfully avoid the hindsight bias than judges.

Another important advantage of a jury trial is that it creates a mechanism for keeping potentially misleading information away from the fact finder. A judge will always know about subsequent remedial measures and statutory damage caps, whereas this information can be kept from juries. Generally, when the only means of avoiding the effect of a cognitive illusion is to restrict access to the information that triggers it, a jury trial has a substantial advantage over a bench trial.

On balance, then, our results suggest that those clamoring for judges to replace juries should proceed with caution. Judges are likely to make better decisions in certain circumstances because their training and experience will enable them to avoid the more pernicious effects of such cognitive decision-making phenomena as the representativeness heuristic. On the other hand, group decision making or the insulation afforded by a judicial gatekeeper may enable juries to make better decisions than judges in other circumstances.

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230 *See* PLOUS, *supra* note 8, at 211-14 (reviewing comparisons of group and individual judgment and concluding that group decision making reduces biases in some cases). Groups pose problems of their own, however, and can sometimes make worse decisions than individuals. *See* David Schkade, Cass R. Sunstein, & Daniel Kahneman, *Deliberating About Dollars: The Severity Shift*, 100 COLUM. L. REV. 1139, 1164-66 (2000); Cass R. Sunstein, *Essay: Deliberative Trouble? Why Groups Go to Extremes*, 110 YALE L.J. 71 (2000).

231 Hawkins & Hastie, *supra* note 102, at 321.

C. Legal Rules That Avoid Illusions of Judgment

The legal system might also adopt procedural, evidentiary, and even substantive rules to minimize the deleterious effects of cognitive illusions on judicial decision making. By adopting such rules, the system can avoid placing judges in a position in which cognitive illusions are likely to lead them astray. It is much easier to avoid stepping on a patch of ice than it is to keep your footing once you have stepped on it. Indeed, some legal rules appear to represent an effort by judges or legislators to avoid the effects of these illusions of judgment.[232]

For example, Rule 407 of the Federal Rules of Evidence represents an adaptation to the effects of the hindsight bias.[233] By excluding from evidence subsequent remedial measures taken by the defendant, Rule 407 precludes the fact finder from taking this information into consideration when assessing ex post whether the defendant behaved reasonably at the time of the accident. Similarly, courts often rely on ex ante standards of conduct rather than ex post determinations of "reasonableness" as a means of reducing the hindsight bias.[234] In medical malpractice cases, for instance, courts are asked not to make ex post determinations about whether the defendant behaved "reasonably." Instead, they are charged with inquiring into whether the defendant behaved in a manner consistent with customary practices established ex ante by the medical profession.[235] Similarly, in corporate law, courts refuse to hold officers and directors of corporations liable for negligent business decisions because these decisions, though seemingly wise in foresight, may seem foolish in hindsight.[236]

Several legal rules also arguably reflect efforts to temper the effects of egocentric biases. Egocentric biases lead people to be more confident in their decisions than is normatively appropriate. People influenced by egocentric biases might make more extreme decisions than are warranted by the available information. For example, judges and juries might be so confident in their verdicts that they are willing to impose severe penalties (including death) or award extremely high damages, even in cases in which the facts are too uncertain to support such extreme decisions. The availability of multiple judicial appeals might be an effort to counteract the potentially overconfident assignment of the death penalty; the availability of this review reflects, at the very least, a recognition that the trial process can make mistakes, even

232 *See generally* Rachlinski, *supra* note 157 (discussing adaptations in the legal system to cognitive illusions).

233 FED. R. EVID. 407.

234 *See* Rachlinski, *supra* note 104, at 608-13.

235 *Id.* at 612.

236 *Id.* at 621.

when the decision maker is sure enough of the facts to sentence someone to death. Likewise, damage caps might reflect a systematic effort to temper overconfident civil verdicts. Political concerns support both the availability of multiple appeals in death-penalty cases and damage caps in civil cases, but each might also reflect conscious or subconscious efforts to combat the consequences of egocentric biases in the trial courts.

There is some danger that adopting reforms to reduce the effects of a single cognitive illusion will skew the litigation process because any single reform will fail to reduce the effects of other illusions. Furthermore, efforts to curb the effects of a single illusion might have an adverse effect on one category of litigants. For example, the hindsight bias generally benefits tort plaintiffs because it makes it seem as if the defendant had a greater ability to predict the adverse outcome than was actually true. Similarly, anchoring makes it easier for plaintiffs to obtain higher damage awards, because defendants typically cannot provide an anchor without implicitly admitting that they should be held liable. If the legal system reforms these illusions without remedying others that benefit defendants, then the reforms will skew the system against plaintiffs. Nevertheless, failing to adopt reforms that reduce the effect of cognitive illusions also skews the system and ensures that the system produces more errors than it otherwise might.

CONCLUSION

"The aim of the American legal system is liberty and justice for all. How close we come to that aim depends on good judging."[237] We are confident that most judges attempt to "reach their decisions utilizing facts, evidence, and highly constrained legal criteria, while putting aside personal biases, attitudes, emotions, and other individuating factors."[238] Despite their best efforts, however, judges are vulnerable to the influence of the cognitive illusions that we have described in this Article.

Our study demonstrates that judges rely on the same cognitive decision-making process as laypersons and other experts, which leaves them vulnerable to cognitive illusions that can produce poor judgments. Even if judges have no bias or prejudice against either litigant, fully understand the relevant law, and know all of the relevant facts, they might still make systematically erroneous decisions under some circumstances simply because of how they—like all human beings—think.

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237 KEETON, *supra* note 3, at 1.

238 Nugent, *supra* note 21, at 4; *see also* Harry T. Edwards, *The Judicial Function and the Elusive Goal of Principled Decisionmaking*, 1991 WIS. L. REV. 837, 838 ("[Judges] strive, most often successfully, to decide cases in accord with the law.").

All is not bleak, however, because judges, litigants, and legislators can take steps to minimize the effects of these cognitive illusions. Nevertheless, these illusions will persist. Additional psychological and legal scholarship is needed to explore the various ways that the cognitive processes of legal actors can and should influence the administration of justice. A greater understanding of these cognitive processes can only improve the legal system, whereas ignorance can only undermine it. As Judge Jerome Frank put it:

> To the extent that one goes to sleep in a dream of attainable perfection, he becomes the victim of uncertainties which he ignores and for which he therefore fails to allow. The courageous attitude of accepting uncertainties makes one's world picture more complex; life is disclosed as far more precarious and difficult to conciliate. But, just in proportion as we learn more about what was previously undetected, we reduce the dangers of being crushed by unobserved dangers. That is the paradox of wisdom: Insofar as we become mindful that life must be less perfect than we would like it to be, we approach nearer to perfection.[239]

239 FRANK, *supra* note 4, at 426.