

# INSIDE THE JUDICIAL MIND

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### INTRODUCTION

Alexander Hamilton observed that judges in a constitutional democracy possess “neither force nor will but merely judgment.”<sup>1</sup> The judicial role has expanded since Hamilton’s day,<sup>2</sup> 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 make occasional mistakes, but the public understandably expects judges to avoid systematic errors.<sup>3</sup> This expectation, however, might be unrealistic. Empirical evidence suggests that

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<sup>1</sup> FEDERALIST PAPERS, No. 78 (“[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.”).

<sup>2</sup> 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).

<sup>3</sup> 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

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even highly qualified judges inevitably rely on cognitive decision-making processes that can produce systematic errors in judgment.

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economic models of adjudication demonstrate that law can still be effective even if judges makes random mistakes. See 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, *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).

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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;<sup>4</sup> proponents of critical legal studies have complained that judges favor the existing power structure;<sup>5</sup> critical race and feminist scholars have argued that race and gender heavily influence judicial decisions;<sup>6</sup> and law-and-economics scholars have asserted that judges make self-serving

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<sup>4</sup> See JEROME FRANK, *COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE* (1949) (documenting the legal realist position on judging); Felix 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).

<sup>5</sup> See generally, MARK KELMAN, *A GUIDE TO CRITICAL LEGAL STUDIES* 45-48 (1987).

<sup>6</sup> See Martha Chamallas, *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);

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decisions designed to advance their political fortunes.<sup>7</sup> Our research, however, identifies a more fundamental potential source of systematic judicial error: Wholly apart from political orientation and self-interest, the very nature of human thought can mislead judges confronted by particular types of situations into making consistent and predictable mistakes .

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Cassia Spohn, *The Sentencing Decisions of Black and White Judges: Expected and Unexpected Similarities*, 24 L. & SOC'Y REV. 1197, 1198 (1990) (reviewing the critical race literature on judges). See also 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 of judges).

<sup>7</sup> See Jonathan R. Macey, *Judicial Preferences, Public Choice, and the Rules of Procedure*, 23 J. LEGAL STUD. 627, 630-32 (1994); Richard A. Posner, *What Do Judges and Justices Maximize? (The Same Thing Everybody Else Does)*, 3 SUP. CT. ECON. REV. 1 (1993). See also, LAWRENCE BAUM, *THE PUZZLE OF JUDICIAL BEHAVIOR* (1997) (reviewing scholarship on judicial behavior).

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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.<sup>8</sup> Reliance on these heuristics facilitates good judgment most of the time, but it also produce systematic errors in judgment.<sup>9</sup> 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

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<sup>8</sup> See Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *SCIENCE* 1124, 1124 (1974). For detailed descriptions of this work, see *JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* (Daniel Kahneman, Paul Slovic & Amos Tversky eds., 1982); SCOTT PLOUS, *THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING* (1993).

<sup>9</sup> See Tversky & Kahneman, *supra* note 8, at 1124 (“In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors.”)

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believe things that are not really true.<sup>10</sup> The deceptions that reliance on these heuristics can perpetrate on human judgment can be thought of as *cognitive illusions* of judgment.<sup>11</sup>

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<sup>10</sup> *See id.*

<sup>11</sup> Tversky & Kahneman, *supra* note 8, at 1124.

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Decades of research on juries indicates that these cognitive illusions affect the quality of adjudication.<sup>12</sup> Among the more serious errors that researchers have identified in jury decision making are that juries tend to: believe litigants should have been able to predict events that no one could have predicted;<sup>13</sup> allow irrelevant information to influence liability

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<sup>12</sup> See Robert MacCoun, *Experimental Research on Jury Decision Making*, 244 SCIENCE 1046 (1989) (reviewing research on juries).

<sup>13</sup> See Reid Hastie, David A. Schkade & John W. Payne, *Hindsight Effects on Judgments of Liability for Punitive Damages*, 23 LAW & HUM. BEHAV. 597 (1999); Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post ≠ Ex Ante: Determining Liability in Hindsight*, 19 LAW & HUM. BEHAV. 89 (1995); Susan LaBine & Gary LaBine, *Determinations of Negligence and the Hindsight Bias*, 20 LAW

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determinations;<sup>14</sup> defer to arbitrary numeric estimates;<sup>15</sup> and rely on arbitrary methods to calculate damages.<sup>16</sup>

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& HUM. BEHAV. 501 (1996); Merrie Jo Stallard & Debra L. Worthington, *Reducing the Hindsight Bias Utilizing Attorney's Closing Arguments*, 23 LAW & HUM. BEHAV. 671 (1998).

<sup>14</sup> 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 third verdict option that is clearly inferior to the other options alters choices made by mock jurors).

<sup>15</sup> See Gretchen B. Chapman & Brian H. Bornstein, *The More You Ask For the More You Get: Anchoring in Personal Injury Verdicts*, 10 APP. COG. PSYCHOL. 519 (1996); Reid Hastie et al., *Juror Judgments in Civil Cases: Effects of Plaintiff's Requests and Plaintiff's Identity on Punitive Damage Awards*, 23 LAW & HUM. BEHAV. 445 (1999); Verlin B. Hinsz & Kristin E. Indahl, *Assimilation to Anchors for Damage Awards in a Mock Civil Trial*, 25 J. APP. SOC. PSYCHOL. 991 (1995); Robert MacCoun, *Inside the Black Box: What Empirical Research Tells Us About Decisionmaking by Civil Juries*, in VERDICT: ASSESSING THE CIVIL JURY SYSTEM 137 (Robert E. Litan ed. 1993) (citing to J. J. Zuehl, *The Ad Damnum, Jury Instructions, and Personal Injury Damage Awards*, University of Chicago, Department of Sociology, August 4, 1982); John Malouff

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& Nicola S. Schutte, *Shaping Juror Attitudes: Effects of Requesting Different Damage Amounts in Personal Injury Trials*, 129 J. SOC. PSYCHOL. 491 (1989). See also Allan Raitz et al., *Determining Damages: The Influence of Expert Testimony on Jurors' Decision Making*, 14 LAW & HUM. BEHAV. 385 (1990) (demonstrating that expert testimony regarding damages anchors mock jurors' damage awards).

<sup>16</sup> 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).

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But what about judges? In the day-to-day operation of the legal system, judges are more important than juries.<sup>17</sup> They decide roughly as many cases at trial as juries do,<sup>18</sup> and they determine the outcome of roughly seven times as many cases as juries decide with rulings on dispositive motions.<sup>19</sup> Even in the relatively small number of cases that are tried by juries, judges decide what evidence juries will be allowed to hear. Furthermore, judges interpret and apply law, as well as finding facts, which means that understanding judicial decision making is the key to understanding 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 judges’ hunches *makes the law*. What then are the hunch-producers?”<sup>20</sup>

Despite the greater importance of judges, 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.<sup>21</sup> Most of the empirical

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<sup>17</sup> RONALD DWORKIN, *LAW’S EMPIRE* 1 (1986) (“It matters how judges decide cases.”)

<sup>18</sup> Theodore Eisenberg & Kevin Clermont, *Trial By Judge or Jury: Transcending Empiricism*, 77 CORNELL L. REV. 1124, 1135-37 (1992). See LEONIDAS RALPH MECHAM, *JUDICIAL BUSINESS OF THE UNITED STATES COURTS: 1999 ANNUAL REPORT OF THE DIRECTOR* 173, at Table C-7 (1999).

<sup>19</sup> 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, versus the 24% decided on dispositive motions.

<sup>20</sup> JEROME FRANK, *LAW AND THE MODERN MIND* 112-13 (1930) (emphasis added).

<sup>21</sup> See, e.g., John J. Brunetti, *Essay: 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 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 CLEVELAND ST. L. REV. 1, 4 (1994) (noting with surprise that “few studies analyze the manner and method of the judiciary’s decision-making process”); Andrew J. Wistrich, *How Cognitive Illusions Can Affect Legal Decision Making*, 16 LITIGATION SECTION NEWSLETTER FOR THE CIVIL TRIAL LAWYER 2, 5 (1999) (“Very little research has been done regarding the susceptibility of judges to cognitive illusions.”) *But see* John C. Anderson et al., *Evaluation of Auditor Decisions: Hindsight Bias Effects and the Expectation Gap*, 14 J. ECON. PSYCHOL. 711, 726-7 (1993); Theodore Eisenberg, *Differing Perceptions of Attorney Fees in Bankruptcy Cases*, 72 WASH. U. L.Q. 979 (1994); W. Kip Viscusi, *How Do Judges Think About Risk?* 1 AM. L. & ECON. REV. 26 (1999); Marianne M. Jennings et al., *Outcome Foreseeability and its Effects on Judicial Decisions* (unpublished manuscript on file with

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work on judicial decision making has been motivated by concerns that judges make decisions that are self-serving or politically driven.<sup>22</sup> Even the most learned of judges have acknowledged that they do not understand how judges make decisions.<sup>23</sup>

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the authors). *See also*, 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 minds of man and report accurately its conscious and subconscious operations.")

<sup>22</sup> *See* Sisk et al., *supra* note 6, at 1585-96 (reviewing studies of judge's race, sex, and political orientation and of judicial incentives).

<sup>23</sup> *See* Oliver Wendell Holmes, Jr., *The Path of 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).

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Psychologists suspect that even though judges are experienced, well-trained, highly motivated decision makers, they are vulnerable to cognitive illusions.<sup>24</sup> The research on human judgment and choice indirectly supports this suspicion. Empirical studies show that cognitive illusions plague the assessments that many professionals make, including doctors, real estate appraisers, engineers, accountants, options traders, military leaders, and psychologists.<sup>25</sup> Even lawyers fall prey to cognitive illusions.<sup>26</sup> Inasmuch as “[j]udging is choice”,<sup>27</sup> and judges

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<sup>24</sup> See VALERIE P. HANS & NEIL VIDMAR, *JUDGING THE JURY* 129 (1986).

<sup>25</sup> See John C. Anderson et al., *supra* note 20, at 725 (professional auditors commit the hindsight bias); Hal R. Arkes et al., *Hindsight Bias Among Physicians Weighing the Likelihood of Diagnoses*, 66 J. APPLIED PSYCHOL. 252, 253 (1981) (“physicians exhibit the hindsight bias”) [hereinafter Arkes et al., *Physicians*]; Hal R. Arkes et al., *Eliminating the Hindsight Bias*, 73 J. APPLIED PSYCHOL. 305, 306 (1988) (demonstrating that psychologists commit the hindsight bias) [hereinafter Arkes et al., *Eliminating*]; Loren J. Chapman & Jean P. Chapman, *Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs*, 74 J. ABNORMAL PSYCHOL. 271 (1969) (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 (1996) (option trades rely on heuristics in probabilistic reasoning); Raanon Lipshitz & Dalya Barak, *Hindsight Wisdom: Outcome Knowledge and the Evaluation of Decisions*, 88 ACTA PSYCHOLOGICA 105, 110 (1995) (officers in Israeli defense forces commit the hindsight bias); Barbara J. McNeil et al., *On the Elicitation of Preferences for Alternative Therapies*, 306 NEW ENG. J. MED. 1259 (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 fell prey to anchoring effects when estimating real estate prices). See generally, PLOUS, *supra* note 8, at 258 (“several studies have found that experts display either roughly the same biases as college students or the same biases at somewhat reduced levels.”)

<sup>26</sup> See, e.g., Linda Babcock et al., *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 non-lawyer subjects); Craig R. Fox & Richard Birke, *Lawyers Exhibit Subadditivity When Forecasting Trial Outcomes*, unpublished manuscript on file with the authors (demonstrating that lawyers exhibit decision-making biases when assessing probabilities). But see Darrin R. Lehman, Richard O. Lempert & Richard E. Nisbett, *The Effects of Graduate Training on Reasoning*, 43 AM. PSYCHOLOGIST 431, 440 (1988) (finding that training in Psychology, Medicine, and Law can improve logical decision making) and also Russell Korobkin & Chris Guthrie, *Psychology, Economics, and Settlement: A New Look at the Role of the Lawyer*, 76 TEX. L. REV. 77 (1997) (reporting that lawyers are less susceptible than non-lawyers to framing effects).

<sup>27</sup> KEETON, *supra* note 3, at § 1.1.

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are human beings, the conclusions drawn from psychological research on human judgment and choice likely apply to judges as well.<sup>28</sup> Furthermore, judges make decisions under the kinds of time pressure that induces reliance on the cognitive shortcuts that cause illusions of judgment. Nevertheless, without hard empirical evidence, the assertion that cognitive illusions affect judges is mere conjecture.

To begin to fill this gap in the understanding of judicial decision making, we conducted an empirical study to determine whether five common cognitive illusions would influence decision making of a sample of 167 federal magistrate judges. These five illusions are: anchoring (making estimates based on irrelevant starting points); framing effects (treating economically equivalent gains and losses differently); hindsight bias (perceiving

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<sup>28</sup> See, e.g., MORRIS R. COHEN, *LAW AND 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 19, at 108 (arguing that to understand judicial decisions “we must observe how ordinary man dealing with ordinary affairs arrive at their judgements”); Robert Cover, *The Supreme Court, 1982 Term: Forward: Norms and Narrative*, 97 *HARV. L. REV.* 4, 67 (1983) (noting that judges are “quite like the rest of us”); Richard A. Posner, *The Jurisprudence of Skepticism*, 86 *MICH. L. REV.* 827, 859 (1988) (noting that “there is no distinctive methodology of legal reasoning”).

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past events to have been more predictable than they actually were); representativeness (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 show 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 "when all is said and done, we must face the fact that judges are human."<sup>29</sup>

The results of our research raise profound questions for judges, litigants, and the justice system as a whole: What steps, if any, can judges take to improve their decision making? Should they? Does our conclusion that judges are sometimes as subject to the adverse effects of cognitive illusions have any implications for the debate about the use of judges as opposed to juries as decision makers? Should the justice system adopt rules of civil procedure, rules of evidence, or substantive legal standards in an attempt to minimize the adverse effects that cognitive illusions might have on the quality of judicial decision making? Has it 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 the justice system can take steps—and in some instances, have already taken steps—to avoid or minimize the impact of such errors.

### I. THE STUDY

#### A. Participants

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<sup>29</sup> FRANK, *supra* note 4, at 410.

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We recruited 167 federal magistrate judges to participate in our study. Congress created the modern office of federal magistrate judgeships when it enacted the Federal Magistrates Act of 1968.<sup>30</sup> Although the role that the magistrate judges play varies from district to district, they perform many (although by no means all) of the functions performed by federal district judges.<sup>31</sup> Over the years, Congress has steadily increased the responsibilities that the magistrate judges may undertake, which now include the power to conduct civil trials with the litigants' consent.<sup>32</sup> In 1999, the 519 federal magistrate judges handled 282,933 preliminary criminal proceedings, 63,931 civil pre-trial conferences, and entered final judgment in 11,320 cases litigated by consent in front of magistrate judges (approximately 1,500 of which resulted in trials).<sup>33</sup>

Federal magistrate judges are selected by a careful appointments process designed to be based on merit. To obtain their 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."<sup>34</sup> Based on these recommendations, the district judges in the relevant district vote for their preferred

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<sup>30</sup> Pub. L. No. 90-578, 82 Stat. 1108 (1968)

<sup>31</sup> Dessem, *supra* note 33, at 834. For more background on Federal Magistrate Judges, see 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 magistrate judges). There are functions that federal magistrate judge cannot perform that federal district judges can--most notably, conducting a felony criminal trial.

<sup>32</sup> 28 U.S.C. § 636(c); FED. R. CIV. PROC. 73. More recently, the Civil Justice Reform Act of 1990, Pub. L. No. 101-650, 104 Stat. 5090, further expanded the power Federal Magistrates Judges enjoy. *See, e.g.*, R. Lawrence Dessem, *The Role of the Federal Magistrate Judge in Civil Justice Reform*, 67 ST. JOHN'S L. REV. 799 (1990) (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).

<sup>33</sup> *See* MECHAM, *supra* note 17, Tables M-3, M-4A, and M-5.

<sup>34</sup> 28 U.S.C. § 631(b)(5).

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applicant(s).<sup>35</sup> Thus, federal magistrate judges, as a group, reflect an effort to identify and appoint skilled decision makers.

Although the entire sample of judges who graciously and generously 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. As noted below, our sample was drawn from a large group of magistrate judges attending an educational conference, who had no special interest in psychology or such research. Additionally, as a handful of other studies demonstrate, cognitive illusions affect judges of all kinds.<sup>36</sup>

**B. Procedure**

The federal 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 each of the judges in attendance. 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 completed questionnaires from all of the participants.

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<sup>35</sup> 28 U.S.C. § 631(a).

<sup>36</sup> See studies cited *infra* notes XX and XX (hindsight footnote to other studies; footnote cite to Eisenberg study).

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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.<sup>37</sup> On the subsequent pages, the questionnaire presented each judge with five items, consisting of a background description and

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<sup>37</sup> 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. (emphasis in original.)

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one or more questions. Each item tested for the influence of one of five cognitive illusions on judicial decision making described below.<sup>38</sup> 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).<sup>39</sup>

The fifth and final page of the questionnaire gave the judges the opportunity to have their answers used only for the educational workshop and not for further research.<sup>40</sup> One

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<sup>38</sup> See Section II, *infra*.

<sup>39</sup> 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.

<sup>40</sup> 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

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judge out of the 168 who returned questionnaires chose to exercise this option, so we removed his or her questionnaire from consideration in this Article (leaving a sample of 167 judges).

We have no idea which judge exercised this option because we did not ask any of the judges to provide their names or any identifying information.

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paragraph and your survey will be removed from any further analysis or discussion.

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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 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.<sup>41</sup>

## II. RESULTS

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

### A. Anchoring

When people make 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 final estimates.<sup>42</sup> Reliance on an anchor is often reasonable because many

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<sup>41</sup> MECHAM, *supra* note 34, at 44. (Reporting that in the fall of 1999, there were 65 part-time and 454 full-time Federal Magistrate Judges.)

<sup>42</sup> See Tversky & Kahneman, *supra* note 8, at 1128-30 (explaining anchoring effects).

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anchors convey relevant information about the actual value of an item. 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, for instance, Professors Amos Tversky and Daniel Kahneman asked participants to estimate the percentage of African countries in the United Nations.<sup>43</sup> 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.”

Tversky and Kahneman had secretly rigged this “wheel of fortune” to stop either on 10 or 65. When the wheel landed on 10, participants provided a median estimate of 25%; when the wheel landed on 65, participants provided a median estimate of 45%.<sup>44</sup> Even though the initial values were clearly irrelevant to the decision task, they had a pronounced impact on the participants’ responses.<sup>45</sup>

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 think about factual circumstances that would support the conclusion that the anchor is correct.<sup>46</sup> Even when people conclude that an anchor is not accurate, mentally testing the validity of the anchor

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<sup>43</sup> *Id.* at 1128.

<sup>44</sup> *Id.*

<sup>45</sup> Tversky and Kahneman also used other number pairs and asked subjects to estimate other quantities in this “wheel of fortune” experiment. *Id.* at 1128.

<sup>46</sup> See Fritz Strack & Thomas Mussweiler, *Explaining the Enigmatic Anchoring Effect: Mechanisms of Selective Accessibility*, 73 J. PERSONALITY & SOC. PSYCHOL. 437, 437-39 (1997).

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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 \$7,128.53.<sup>47</sup> This anchor, although ridiculously high, reminds students of textbooks with high pricetags. Similarly, people provided higher estimates of the average annual temperature in San Francisco when first asked to determine whether it was higher or lower than 558 degrees;<sup>48</sup> this anchor makes people recall very warm days.

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<sup>47</sup> PLOUS, *supra* note 8, at 146 (citing to an unpublished study by George Quattrone and colleagues).

<sup>48</sup> *Id.*

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Anchoring can affect lawsuits because litigation frequently produces anchors.<sup>49</sup> In settlement talks, for instance, litigants can be influenced by the opening offers that their adversaries make. Professors Russell Korobkin and Chris Guthrie, for example, found that people evaluating hypothetical settlement offers were more likely to accept a \$12,000 final settlement offer when it followed a \$2,000 opening offer than when it followed a \$10,000 opening offer.<sup>50</sup> Korobkin and Guthrie hypothesized that those who received the \$2,000 opening offer expected to settle for a relatively small amount, so the \$12,000 final offer seemed generous by comparison, while those who received the \$10,000 opening offer expected to settle for relatively more, so the \$12,000 final offer seemed relatively stingy.<sup>51</sup> The opening offers effectively “anchored subjects’ expectations” and influenced their settlement preferences.<sup>52</sup>

Legal scholars have long thought that anchors influence jurors.<sup>53</sup> In five separate studies, researchers have found that plaintiff’s lawyers’ damage requests influenced mock jurors’ assessments of the appropriate amount of damages to award in civil suits.<sup>54</sup> In one study, for instance, mock jurors awarded slightly more than \$90,000 when the plaintiff’s lawyer requested \$100,000 in damages; when the plaintiff’s lawyer requested \$500,000 in damages in the very same case, mock jurors awarded nearly \$300,000.<sup>55</sup> Even silly and outrageous damage requests can influence juror decision making. In another study, for instance, mock jurors awarded plaintiff substantially more in damages when the plaintiff’s lawyers requested an outlandish \$1 billion than when the plaintiff’s lawyer made a more appropriate damage

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<sup>49</sup> See generally, Wistrich, *supra* note 20, at 2 (describing the impact anchoring can have in the courtroom).

<sup>50</sup> 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, 11-13 (1994).

<sup>51</sup> *Id.* at 19.

<sup>52</sup> *Id.*

<sup>53</sup> See Dale W. Broeder, *The University of Chicago Jury Project*, 38 NEB. L. REV. 744, 755-57 (1959) (reporting evidence based on intensive interviews with jurors that plaintiff’s damage requests anchored juror damage determinations in six of seven cases).

<sup>54</sup> See Chapman & Bornstein, *supra* note 14; Reid Hastie et al., *supra* note 14; Hinsz & Indahl, *supra* note 14; Malouff & Schutte, *supra* note 14; Raitz et al., *supra* note 14; Zuehl, *supra* note 14.

<sup>55</sup> Malouff & Schutte, *supra* note 14, at 495.

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request.<sup>56</sup> The moral of these anchoring studies seems to be “ask and ye shall receive.” In each study, “when more money was requested for damages by the plaintiff’s attorney, the jurors awarded more.”<sup>57</sup>

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<sup>56</sup> Bornstein & Chapman, *supra* note 14, at 525.

<sup>57</sup> Malouff & Schutte, *supra* note 14, at 495. Researchers have found not only that plaintiff’s request for damages can anchor jurors but also that statutory damage caps can anchor jurors. *See, e.g.*, Hinsz & Indahl, *supra* note 14, at 1001-6; Jennifer K. Robbennolt & Christina A. Studebaker, *Anchoring in the Courtroom: The Effects of Caps on Punitive Damages*, 23 LAW & HUM. BEHAV. 353, 358-61 (1999). Statutory damage caps can also lead to anchoring and adjustment effects in settlement. *See* Linda Babcock & Gregory Pogarsky, *Damage Caps Cast a Long Shadow: An Experimental Investigation of Their Impact on Expectations and Settlements*, 28 J. LEGAL STUD. 341, 362-68 (1991).

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Recognition of the potentially pernicious effect of anchoring on damage awards has triggered calls for reform.<sup>58</sup> Some of these reform efforts have included calls to replace juries with judges,<sup>59</sup> presumably on the theory that judges will be immune from anchoring effects. Indeed, because experience can mitigate the influence of arbitrary anchors,<sup>60</sup> there is reason to believe that this might be accurate.

### 1. Anchoring Effects in Judges: 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

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<sup>58</sup> Sunstein et al., *supra* note 15, at 2109-31.

<sup>59</sup> *Id.* at 2127.

<sup>60</sup> See Clark McCauley, 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).

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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 you award the plaintiff in compensatory damages?” We provided the judges in the Anchor group with the same information. In addition, we informed them 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.”<sup>61</sup> 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 Effects: Results**

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<sup>61</sup> See 28 U.S.C. § 1332 (providing that the federal district courts “have original jurisdiction of all civil actions where the matter in controversy exceeds the sum or value of \$75,000”).

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The results showed that ruling on the motion had a large effect on damage awards. The 66 judges in the No Anchor condition indicated that they would award plaintiff an average of \$1.25 million while the 50 judges in the Anchor condition awarded an average of \$882,000.<sup>62</sup> The difference between the two groups was statistically significant.<sup>63</sup>

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<sup>62</sup> The response rate differed between the two conditions. Overall, 31.1% of the judges declined to answer the question (51 out of the 164 judges who either did not have the motion before them, or denied the motion), many citing a lack of adequate information. Without the preliminary motion, only 17.0% (14 of the 80 who did not rule on the motion) of the judges failed to provide an estimate, but when asked to rule on the motion first, 44.0% (37 of the 84 judges that denied the motion) of the judges 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.

Note that 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 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*

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Only two (2.3%) of the judges in the Anchor condition granted the motion to dismiss.<sup>64</sup> By voting overwhelmingly to deny the motion to dismiss, the judges indicated that the \$75,000 jurisdictional minimum contained no reliable information regarding the plaintiff's damages. Nonetheless, the \$75,000 jurisdictional minimum anchored their damage awards. Asking the judges to rule on this frivolous motion depressed mean damage awards by more than \$350,000 (or 29.4%) in this hypothetical case.

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*id.* at 552-52 (explaining Fisher's exact test); *t*-test for differences between two parametric samples, as reported with the *t*-statistic, *see id.* at 271-300 (explaining *t*-test); the Mann-Whitney test for differences between two non-parametric samples, as reported with the Mann-Whitney *U* (adjusted for ties in all cases), *see id.* at 587-89 (explaining Mann-Whitney test); and the  $\chi^2$  test for different distributions of categorical data, as reported with the  $\chi^2$  square statistic, *see id.* at 305-13.

<sup>63</sup>  $t(113) = 2.18, p = .031$ .

<sup>64</sup> One of these two judges asserted that s/he wanted the plaintiff to amend the complaint to specify an amount. One of the 87 judges who received this condition did not respond, citing insufficient information.

Like most damage-award data, our results were positively skewed (meaning that there were many results near the lower end of the distribution and a few that stretched out towards the higher end). Because such skewed results can render mean results unreliable, we report the median and quartile statistics in Table 1.<sup>65</sup>

**Table 1: Anchoring Effects: Quartile Results**

Condition	1 <sup>st</sup> Quartile (25th percentile)	2 <sup>nd</sup> Quartile (median)	3d quartile (75th percentile)
No Anchor	\$500,000	\$1 million	\$1.925 million
Anchor	\$288,000	\$882,000	\$1 million

The motion had a pronounced effect on the judges at all response levels. For example, the Anchor judges at the first and third quartiles awarded in the Anchor condition were roughly half the size of those as in 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 damage that were lower than half of those awarded by the judges in the No Anchor condition.

### 3. Anchoring Effects: Discussion

The judges in our study relied on an anchor—the \$75,000 jurisdictional minimum triggered by the motion to dismiss—to estimate damage awards in a hypothetical personal injury case. Just as people think about hot days when asked whether the daytime temperature in San Francisco is higher or lower than 558 degrees, ruling on this motion probably caused the judges to think about cases in which the damages were quite low. The judges may have mentally filled in factual details of our hypothetical with ones similar to these prior cases, thereby resulting in comparatively low damage estimates.

The judges in our study might have believed that the anchor signaled relevant information. If so, they should have relied on it to estimate damages. They might, for example, have reasoned that a defendant would have been more inclined to file such a motion in a case where the damages were actually low. If the judges believed this, then it might have been reasonable for them to infer from the motion that the defendant (perhaps reasonably)

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<sup>65</sup> A non-parametric test (more appropriate to positively skewed data such as ours) also revealed that the damage estimates in two conditions differed significantly. Mann-Whitney,  $U = 4216.5$ ,  $p = .048$ .

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believed that the damages were low. The problem with this explanation is that all but two of the judges denied the defendant's motion, suggesting that most of the judges viewed the motion as frivolous.

In short, the psychological literature on anchoring, combined with the magnitude of the difference between the Anchor and No Anchor groups, suggests that the former explanation provides a better account of our results than this alternative explanation. Regardless, the results do not suggest that defendants should file motions to dismiss for lack of subject matter jurisdiction as a way of anchoring judges in actual cases. Frivolous motions violate the rules of ethical conduct and are subject to sanctions.<sup>66</sup>

Additionally, such motions would not necessarily anchor judges in actual cases. In an actual case, such a motion probably would be separated in time from the awarding of damages, thereby dulling any effect it might have. Also, at trial, several other anchors would likely be available. We do not entirely discount the possible effects that such motions might have on judicial thought processes, but obviously, we recognize that many other factors might affect the outcome in a real case.

Rather than suggesting an insidious litigation strategy, these data show how anchors can easily creep into the process and have a dramatic effect on the way judges think about damage awards. Although commentators have worried about the effects that plaintiff's lawyers' damage requests have on juries, our data suggest that they might affect judges as well. Even more problematic is the potential effect statutory damage caps might have on judicial damage determinations. Judges can keep juries ignorant of damage caps,<sup>67</sup> 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 kept ignorant of the cap.

The potentially pernicious effects of anchoring also suggests a source of randomness in both the civil and criminal justice systems. In civil cases, judges influenced by irrelevant

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<sup>66</sup> See 28 U.S.C. § 1928 (authorizing fee and cost shifting against litigants who unreasonably multiply proceedings); Fed. R. Civ. Pro. 11 (providing for sanctions against the filing of frivolous motions).

<sup>67</sup> It is also possible, however, that jurors might be aware of a damage cap; or, even worse, are misinformed about a damage cap.

anchors will produce erratic damage awards. In criminal cases, judges influenced by irrelevant anchors will produce erratic criminal sentences. In both cases, legislative constraints, such as damage caps or mandatory sentencing guidelines might be justified as ways to reduce the influence that random anchors can have on judicial damage awards and sentences.

### B. Framing Effects

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 some salient reference point like the status quo.<sup>68</sup> This categorization, or “framing”, of decision options influences their evaluation of those options, including 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

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<sup>68</sup> See Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 AM. PSYCHOLOGIST 341 (1984) [hereinafter Kahneman & Tversky, *Choices, Values, and Frames*]; Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979) [hereinafter Kahneman & Tversky, *Prospect Theory*]; Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCIENCE 453 (1981) [hereinafter Tversky & Kahneman, *Framing of Decisions*]; Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. BUSINESS S251 (1986) [hereinafter Tversky & Kahneman, *Rational Choice*].

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represent losses.<sup>69</sup> 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.<sup>70</sup>

In any choice they face, people's risk preferences should depend upon their wealth relative to the size of the stakes involved.<sup>71</sup> In practice, however, people tend not to make such normatively-appropriate calculations. Instead, people make choices designed to maintain, or

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<sup>69</sup> See Kahneman & Tversky, *Choices, Values, and Frames*, *supra* note 70, at 342-44; Kahneman & Tversky, *Prospect Theory*, *supra* note 70, at 268-69; Tversky & Kahneman, *Framing of Decisions*, *supra* note 70, at 453-55; Tversky & Kahneman, *Rational Choice*, *supra* note 70, at S257-S260.

<sup>70</sup> Amos Tversky & Daniel Kahneman, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, 5 J. RISK & UNCERTAINTY 297, 308 (1992).

<sup>71</sup> See Tversky & Kahneman, *Rational Choice*, *supra* note 70, at S253.

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slightly improve, the status quo, which translates into risk-averse choices for most gains and risk-seeking choices for most losses.<sup>72</sup>

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<sup>72</sup> *Id.* at S254-S262.

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Framing effects can have a profound impact on civil lawsuits because litigation produces a natural frame.<sup>73</sup> In most lawsuits, plaintiffs choose either to accept some certain settlement from the defendant or to gamble that further litigation will produce a larger gain. Most defendants, by contrast, choose either to pay some certain settlement to the plaintiff or to gamble that further litigation will reduce the amount that they must pay. Plaintiffs, in other words, often choose between options that appear to represent gains, while defendants often choose between options that appear to represent losses. Thus, plaintiffs are likely to prefer settlement, the risk-averse option, while defendants are relatively more likely to prefer trial, the risk-seeking option.<sup>74</sup>

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<sup>73</sup> See Jeffrey J. Rachlinski, *Gains, Losses, and the Psychology of Litigation*, 70 SO. CAL. L. REV. 113, XX (1996).

<sup>74</sup> 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 these 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. Decision makers selecting between low-probability gains tend to make risk-

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seeking choices, while those selecting between low-probability losses tend to make risk-averse choices. *See* Tversky & Kahneman, *supra* note 72, at 306. Thus, in frivolous or low-probability litigation, plaintiffs are relatively more attracted to trial than are defendants.

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To demonstrate this phenomenon, Professor Jeffrey Rachlinski presented a simple litigation problem to law students, half of whom played the role of plaintiff and half the role of defendant.<sup>75</sup> 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). Rachlinski found that 77% of plaintiff-subjects (choosing between gains), but only 31% of defendant-subjects (choosing between losses), preferred settlement.<sup>76</sup> Rachlinski and others have generated additional experimental data demonstrating these framing effects,<sup>77</sup> and Rachlinski has also found evidence of framing effects among litigants in real cases.<sup>78</sup> 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.<sup>79</sup>

### 1. Framing Effects in Judges: Our Materials

Judges, of course, are neither plaintiffs nor defendants in the typical civil suit, but they often play an active role supervising settlement talks. Do framing effects lead judges to perceive the settlement decisions of plaintiffs and defendants differently? To determine whether judges' settlement recommendations might be influenced by framing effects, 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

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<sup>75</sup> Rachlinski, *supra* note 71, at 128-29.

<sup>76</sup> *Id.*

<sup>77</sup> Rachlinski, *supra* note 76, at 135-44. For other research, see Babcock et al., *supra* note 16, at 296-97; Robin M. Hogarth, *Ambiguity and Competitive Decision Making: Some Implications and Tests*, 19 ANNALS OF OPERATIONS RESEARCH 31, 40-41 (1989); Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. L. REV. 107, 128-42 (1994); Korobkin & Guthrie, *A New Look*, *supra* note 25, at 95-101; Peter J. van Koppen, *Risk Taking in Civil Law Negotiations*, 14 LAW & HUM. BEHAV. 151, 160-62 (1990).

<sup>78</sup> Rachlinski, *supra* note 76, at 150-60.

<sup>79</sup> *But see* Guthrie, *supra* note 75, at 185-95 (demonstrating experimentally that plaintiffs are more likely to be stubborn about settlement in frivolous or low-probability cases).

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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, all 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 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 verdict of \$50,000 – i.e.,  $50\% \times \$200,000$  judgment +  $50\% \times \$0$  judgment - \$50,000 attorney fees = \$50,000.

The other half of the judges ("Defendant/Losses" condition) reviewed the case from the defendant's perspective, in which the choices involve 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.,  $50\% \times -\$200,000$  judgment +  $50\% \times \$0$  judgment - \$50,000 attorney fees = -\$150,000. All judges were then asked to circle "yes" or "no".

Judges in both conditions evaluated choices that were economically identical. 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 such a dispute requires the judge to help the parties decide how to divide that fixed pie. For judges assigned to both the plaintiff and defendant frames, the litigant confronted 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 – who held the property at the outset of the lawsuit.

### 2. Framing Effects: Results

The results varied by frame. Among the judges evaluating the case from the plaintiff's perspective, 39.8% (33 out of 83) indicated that they thought the plaintiff should accept the \$60,000 settlement offer, but only 25% (20 out of 80) 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.<sup>80</sup> The difference between these two groups is statistically significant.<sup>81</sup> Like litigants, judges, are influenced by the way decision problems are framed.

### 3. Framing Effects: Discussion

The framing of the settlement decision affected judges in our study. Although the litigants in this problem faced settlement 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. Consistent with the psychological literature on framing, the judges were more likely to favor a settlement for the plaintiff than for the defendant.

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<sup>80</sup> Four judges (two in each condition) out of 167 (2.4%) declined to respond.

<sup>81</sup>  $z = 1.99$ ,  $p = .047$ .

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Framing effects such as the one in operation in our study can have a detrimental impact on judicial management of lawsuits. Judges, who frequently supervise settlement conferences, have tremendous power to influence the settlement process.<sup>82</sup> If framing affects judges' assessments of which party should make more concessions to settle the 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,<sup>83</sup> the data in our study suggest that judges are likely to lean more heavily on plaintiffs.

This might lead judges to coerce plaintiffs into settling for less than is appropriate or fail to put enough pressure on defendants to induce them to abandon their risk-seeking proclivities. The results could be either too few settlements or settlements that undermine the goals of the substantive law by under-compensating plaintiffs and under-detering defendants.

Framing effects also have influenced the development of legal doctrine.<sup>84</sup> When ownership of a commodity is in doubt, the courts traditionally favor those who hold possession of the good—even when possession is arbitrary.<sup>85</sup> For example, if a buyer contracts to sell a car to two different sellers, courts award permanent ownership to the party holding possession at the time the suit is brought.<sup>86</sup> Several areas of law, in fact, create similarly arbitrary distinctions between gains and losses, which seem irrational, but are consistent with framing effects.<sup>87</sup> The

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<sup>82</sup> See Resnik, *Managerial Judges*, *supra* note 2, at 386-402.

<sup>83</sup> Rachlinski, *supra* note 76, at 154.

<sup>84</sup> See David Cohen & Jack L. Knetsch, *Judicial Choice and Disparities Between Measures of Economic Values*, 30 OSGOODE H. L.J. 737 (1992).

<sup>85</sup> *Id.* at 738-40.

<sup>86</sup> *Id.*

<sup>87</sup> *Id.* at 749-69 (documenting these differences).

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judges who created these disparities may have done so out of a 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-seeking (or trial-seeking) than others, but we suspect 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.<sup>88</sup>

For either party, accepting the settlement would effectively concede 70% of the property's value to the opposing party.<sup>89</sup> Because the facts suggest that each party has the same claim to the property, the judges may have felt that an even split was more appropriate. Researchers have consistently found in experiments where participants must arbitrarily split a fixed pie that people consider anything other than an equal split unfair.<sup>90</sup> Judges in our study responded much like participants in these studies. Perhaps our judges were more closely attuned to the fairness of the offers than their monetary benefits. If so, litigants trying to negotiate a

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<sup>88</sup> 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 around the expected damage award at trial of \$100,000. The \$60,000 offer to the plaintiff thus represents one tenth of the bargaining window, as does the \$140,000 offer for the defendant.

<sup>89</sup> 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%).

<sup>90</sup> See generally, Colin Camerer & Richard H. Thaler, *Ultimatums, Dictators, and Manners*, 9 J. ECON. PERSP. 209 (1995) (describing this research).

settlement with the assistance of a presiding judge might endeavor to make what they think the judge will consider a “fair” offer rather than an offer they think the judge will deem economically favorable. Such a finding, however, merits more structured inquiry than our study was designed to address.

### 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.<sup>91</sup> Psychologists call this tendency for people to overestimate the predictability of past events the “hindsight bias.”<sup>92</sup> It occurs because learning an outcome causes people to update their beliefs about the world.<sup>93</sup> 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.<sup>94</sup>

Few judgments in ordinary life require people to assess the predictability of past outcomes, but such judgments are pervasive in the law.<sup>95</sup> Several studies have demonstrated that the hindsight bias influences judgments of legal liability.<sup>96</sup> Kim Kamin and Professor Rachlinski, for example, compared foresight decisions regarding whether to take a precaution against flooding with comparable hindsight evaluations of whether the failure to take such precautions was negligent.<sup>97</sup> In their study, they instructed participants judging in foresight to

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<sup>91</sup> See 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).

<sup>92</sup> See Stephen J. Hoch & George F. Loewenstein, *Outcome Feedback: Hindsight and Information*, 15 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, AND COGNITION 605, 605(1989). See also Baruch Fischhoff, *Hindsight ≠ Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPER. PSYCHOL. 288 (1975) (first documenting the effects of hindsight on judgment empirically).

<sup>93</sup> See Scott A. Hawkins & Reid Hastie, *Hindsight: Biased Judgments of Past Events After the Outcomes Are Known*, 107 PSYCHOL. BULL. 311, 312-13 (1990).

<sup>94</sup> *Id.*

<sup>95</sup> See Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 571 (1998).

<sup>96</sup> See Hastie et al., *supra* note 12; Kamin & Rachlinski, *supra* note 12; LaBine & LaBine, *supra* note 12; Stallard & Worthington, *supra* note 12.

<sup>97</sup> Kamin & Rachlinski, *supra* note 12.

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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). The researchers told the participants judging in hindsight that the precaution had not been taken and that a \$1 million flood had occurred.

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. Although both sets of participants reviewed identical information about the likelihood of a flood, the participants reached different conclusions about appropriate defendant behavior. 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.<sup>98</sup> 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*.

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<sup>98</sup> *Id.* at 98.

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Because courts usually evaluate events after the fact, they are vulnerable to the effects of the hindsight bias.<sup>99</sup> Besides negligence determinations, the hindsight bias likely influences findings of counsel incompetency (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 Rule 11 sanctions (a motion or allegation can seem more frivolous after a judicial ruling), and assessments of the liability of corporate officers charged with making false predictions about their company's performance (which can look like fraud after the predictions fail to come true).<sup>100</sup> In short, the hindsight bias is a threat to accurate liability determinations in many areas of law.

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<sup>99</sup> See Rachlinski, *supra* note 96, at 590-94.

<sup>100</sup> See *id.* at 602-24 (reviewing applications of the hindsight bias to legal issues).

Recognition of the influence of the hindsight bias on legal judgments has also inspired a set of proposed reforms,<sup>101</sup> which include greater reliance on judges.<sup>102</sup> Because the hindsight bias is one of the most robust cognitive illusions, greater reliance on judges is unlikely to ameliorate the effect of the bias on adjudication.<sup>103</sup> Although experience reduces the effect of the hindsight bias somewhat,<sup>104</sup> it by no means eliminates it. Several studies show that experts commit the hindsight bias.<sup>105</sup> It seems likely that it influences judges as well.

### 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,<sup>106</sup> 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

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<sup>101</sup> See 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, and Richard Thaler., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1527-33 (1996).

<sup>102</sup> See Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477, 1501 (1999); Viscusi, *supra* note 20, at 60.

<sup>103</sup> See Hoch & Loewenstein, *supra* note 95, at 606 (“the hindsight bias is a robust phenomenon that is not easily eliminated or even moderated.”) 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, *AFFAIR OF STATE: THE INVESTIGATION, IMPEACHMENT, AND TRIAL OF PRESIDENT CLINTON 1-2* (1999) (warning of the dangers of the hindsight bias).

<sup>104</sup> See Jay J. Christensen-Szalanski & Cynthia Fobian Williams, *The Hindsight Bias: A Meta-Analysis*, 48 ORGANIZATIONAL BEHAV. & HUMAN DECISION PROCESSES 147, 155 (1991).

<sup>105</sup> See Anderson et al., *supra* note 20, at 725 (professional auditors commit the hindsight bias); Arkes et al., *Physicians*, *supra* note 24, at 253 (“physicians exhibit the hindsight bias”); Arkes et al., *Eliminating*, *supra* note 24, at 306 (demonstrating that psychologists commit the hindsight bias); Lipshitz & Barak, *supra* note 24, at 110 (officers in Israeli defense forces commit the hindsight bias).

<sup>106</sup> *Mendoza v. Lynaugh*, 989 F.2d 191 (5<sup>th</sup> Cir. 1993).

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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 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 "Affirmed" condition; the "Vacated" condition; or the "Lesser Sanction" 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 each 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 – i.e., 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 of an alleged 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.<sup>107</sup> 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.<sup>108</sup> Consider, for example, the judges' assessment of the likelihood that the Court of Appeals affirmed the district court's decision. When told that the Court of Appeals had *affirmed*, 81.5% of the

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<sup>107</sup>  $\chi^2(4) = 46.91, p < .001$ .

<sup>108</sup> Of the 58 judges in the "Lesser" condition, one declined to respond to this question; one of the 55 judges in the "Affirm" condition declined to respond; and all of the 54 judges in the "Vacate" responded.

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 a lesser sanction*, indicated that an affirmance was the most likely outcome. Learning 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	<b>38.6</b>	40.4	21.1
Affirmed	7.4	<b>81.5</b>	11.1
Vacated	20.4	27.8	<b>51.9</b>

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

Overall, the sum of the percentage of judges in each of the three conditions who selected the outcome that they were provided as “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 what the likely outcome would have been. 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 rather a rational use of new knowledge.<sup>109</sup> Such 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; that process is simply learning from experience, which is perfectly rational.<sup>110</sup> 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

<sup>109</sup> See Mark Kelman, David E. Follas & Hilary Folger, *Decomposing Hindsight Bias*, 16 J. RISK & UNCERTAINTY 251, 253-54 (1998); Posner, *supra* note 105, at 1526 (“[H]indsight bias is often rational.”).

<sup>110</sup> See Hawkins & Hastie, *supra* note 96, at 311.

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asked the judges in our study to determine what the likely outcome of the appeal would have been, the outcome that we provided them was irrelevant to determining what they thought would have happened. Learning the outcome changed the judges' beliefs about Rule 11 sanctions in pro se prisoner cases. The judges then relied on this new perspective to re-predict the past outcome.

The form of our question might be criticized because we did not specifically ask the judges to disregard what they had learned but instead asked them only what they would have predicted. Nevertheless, the questions are formally identical—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.<sup>111</sup> For example, studies have found that asking (as we did) “what you would have predicted” 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.”<sup>112</sup> Furthermore, our findings are consistent with others showing that judges commit the hindsight bias.<sup>113</sup>

Finally, our conclusion that judges commit the hindsight bias 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.<sup>114</sup> This court reasoned that, “it was common knowledge, not only among 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.”<sup>115</sup> 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 “red flags” suggesting poor performance and for selling securities at the “bottom of the market.”<sup>116</sup> How the trustees in such cases were supposed to have known that the red flags were more predictive than the positive signals or that a stock price had actually reached bottom is unclear. The defendants in such cases were victims of the hindsight bias.

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<sup>111</sup> *See id.* at 314-16.

<sup>112</sup> Fischhoff, *supra* note 95, at 293-97.

<sup>113</sup> Anderson et al., *supra* note 18; Viscusi, *supra* note 20; Jennings et al., *supra* note 20.

<sup>114</sup> *In re Chamberlain*, 9 N.J. Misc. 809 (1931).

<sup>115</sup> *Id.* at 810.

<sup>116</sup> *Chase v. Peaver*, 419 N.E. 2d 1358, 1368 (1981) (“red flags”); *First Alabama Bank v. Martin*, 425 So. 2d 415, 428 (1983) (“bottom of the market”).

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When predicting the likelihood of something after the fact, judges cannot help but rely on facts that was not available before the fact. Judges' susceptibility to the hindsight bias is troubling because judges are frequently expected to suppress their knowledge of some set of facts before making decisions. When ruling on the legality of a police search, for example, judges are expected to suppress their knowledge of the outcome of the search. When assessing the reasonableness of precautions taken by a tort defendant, judges are expected to disregard their knowledge of the ensuing injury. Although we did not test the operation of the hindsight bias on these issues, 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., defendant's demeanor) is representative of the category.<sup>117</sup> When the

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<sup>117</sup> Professors Kahneman and Tversky described the representativeness heuristic in a series of articles. See Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COG. PSYCHOL. 430, 430 (1972) (first defining the "representativeness heuristic") [hereinafter, *Subjective Probability*]; Daniel Kahneman & Amos Tversky, *On the Psychology of Prediction*, 80 PSYCHOL. REV. 237 (1973) (expanding upon their earlier treatment of the representativeness heuristic) [hereinafter Kahneman & Tversky, *Prediction*]; Amos Tversky &

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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); Amos Tversky & Daniel Kahneman, *Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment*, 90 PSYCHOL. REV. 293 (1983) (exploring the “conjunction fallacy,” a manifestation of the representativeness heuristic) [hereinafter Tversky & Kahneman, *Conjunction Fallacy*]; Tversky & Kahneman, *supra* note 8, at 1124-27 (explaining various decision errors caused by the representativeness heuristic); Amos Tversky & Daniel Kahneman, *Judgments of and by Representativeness*, in JUDGMENT UNDER UNCERTAINTY:

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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.”<sup>118</sup>

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HEURISTICS AND BIASES 84 (Daniel Kahneman, Paul Slovic & Amos Tversky eds., 1982) (synthesizing their prior work on representativeness) [hereinafter Tversky & Kahneman, *Representativeness*].

<sup>118</sup> Kahneman & Tversky, *Subjective Probability*, *supra* note 120, at 431 (conceding that representativeness “is easier to assess than to characterize” as “no general definition [of it] is available.”) *See also*, PLOUS, *supra* note 8, at 110 (noting that his definition of representativeness is “abstract and a little hard to understand”).

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Although the representativeness heuristic can be useful, it leads people to discount other information relevant to determining the likelihood that the evidence is actually a product of a particular category. In particular, people undervalue the importance of the frequency with which the underlying category occurs, which is known as the “base-rate” statistics.<sup>119</sup> 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 ] . . . dull and mechanical [fashion] . . . [, and] seems to have little sympathy for

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<sup>119</sup> Kahneman & Tversky, *Prediction*, *supra* note 120, at 238 (“In many situations, representative outcomes are indeed more likely than others. This is not always the case, however, 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.”)

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other people” is more likely to be a graduate student in computer science or in humanities and education. 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.<sup>120</sup> Even though such background or base-rate information is obviously highly relevant, people routinely ignore it, or at least discount it, when making categorical judgments.<sup>121</sup>

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<sup>120</sup> Kahneman & Tversky, *Prediction*, *supra* note 120, at 238-39.

<sup>121</sup> *But see* Jonathan J. Koehler, *The Base Rate Fallacy Reconsidered: Descriptive, Normative, and Methodological Challenges*, 19 *BEHAVIORAL & BRAIN SCI.* 1 (1996) (arguing that the proponents of the representativeness heuristic have overstated the extent to which people actually neglect base rates).

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Why people ignore base rates and rely on the representativeness heuristic when making categorical judgments is unclear. Individuating evidence is more salient and vivid, and hence more compelling than pallid base-rate statistics.<sup>122</sup> Also, as relevant statistical evidence is commonly unavailable, it might simply be more efficient for people to focus on individuating evidence.<sup>123</sup> What is clear, however, is that excess reliance on the representativeness heuristic leads people to commit a variety of decision-making errors.<sup>124</sup> In legal decision making, for example, the failure to attend to base rates can induce a troublesome problem known as the “inverse fallacy.”<sup>125</sup> 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).<sup>126</sup>

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<sup>122</sup> 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).

<sup>123</sup> See Gerd Gigerenzer & Daniel G. Goldstein, *Reasoning the Fast and Frugal Way: Models of Bounded Rationality*, 103 PSYCHOL. REV. 650 (1996).

<sup>124</sup> See 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 in supporting the representativeness heuristic. See, e.g., Leda Cosmides & John Tooby, *Are Humans Good Intuitive Statisticians After All? Rethinking Some Conclusions From the Literature on Judgment Under Uncertainty*, 58 COGNITION 1 (1996) (arguing that people use a “frequentist” rather than a “Bayesian” approach to probability analysis); Koehler, *supra* note 124 (arguing that Tversky and Kahneman have overstated the extent to which people actually neglect base rates); Peter R. Mueser et al., *A Generalized Signal Detection Model to Predict Rational Variation in Base Rate Use*, 69 COGNITION 267 (1999) (arguing that a normative model with less restrictive assumptions better explains how people make probabilistic judgments than does the representativeness account).

<sup>125</sup> 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).

<sup>126</sup> See, e.g., *id.* at 432 (“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 LR [likelihood ratio] is identical to the denominator of the posterior odds ratio.”)

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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 states 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, as the probability that the defendant is innocent depends also on the size of the population that the suspect's DNA was drawn from and the reliability of the DNA test.<sup>127</sup> 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.<sup>128</sup>

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<sup>127</sup> *Id.*

<sup>128</sup> 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).

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As trained legal professionals, judges might have an advantage over other experts in such reasoning tasks. One prior study indicated that graduate training in law reduces the likelihood that a person will commit the inverse fallacy.<sup>129</sup> Nevertheless, other professionals who should be adept at such tasks, such as doctors, have been shown to commit the fallacy in overwhelming numbers.<sup>130</sup>

### 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*.<sup>131</sup>

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

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<sup>129</sup> Lehman et al., *supra* note 25, at 440.

<sup>130</sup> William Cascells et al., *Interpretations by Physicians of Clinical Laboratory Results*, 299 NEW ENGLAND J. MED. 999, 999-1000 (1978).

<sup>131</sup> *Byrne v. Boadle*, 2 H. & C. 722, 159 Eng. Rep. 299 (1863).

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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 quite high.<sup>132</sup> (Indeed, the inverse fallacy might account for a logical flaw in the doctrine of *res ipsa loquitur* first noted by Professor Kaye, which we describe below.<sup>133</sup>) In fact, however, the actual probability that the defendant 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 a victim would be injured by the defendant’s negligence

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<sup>132</sup> 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).

<sup>133</sup> Professor Kaye identified the logical problems with the *res ipsa loquitur* doctrine more than 20 years ago. David Kaye, *Probability Theory Meets Res Ipsa Loquitur*, 77 MICH. L. REV. 1456 (1979). See RESTATEMENT (SECOND) OF TORTS § 328D(1) (“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 eliminated by the evidence; and © the indicated negligence is within the scope of the defendant’s duty to the plaintiff.”). Drafts of the Third Restatement of Torts correct this error. RESTATEMENT (THIRD) OF TORTS (Council Draft No. 1, Sept. 25, 1998) § 15.

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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 is 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 is .090% divided by 1.089%, or 8.3%.

### 2. Representativeness Heuristic: Results

Of the 159 judges who responded to the question (eight judges, or 4.8%, did not respond), 40.9% (65 out of 159) selected the right answer by choosing 0-25%; 8.8% (14 out of 159) indicated 26-50%; 10.1% (sixteen out of 159) indicated 51-75%; and 40.3% (64 out of 159) indicated 76-100%. The judges did well, overall, with more than 40% of them getting 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.<sup>134</sup>

Although we did not inquire into the reasoning process that led these judges to their answers, the number of judges who chose the high end suggests that many committed the inverse fallacy.

In fact, roughly as many judges got the right answer as gave the answer that the inverse fallacy suggests.

### 3. Representativeness Heuristic: Discussion

When presented with problems like this one, the vast majority of expert decision makers typically over-rely on the representativeness heuristic and commits the inverse fallacy.<sup>135</sup>

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, 40% of the judges appeared to rely on the representativeness heuristic and answered the question incorrectly.

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<sup>134</sup>  $\chi^2(2) = 53.24, p < .001$ . The statistic tests against the null hypothesis that the distribution of incorrect responses was random.

<sup>135</sup> See Eddy, *supra* note 135, at 253-54.

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Thus, although the judges in our sample did better than other groups that have been studied, nearly half of the judges fell into the trap that the representativeness heuristic creates.

Over-reliance 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).<sup>136</sup> Case law is replete with expressions of this preference. In one famous case, for example, a plaintiff allegedly injured in a bus accident sought to rely on statistical evidence that the defendant owned the bus that injured her because the plaintiff could not identify the type of bus that caused her injury.<sup>137</sup> Despite the evidentiary value of the plaintiff's base-rate evidence, the Supreme Judicial Court of Massachusetts refused to allow a plaintiff to rely solely on it to prove that the defendant's bus was responsible for her injuries. Although other valid policy reasons might also support this preference,<sup>138</sup> 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 theory. As the *Restatement (Second) of Torts* articulates it, a jury can infer that the defendant is negligent from the occurrence of an event that is "of a kind that ordinarily does not occur in the absence of negligence."<sup>139</sup> Such an inference owes its superficial appeal to the representativeness heuristic.<sup>140</sup> Even if an event does not ordinarily occur when negligence is not present, 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, in the absence of

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<sup>136</sup> See Amos Tversky & Daniel Kahneman, *Evidential Impact of Base Rates*, in *JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* 153, 156-58 (Daniel Kahneman, Amos Tversky & Paul Slovic eds., 1982).

<sup>137</sup> *Smith v. Rapid Transit, Inc.*, 317 Mass. 469, 58 N.E.2d 754 (1945).

<sup>138</sup> See Charles Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357, 1368-77 (1985); Lawrence H. Tribe, *Trial by Mathematics, Precision & Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1344-50 (1971). *But see* Jonathan J. Koehler & Daniel N. Shavero, *Veridical Verdicts: Increasing Accuracy Through the Use of Overtly Probabilistic Evidence and Methods*, 75 CORNELL L. REV. 247, 255-56 (1990) (arguing for greater reliance on statistical evidence in the courts).

<sup>139</sup> RESTATEMENT (SECOND) OF TORTS § 328 (1965).

<sup>140</sup> See Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation*, 79 OR. L. REV. – (forthcoming 2000).

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negligence, the accident was unlikely to occur. 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,<sup>141</sup> 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**

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<sup>141</sup> RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 3 (1995); RESTATEMENT (THIRD) OF TORTS (Council Draft No. 1, Sept. 25, 1998) § 15.

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People tend to make judgments about themselves and their abilities that are “egocentric” or “self-serving”.<sup>142</sup> People routinely estimate, for example, that they are above average on a variety of desirable characteristics, including health,<sup>143</sup> driving,<sup>144</sup> productivity,<sup>145</sup> and the likelihood that their marriage will succeed.<sup>146</sup> Moreover, people overestimate their contribution to joint activities. Following a conversation, for example, both parties will estimate

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<sup>142</sup> 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).

<sup>143</sup> See Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCHOL. 806, 809-11 (1980).

<sup>144</sup> See Ola Svenson, *Are We All Less Risky and More Skillful Than Our Fellow Drivers?* 47 ACTA PSYCHOLOGICA 143, 145-46 (1981).

<sup>145</sup> See Patricia K. Cross, *Not Can, But Will College Teaching Be Improved?* 17 NEW DIRECTIONS FOR HIGHER EDUCATION 1, 5-6 (Spring 1977).

<sup>146</sup> 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 (1993) (recently married couples almost unanimously expect that they will not get divorced, despite knowing that the divorce rate is 50%).

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that they spoke more than half the time.<sup>147</sup> Similarly, when married couples are asked to estimate the percentage of household tasks they perform, their estimates typically add up to far more than 100%.<sup>148</sup>

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<sup>147</sup> See Ross & Sicoly, *supra* note 145, at 324.

<sup>148</sup> *Id.* at 325-26.

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Egocentric biases occur for several reasons. First, of course, is self-presentation. People may not really believe that they are better than average, but they will tell researchers that they are.<sup>149</sup> Second, people engage in confirmatory mental searches for evidence that supports a theory they want to believe, such as that their marriage will succeed.<sup>150</sup> They have no comparable data on the success of strangers' marriages, so the only evidence they find suggests that theirs is more likely than others' to be successful.<sup>151</sup> Third, memory is egocentric

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<sup>149</sup> See SUSAN T. FISKE & SHELLEY E. TAYLOR, *SOCIAL COGNITION* 78-82 (1991) (describing theories that account for egocentric biases).

<sup>150</sup> *Id.*

<sup>151</sup> See Baker & Emery, *supra* note 149, at 446-48.

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in that people remember their own actions better than others.<sup>152</sup> Thus, when asked to recall the percentage of housework they perform, they remember their own contribution more easily, leading them to overestimate it.<sup>153</sup> Finally, many of the constructs involved in egocentric biases are ambiguous, and thus, people can define success differently.<sup>154</sup> 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.<sup>155</sup>

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<sup>152</sup> See FISKE & TAYLOR, *supra* note 152, at 78-82.

<sup>153</sup> See Ross & Sicoly, *supra* note 145, at 324.

<sup>154</sup> See FISKE & TAYLOR, *supra* note 152, at 78-82.

<sup>155</sup> See Svenson, *supra* note 147, at 145-46.

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Egocentric biases can be adaptive, but they can also have an unfortunate influence on the litigation process.<sup>156</sup> Due to egocentric biases, litigants and their lawyers might overestimate their own abilities, the quality of their advocacy, and the relative merits of their cases.<sup>157</sup> These views, in turn, are likely to undermine settlement efforts. In one study, for example, Professor Loewenstein and his colleagues asked law students to assess the value of a tort case in which the plaintiff had sued defendant for \$100,000 in damages arising from an automobile-motorcycle collision.<sup>158</sup> 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. 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. When asked to identify what they perceived to be a fair settlement value for the case, plaintiff-participants selected a value \$17,709 higher than the value selected by defendant-participants.<sup>159</sup> As suggested by these results, 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 fail to identify untoward influences on their own decision-making processes.

### 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

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<sup>156</sup> See, e.g., Linda Babcock & George Loewenstein, *Explaining Bargaining Impasse: The Role of Self-Serving Biases*, 11 J. ECON. PERSP. 109, 110-11 (1997); Linda Babcock & Gregory Pogarsky, *Damage Caps Cast a Long Shadow: An Experimental Investigation of Their Impact on Expectations and Settlements*, 28 J. LEGAL STUD. 341 (1999); George Loewenstein et al., *Self-Serving Assessments of Fairness and Pretrial Bargaining*, 22 J. LEGAL STUD. 135 (1993).

<sup>157</sup> See, e.g., Babcock & Loewenstein, *supra* note 159, at 119 (noting that egocentric biases are likely to be “an important determinant of bargaining impasse”); Babcock & Pogarsky, *supra* note 159, at 352-53 (noting that there is “abundant empirical evidence that individuals consistently exhibit ‘self-serving biases’ during negotiations”).

<sup>158</sup> Loewenstein et al., *supra* note 159, at 145-49.

<sup>159</sup> *Id.* at 150-51.

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 (>25%), or lowest (lowest 25%). The materials explained the meaning of each quartile in careful detail.<sup>160</sup>

## 2. Egocentric Biases: Results

The judges exhibited an egocentric bias. Overall, 56.1% (87 out of 155) of the judges reported that their appeal rate placed them in the lowest quartile; 31.6% (49 out of 155) placed themselves in the second-lowest quartile; 7.7% (12 out of 155) in the second-highest quartile, and 4.5% (7 out of 155) in the highest quartile.<sup>161</sup> In other words, nearly 90% 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.<sup>162</sup>

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<sup>160</sup> For example, next to the line “In the highest quartile”, the materials added “(meaning the rate at which you have been overturned is higher than that of 75% of the magistrate judges in this room).”

<sup>161</sup> Twelve judges out of 167 (7.2%) declined to respond to this question.

<sup>162</sup>  $\chi^2(3) = 107.3, p < .001$ . The statistic tests the null hypothesis that 25% of the responses would fall into each of the four quartiles (which would be normatively correct).

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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 as much. 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.<sup>163</sup>

### 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 judges truly believed their egocentric answers or were simply unwilling to admit that they had high reversal rates. Given that the judges knew 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, people genuinely believe that they are “better than average” at a variety of endeavors.<sup>164</sup> Also, our results are similar to those found in a study of bankruptcy judges by Professor Eisenberg.<sup>165</sup> His 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.<sup>166</sup> Also, the bankruptcy judges in Eisenberg’s study believed that

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<sup>163</sup>  $\chi^2(2) = 46.4, p < .001$ . The statistic test the null hypothesis that the responses would fall equally into each of the three quartiles other than the highest (which would be normatively correct).

<sup>164</sup> See FISKE & TAYLOR, *supra* note 152, at 78-79.

<sup>165</sup> Eisenberg, *supra* note 20.

<sup>166</sup> *Id.* at 983.

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the lawyers who appear in front of them feel much more fairly treated than is actually the case.<sup>167</sup>

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<sup>167</sup> *Id.* at 986.

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Egocentric biases might keep judges from maintaining an awareness of their limitations, which 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.”<sup>168</sup> 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 appeal from a Federal District Court’s denial of any constitutional civil rights claims must first seek a certificate of appealability from the same court that denied the claim.<sup>169</sup> 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.”<sup>170</sup> The influence of the egocentric bias likely makes it difficult for a litigant to convince a federal judge that she or he 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;<sup>171</sup> even if a jury made the actual decision, egocentric biases might lead the judge presiding over the case to react with some indignity to the suggestion that his or her courtroom produced an erroneous result. More generally, egocentric biases may make it hard for judges to realize that they can: make mistakes; issue unfair, biased rulings; make choices that reflect personal biases; or even be subject to cognitive illusions of judgment.

At the same time, egocentric biases can be beneficial. Psychologists argue that having a somewhat inflated belief in one’s abilities maintains one’s morale and keeps a healthy sense

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<sup>168</sup> 28 U.S.C. § 1292(b).

<sup>169</sup> 28 U.S.C. § 2253.

<sup>170</sup> *Slack v. McDaniel*, 120 S.Ct. 1595, 1603-04 (2000).

<sup>171</sup> In civil cases, such requests can be made under Fed. R. Civ. Pro. 59 & Fed. R. Civ. Pro. 60; in criminal cases, collateral attacks on the verdict can be brought under 28 U.S.C. § 2255.

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of well-being.<sup>172</sup> Also, society surely prefers its judges to be resolute and self-assured rather than timid and insecure. Egocentric beliefs may induce judges to see the world in self-serving fashion, but the legal system may be better off because of it.

### F. Cognitive Illusions in Judges and Other Decision Makers

Our study demonstrates 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 judicial decision making as much as the decision making of others? Table 4 compares our results to results of studies on other, non-judicial decision makers:

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<sup>172</sup> See Shelley E. Taylor & John Brown, *Illusions and Well-Being: A Social Psychological Perspective on Mental Health*, 103 PSYCHOL. BULL. 193 (1988).

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**Table 4: Summary of Effect Sizes in Our Study as Compared to Other Decision Makers**

<i>Cognitive Illusion</i>				<i>Compared to Others</i>
	<i>Our Test for the Illusion</i>	<i>Normative Expectation</i>	<i>Size of the Effect</i>	
Anchoring Effects	Estimated damages w/ & w/out 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 percent 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	Choosing 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

Table 4 shows that judges in our study appear 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 effects 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

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difficult to make, as 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, whereas 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.<sup>173</sup> Although the percent reduction in mean awards in that study exceeded the one we found in 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 losses-frame condition. The judges in our study were 15 percentage points more inclined to say that plaintiff rather than defendant should settle, while other studies using student subjects have found 14 to 51 percentage-point differences between subjects in the two conditions.<sup>174</sup> In the prior study most similar to ours, Rachlinski gave law student subjects a hypothetical copyright scenario and found a 46 percentage-point difference in settlement rates between plaintiff and defendant subjects, 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 previous studies indicating that experienced lawyers are less susceptible to the influence of framing.<sup>175</sup>

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<sup>173</sup> Malouff & Schutte, *supra* note 14, at 495.

<sup>174</sup> See Korobkin & Guthrie, *supra* note 78, at 128-42; Rachlinski, *supra* note 76, at 135-44.

<sup>175</sup> Korobkin & Guthrie, *A New Look*, *supra* note 25, at 95-101.

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The judges in our study exhibited just as much hindsight bias as has been observed in studies of mock jurors and others. Our materials were somewhat different than most studies of the hindsight bias because in that we asked the judges to make a choice 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 the hindsight bias alters the decisions of 27% of the subjects.<sup>176</sup> This approximates our estimate that 24% of the judges in our study made a different choice because of the hindsight bias.<sup>177</sup> Our result is also within the range of shifts observed in previous mock-jury studies of the hindsight bias.<sup>178</sup> 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.<sup>179</sup>

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 provide a specific probability estimate. Nevertheless, in a comparable study, only one in five doctors--as compared to 40% of the judges in our study--provided what we would have deemed the correct answer to a problem like ours.<sup>180</sup>

Finally, the judges in our study exhibited egocentric biases comparable to those exhibited by subjects in other studies of the effect.<sup>181</sup> 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

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<sup>176</sup> Christensen-Szalanski & Williams, *supra* note 107, at 161.

<sup>177</sup> 172% minus 100% divided by 3 conditions.

<sup>178</sup> Three mock-jury studies used binary decisions: Hastie et al., *supra* note 12, at 606 (24% shift); Kamin & Rachlinski *supra* note 12, at 98 (34% shift); Stallard & Worthington, *supra* note 12, at 679 (28% shift).

<sup>179</sup> Anderson, *supra* note 20; Viscusi, *supra* note 20, at 46-55; Jennings, *supra* note 20. Professor Viscusi found that judges were somewhat less susceptible to the hindsight bias, but we suspect that his study's sample of judges (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 (but did not eliminate) the effect.

<sup>180</sup> Cascells et al., *supra* note 133, at 1000.

<sup>181</sup> Svenson, *supra* note 147, at 145-46.

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only slightly more modest than university faculty--94% of whom rate themselves as better than their average peers.<sup>182</sup>

In sum, the judges in our study were less susceptible to framing effects and relied less on the representative heuristic than other decision makers faced with similar situations, but they proved to be just as susceptible as other experts and laypersons to the influence of anchoring effects, the hindsight bias, and the egocentric bias.

### **G. Do These Findings Apply To Judges in the Courtroom?**

The decisions that judges made in response to our materials differ from the decisions that they make in their courtrooms in three important ways. In the courtroom, judges must make more detailed and complicated decisions, are more highly motivated to make accurate judgments, and have more time and resources to devote to making a decision. These differences suggest we should be cautious in interpreting our results. Our study shows that judges rely on cognitive processes that are likely to induce them to make systematic errors, but they do not test whether judges actually make such errors in the courtroom.

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<sup>182</sup> Cross, *supra* note 148, at 10.

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Nevertheless, it is likely that the results of our study apply to decisions in the real world. In the study, we employed standard research methods of cognitive psychology, which have proven enormously successful in identifying decision making strategies that people use in real decisions.<sup>183</sup> 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 infer how people think based on their responses under these conditions.<sup>184</sup> These methods frequently demonstrate that people make predictable errors, thereby reflecting an underlying logic to their thought processes.

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<sup>183</sup> See Daniel Kahneman & Amos Tversky, *On the Reality of Cognitive Illusions*, 103 PSYCHOL. REV. 582, 582 (1996). Some have criticized these methods. See, e.g., Cosmides & Tooby, *supra* note 127 (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).

<sup>184</sup> See Kahneman & Tversky, *supra* note 182, at 582 (1996) (explaining methods of cognitive psychologists).

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To the extent that the methods used in this study have identified thought processes that judges use, the conclusions apply to the real world. After all, increased motivation and incentives “do not work by magic: they work by focusing attention and by prolonging deliberation.”<sup>185</sup> 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.

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<sup>185</sup> See Tversky & Kahneman, *Rational Choice*, *supra* note 70, at S274.

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Similarly, the greater detail that judges face in actual cases, by itself, does not 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 biases, including the hindsight bias, which grow *more* powerful as materials become more detailed.<sup>186</sup>

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. They will still rely on cognitive shortcuts. If judges are unaware of the cognitive illusions that reliance on heuristics produce, 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 biases will persist in the face of high motivation and great detail are the results of those studies showing cognitive biases in the real world. In one striking example, researchers demonstrated that framing effects persist even when the stakes consist of two months salary among poor people.<sup>187</sup> Considering the motivation that a decision maker faces to make a good choice involving such a significant

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<sup>186</sup> Rachlinski, *supra* note 98, at 567.

<sup>187</sup> Steven J. Kachelmeier & Mohamed Shetata, *Examining Risk Preferences Under High Monetary Incentives: Experimental Evidence from the People's Republic of China*, 82 AM. ECON. REV. 1120 (1992).

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portion of their wealth, and all of the complex details of one's life that would feed into such a choice, one would expect that if framing effects are found in such a decision, they must be widespread. Furthermore, several studies show that framing effects and egocentric biases influence decisions made in the real world when the stakes are high; for example, framing effects and egocentric biases influence lawyers' assessments of actual lawsuits.<sup>188</sup> Similarly, numerous case studies reveal the influence of the hindsight bias on expert evaluations of the causes of accidents.<sup>189</sup> In short, "the corrective power of incentives depends on the nature of the particular error and cannot be taken for granted."<sup>190</sup>

Most importantly, published judicial opinions include numerous examples of the influence of cognitive illusions. As noted above, the judge-made *res ipsa loquitur* doctrine appears to be a product of over-reliance on the representativeness heuristic. The judges in cases such as *Byrn v. Boadle* surely were motivated to get the right answer and surely faced an intricate record. Nevertheless, these judges, along with generations of other judges in a

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<sup>188</sup> Rachlinski, *supra* note 76, at 154 (showing that framing effects influence real settlement negotiations); Marjike Malsch, *Lawyers' Predictions of Judicial Decisions: A Study on Calibration of Experts* (Unpublished Dissertation on file with Authors) (lawyers in actual cases are over-confident of their ability to predict judges' decisions).

<sup>189</sup> Fischhoff, *supra* note 92, at 339-42.

<sup>190</sup> Kahneman & Tversky, *Rational Choice*, *supra* note 70, at S274.

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multitude of other cases involving *res ipsa loquitur* and the American Law Institute cemented this error into the common law for over a century.

Similarly, also as noted above, numerous courts have fallen prey to the hindsight bias. In *Smith v. VanGorkum*,<sup>191</sup> for example, the Delaware Supreme Court held a corporate board liable for a decision that turned out badly, even though commentators have concluded that the board could not have foreseen the adverse outcome.<sup>192</sup> In the case, the Delaware Supreme Court assumed that the board could have foreseen the adverse outcome that it supported, without even pausing to consider the possibility that its judgment was influenced by its knowledge of the outcome. No court is more experienced with corporate matters or has greater motivation to reach a good decision in a corporate case as the Delaware Supreme Court, and yet they too, were taken in by the hindsight bias.

In these examples, judges bringing all of their resources and expertise to bear on complicated matters fell prey to basic cognitive illusions of judgment. They also did so in a profoundly public ways--in published judicial opinions. Thus, it would seem that greater motivation, detail, and resources do not necessarily enable judges 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'

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<sup>191</sup> *Smith v. VanGorkum*, 488 A.2d 858 (Del. 1985).

<sup>192</sup> See E. Norman Veasey & Julie M. S. Seitz, *The Business Judgment Rule in the Revised Model Act, The Trans Union Case, and the ALI Project: A Strange Porridge*, 63 TEXAS L. REV. 1483, 1499 (1985); Rachlinski, *supra* note 143. The Delaware Legislature effectively overruled the court's major holding shortly after the court handed down the decision.

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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 mirrored the predictions offered by the psychological research on judgment and decision making. In the course of making decisions in real cases, these judges certainly face more complex fact patterns, are more motivated to make better decisions, have more time to make decisions, and have assistance from litigants, lawyers, and clerks. But unless these factors alter the fundamental way judges think, they will not eliminate the effects of cognitive illusions.

### III. GENERAL DISCUSSION AND IMPLICATIONS

Judges, it seems, are human.<sup>193</sup> 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 they can try to avoid the errors that illusions tend to produce. Second, the legal system might consider re-allocating decision-making power from judges to juries as a means of reducing the effects of cognitive illusions. Third, judges and legislators might attempt to craft legal rules that minimize the effect cognitive illusions can have on judgment.

#### a. Improving Judicial Judgment

The heuristics that create cognitive illusions are deeply ingrained and often useful decision aids, so it would be difficult for judges to refrain from using them. Nevertheless, judges can (and we argue, 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 decisions that are likely to be the product of cognitive illusions.

#### 1. Adopting Multiple Perspectives

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<sup>193</sup> Jerome Frank, *Are Judges Human?* 80 U. PA. L. REV. 17 (1931).

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Judges may be able to reduce the effect of some cognitive illusions by developing the habit of approaching decisions from multiple perspectives. For example, the undesirable consequences of framing, which generally consist of making choices that are too risky in the face of losses, can be overcome by recognizing that decisions can often be characterized either as gains or as losses.<sup>194</sup> 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), which could be avoided by sacrificing a \$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.<sup>195</sup> Alternatively, the defendant could recognize that it would still realize \$60,000 in revenue on its use of the contested piece of intellectual property if it accepted the settlement. Considering a decision problem from different perspectives does not eliminate the effects of decision frames, but it can reveal to the decision makers the arbitrary nature of the frame's influence.

In their role as case managers or settlement brokers, judges are in a unique position to re-frame settlement decisions for the parties, as they have no stake in the outcome. Indeed, one possible reason that the 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 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, thereby making 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.<sup>196</sup> As they gain experience with settlement, many judges surely learn that re-characterizing decision options can convince a

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<sup>194</sup> See Kahneman & Tversky, *Choices, Values, and Frames*, *supra* note 70, at 342-44; Kahneman & Tversky, *Prospect Theory*, *supra* note 70, at 268-69; Tversky & Kahneman, *Framing of Decisions*, *supra* note 70, at 453-55; Tversky & Kahneman, *Rational Choice*, *supra* note 70, at S257. 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.

<sup>195</sup> 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 (1991) (advising people to always consider their best alternative to a negotiated settlement before entering into negotiations).

<sup>196</sup> Rachlinski, *supra* note 76, at 154-59 (the risk-seeking tendencies that the loss frame produces leads defendants to undertake risky litigation strategies).

litigant to abandon a destructive litigation strategy. Thus, such techniques would also be a valuable part of a training program

## 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 of the information presented, judges can exercise some say control over the anchors they use. Judges should be wary of simply relying on anchors supplied by litigants, such as a plaintiff's lawyer's damage requests, or other anchors unconnected to the true value of the case, such as statutory damage caps. Instead, judges should use more reliable numerical reference points, such as 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 not having reliable numerical anchors available. Many judges asserted that they could not answer without knowing the plaintiff's age and occupation—which could be used as rough, but unbiased, proxies for a damage award. 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 identify the exact effect of the one anchor that we did provide. The judge in an actual case usually will be provided, or should have the ability to obtain, several useful anchors.

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. In our materials, negligence was known to be extremely unusual and hence the mere fact of an accident could not support the conclusion of negligence. a rare event (such as the accident) is more likely to be the extraordinary product of a common event (non-negligence) than the ordinary product of an extraordinary event (negligence). Rare events should not be attributed to extraordinary causes without powerful evidence.<sup>197</sup>

The fact that the judges in our study performed better than other experts on the “rare event” problem suggests that their experience may have curbed undue reliance on the representativeness heuristic. Although scholars frequently criticize judges for failing to evaluate statistical evidence properly,<sup>198</sup> judges have a wealth of experience evaluating the probative value

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<sup>197</sup> 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, 45 (1996).

<sup>198</sup> *Id.*

of evidence. This experience may have led the judges in our study to distrust their intuitive reliance on the similarity between the evidence and the hypothesis it allegedly supports. We doubt, for example, that judges are as impressed by potentially misleading evidence, such as the apparent nervousness of a criminal defendant, as juries, having seen countless nervous defendants in their courtroom. Just as appropriate evidence evaluation can be learned, it can also be taught to new judges.

### 3. Reducing Reliance on Tainted Judgments

Finally, judges can avoid relying on those kinds of judgments that are especially prone to the influence of cognitive illusions. Among the five biases we tested, two are essentially impossible to mitigate: egocentric biases and the hindsight bias. Egocentric beliefs are closely connected to good mental health, especially for abilities that are important to one's personal or professional life.<sup>199</sup> Inflated beliefs in one's personal and professional abilities allows 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.<sup>200</sup> 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 faith in their abilities. In those 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 prisoner's rights case), judges should proceed with caution and search for independent sources of judgment, if possible.<sup>201</sup> For example, local rules could allow judges to assign a request for certification

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<sup>199</sup> See SHELLEY E. TAYLOR, *POSITIVE ILLUSIONS: CREATIVE SELF-DECEPTION AND THE HEALTHY MIND* (1989)

<sup>200</sup> *Id.*, at 214 (“mildly depressed people actually have a somewhat more accurate view of reality, at least about certain things, than do people who are not depressed.”)

<sup>201</sup> 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).

of appealability to a different judge, even though this would be significantly less efficient than allowing the same judge to manage the whole case. As discussed below, the law provides other such safeguards.

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;<sup>202</sup> neither does "trying hard" to avoid its effects.<sup>203</sup> The judges in our study revealed a strong hindsight bias. Previous research suggests that correcting for the bias is not feasible.<sup>204</sup>

When confronted with judgments likely to be affected by the hindsight bias, judges should distrust their own 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 non-conformity 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 promote such judgments are also possible 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 part of the time. Similarly, the full-time managerial judges should become more adept at avoiding framing effects than judges who occasionally supervise settlements. Greater experience, 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 avoiding the influence of cognitive errors in the courtroom.<sup>205</sup> Recent

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<sup>202</sup> See Rachlinski, *supra* note 98, at 586-88 (reviewing studies on ways to reduce the influence of the hindsight bias).

<sup>203</sup> *Id.*

<sup>204</sup> Rachlinski, *supra* note XX, at XX (Chicago article--debiasing section).

<sup>205</sup> See, e.g., Posner, *supra* note 105, at 1501; Sunstein et al., *supra* note 15, at 2127; Viscusi, *supra* note 20, at 60.

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years, in fact, have witnessed increasing distrust of juries by judges, who have made efforts to curb juries' authority.<sup>206</sup> Although previous research has shown that cognitive illusions influence juries, the results of our study suggest that judges themselves are vulnerable to cognitive illusions.<sup>207</sup>

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 is likely to blunt the effects of cognitive illusions. For example, even though our results suggest that judges rely on anchoring as much as juries do, judges might be able to avoid some of the unwanted effects of anchoring because they will be aware of awards in comparable cases that they can use as a source of more reasonable anchors than the anchor the plaintiff's attorney is likely to provide. Anchors from similar cases might be somewhat inaccurate, but at least they provide a potentially unbiased influence on the judge's award. By contrast, jurors are less likely to have this information at their disposal and are more likely to be influenced by partisan anchors, such as those arising due to damage requests made by plaintiff's attorneys.

Additionally, judges are in a better position to determine whether evidence is relevant. Relevance is largely a statistical concept that can be misunderstood. Judges are less likely than jurors to rely on heuristics like representativeness that can lead to erroneous evidentiary

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<sup>206</sup> Mark Currdan, *Putting the Squeeze on Juries*, A.B.A. J. 53 (August 2000).

<sup>207</sup> Professors Calvin 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. HARRY KALVIN JR. & HANS ZEISEL, *THE AMERICAN JURY* 104-21 (1966). Calvin and Zeisel found that disparate assessments of evidence produced most of the judge-jury disagreements. *Id.* at 115.

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determinations. For instance, suppose 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 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. Judges with experience ruling on such evidentiary matters are less likely to make the mistake of admitting such evidence, but jurors encountering such information for the first time are likely to perceive the evidence as relevant due to over-reliance on the representativeness heuristic.

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 can have over judges. Juries consist of groups, and group deliberation might reduce some illusions of judgment.<sup>208</sup> 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.<sup>209</sup> Because groups are more likely to remember all of the relevant facts than individuals, group decision making is more likely to mitigate some of the hindsight bias' influence, suggesting that juries might better avoid the hindsight bias than judges.

Another important advantage that juries may have over judges is that judges can keep information likely to induce cognitive illusions (such as evidence of a subsequent remedial measure or a statutory damage cap) from juries, but not from the judges themselves. Generally, when the only means of avoiding the effect of a cognitive illusion is to restrict access to that information, a jury has real advantages over a judge.

On balance, then, our results suggest that those clamoring for judges to replace juries should proceed with some 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 may enable juries to make better decisions than judges in other circumstances.

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<sup>208</sup> 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 Cass R. Sunstein, *The Law of Group Polarization* (unpublished manuscript on file with authors).

<sup>209</sup> Hawkins & Hastie, *supra* note 96, at 321.

**C. Legal Rules that Avoid Illusions of Judgment**

The legal system might also adopt procedural, evidentiary, and even substantive rules to avoid the deleterious effects of cognitive illusions on judicial decision making. By adopting such rules, we can avoid placing judges in the 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 effect of these illusions of judgment.<sup>210</sup>

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<sup>210</sup> See generally, Rachlinski, *supra* note 143 (discuss adaptations in the legal system to cognitive illusions).

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Several legal rules, for example, represent adaptations to the effects of the hindsight bias. Rule 407 of the Federal Rules of Evidence is one example.<sup>211</sup> 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.<sup>212</sup> In medical malpractice cases, for instance, courts are tasked not to make *ex post* determinations about whether the defendant behaved “reasonably” but rather are charged with inquiring into whether the defendant behaved in a manner consistent with customary practices established *ex ante* by the medical profession.<sup>213</sup> In corporate law, courts refuse to hold officers and directors of corporations liable for negligent business decisions because such decisions, though wise in foresight, can seem foolish in hindsight.<sup>214</sup>

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, and thus perhaps 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 assign severe penalties (including death) or extremely high damage

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<sup>211</sup> Fed. R. Evid. 407.

<sup>212</sup> See Rachlinski, *supra* note 98, at 608-13.

<sup>213</sup> *Id.* at 612.

<sup>214</sup> See *Id.* at 621.

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awards, 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 such review reflects, at the very last, a recognition that the trial process can make mistakes, even 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 over-confident civil verdicts. Obviously political beliefs support both the availability of multiple appeals in death-penalty cases and damage caps, 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 effect of a single cognitive illusion will skew the litigation process, as any single reform will fail to reduce the effects of other illusions. Furthermore, efforts to curb the effects of a single illusion will likely have an adverse effect on one category of litigants. For example, the hindsight bias generally makes it easier for tort plaintiffs to prove their case 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 plaintiffs' attorneys can ask for large damage awards from judges and juries, which then anchor the final award, whereas defendants typically cannot do so without first 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 in favor of defendants. 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."<sup>215</sup> 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 are free from bias or prejudice against either litigant, fully understand the relevant law, and know all of the relevant facts, they may still make systematically erroneous decisions under some circumstances simply because of how they--like all human beings--think

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,

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<sup>215</sup> KEETON, *supra* note 26 at 1.

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emotions, and other individuating factors.”<sup>216</sup> Despite their best efforts, however, judges are vulnerable to the influence of the cognitive illusions that we have described in this Article.

All is not bleak, however, because judges, litigants, and the legal system as a whole can take steps to minimize the effects of these cognitive illusions. Nevertheless, these illusions will persist. Additional psychological and legal scholarship devoted to exploring the various ways that the cognitive processes of legal actors have, 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 Jerome Frank put it:

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<sup>216</sup> Nugent, *supra* note 20, 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.”)

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To the extent that one goes to sleep in a dream of unattainable perfections, he becomes a victim of uncertainties, which he ignores for which he therefore fails to allow. The courageous attitude of accepting uncertainty 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 detected, 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 near to perfection.<sup>217</sup>

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<sup>217</sup> FRANK, *supra* note 4, at 426.