

Judicial Intuition

Chris Guthrie*

Andrew J. Wistrich**

Jeffrey J. Rachlinski***

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ABSTRACT

Do judges make decisions by intuition or by careful deliberation? Debate has raged for many decades, but without much hard evidence. Contemporary psychological research demonstrates that people possess two cognitive systems for making decisions, an intuitive system and a deliberative system. Although each operates simultaneously, the intuitive system is faster and requires less effort. Relying on this research and our own research on judges, we propose an intuitive-override model of judging in which the principal task judges face is deciding whether to rely on intuition, or to override intuition with deliberation.

* Associate Dean for Academic Affairs & Professor of Law, Vanderbilt Law School.

** Federal Magistrate Judge, United States District Court, Central District of California.

*** Professor of Law, Cornell Law School.

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INTRODUCTION

How do judges judge? Two dominant models of judging offer different answers to this question. One model, which might be best termed “deductive” emerges from legal formalism. For formalists, the judicial system is little more than a “giant syllogism machine, with a determinate, externally mandated legal rule supplying the major premise, and objectively ‘true’ pre-existing facts providing the minor premise.”¹ Even scholars with radically different views concerning the source of law, however, such as Ronald Dworkin, embrace this deliberative, deductive model. For Dworkin, the judge’s task is to be a Herculean calculator, folding a huge array of considerations into every decision.² In sharp contrast is the “intuitive” model of the judge, most closely associated with early instantiations of legal realism. This model is perhaps best characterized by the notion of the judicial hunch. As described by Joseph Hutcheson, “the judge really decides by feeling, and not by judgment; by ‘hunching’ and not by ratiocination.”³

Are judges “highly skilled mechanics” who make rational and logical decisions? Or are they intuitive hunch-makers who feel their way to decisions that they later justify with deliberation? The decades of debate on judging have produced a mountain of scholarship, but scant hard evidence as to whether judges rely on cognitive processes that would suit either the deductive or the intuitive styles. Empirical evidence on judicial decision making exists, of course, but virtually all of it arises

¹ Burt Neuborne, *Of Sausage Factories and Syllogism Machines: Formalism, Realism, and Exclusionary Selection Techniques*, 67 N.Y.U. L. REV. 419, 421 (1992). For other depictions of the formalist approach to judging, see, for example, BRIAN BIX, *JURISPRUDENCE: THEORY AND CONTEXT* 153-54 (1996) (describing judging as “a nearly mechanical, nearly syllogistic move from basic premises to undeniable conclusion”); Brian Leiter, *Review Essay: Positivism, Formalism, Realism*, 99 COLUM. L. REV. 1138, 1145-46 (1999) (describing legal formalism as a “descriptive theory of adjudication according to which (1) the law is rationally determinate, and (2) judging is mechanical. It follows, moreover, from (1), that (3) legal reasoning is *autonomous*, since the class of *legal* reasons suffices to justify a unique outcome; no recourse to non-legal reasons is demanded or required”).

² RONALD DWORKIN, *LAW’S EMPIRE* 254-58 (1986) (describing the role of the judge).

³ Joseph C. Hutcheson, Jr., *The Judgment Intuitive: The Function of the ‘Hunch’ in Judicial Decision*, 14 CORNELL L.Q. 274, 285 (1929). See also, *id.*, at 278-79 (describing his decision making process as a judge as one in which “I . . . give my imagination play, and brooding over the cause, wait for the feeling, the hunch—that intuitive flash of understanding . . .” and distinguishing that from “the rationalization by the judge on that pronouncement”); JEROME FRANK, *LAW AND THE MODERN MIND* 111-12 (1970) (sixth printing) (quoting Hutcheson and characterizing it “as an approximately correct description of how all judges do their thinking”); See also, EDWARD LEVI, *INTRODUCTION TO LEGAL REASONING* 1-6 (1949) (describing judicial reasoning as fundamentally intuitive). Note that scholars often distinguish between the Frank/Hutcheson approach to realism and the more moderate approach taken by other scholars in the legal realist movement. See BIX, *supra* note __, at 154; Leiter, *supra* note __, at 1148.a

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from political scientists testing the so-called “attitudinal model” of judging.⁴ This model falls squarely into the legal realism camp. Even though the attitudinal model does not identify the judicial hunch as the foundation of legal reasoning, the model similarly treats judicial decision making as the product of beliefs and impressions, with reasoning processes added on as window dressing. The attitudinal model holds that judges have policy preferences they seek to implement through their decisions. Judges are constrained only by their fear of reversal by a superior court (or a legislature).⁵ Our work is a departure from this research in that it addresses the cognitive abilities of judges, rather than their attitudes.

We propose that judges fall somewhere between the “deductive” model often associated often with legal formalism and the “intuitive” model often associated with legal realism. We argue, and attempt to demonstrate below, that an analysis of the cognitive styles that judges use to make decisions supports neither the formalist nor the realist conceptions of the judiciary. Rather, the judicial cognitive style is characterized *both* by deduction and intuition. Judges rely on their intuitions, but sometimes override their intuitions with deliberative decisions. Both processes operate simultaneously and the principal challenge for a judge consists of deciding when to trust their intuition and when to override it with deliberation. We thus propose an “intuitive-override” model of judicial decision making that can best be characterized as realistic formalism.⁶ Our model is realist in the sense that it recognizes the power of the judicial hunch and formalist in the sense that it recognizes the importance of rule-based deliberation as a means of constraining the inevitable, but oft-times undesirable influence of intuition.

We derive our intuitive-override model from theoretical developments in psychology, which suggest that people possess two decision-making systems: an automatic and intuitive system and a calculating and deliberative system. We then present two bodies of experimental data showing that judges, like the rest of us, commonly rely on the automatic, intuitive system, but also sometimes override this system with the product of deductive thought. We first provide evidence from the

⁴ The most recent addition to this literature is CASS R. SUNSTEIN, DAVID SCKADE, LISA M. ELLMAN & ANDRES SAWICKI, *ARE JUDGES POLITICAL? AN EMPIRICAL ANALYSIS OF THE FEDERAL JUDICIARY* (2006). A thorough of the literature on the empirical support for the attitudinal model can be found at Daniel R. Pinello, *Linking Party to Judicial Ideology in American Courts: A Meta-Analysis*, 20 JUSTICE SYSTEM J. 219 (1999).

⁵ Judge Richard Posner, in an implicit embrace of the attitudinal model, asserts that judicial reasoning constitutes little more than a thinly veiled effort to justify political decisions, so as to insulate them from review—a process he cynically refers to as “the judicial game.” RICHARD A. POSNER, *OVERCOMING LAW* 131-34 (1995).

⁶ See also Dan Simon, *A Third View of the Black Box: Cognitive Coherence in Legal Decision Making*, 71 U. CHI. L. REV. 511 (2004) (proposing a “coherence-based reasoning” approach to judicial decision making).

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recently developed “cognitive reflection test”⁷ (“CRT”). The CRT assesses a decision maker’s ability to identify situations in which their intuitive intelligence will lead them astray. It has attracted attention not only in the scholarly literature but also in the financial and popular press.⁸ We find that judges, like the others, commonly make judgments intuitively, rather than reflectively. The CRT, however, only assesses judgment *in general*, rather than in any particular context. To show that judges tend to make intuitive decisions in legal settings, we also provide examples from our studies of judicial decision making showing various ways in which trial judges make largely intuitive decisions.

These data provide support for the intuitive-override model of judging that we propose. This model of judging raises two important questions for litigants, lawyers, judges, and the civil and criminal justice systems, each of which we ask and answer below: First, which of the two decision making approaches – intuitive or deliberative—is preferable? For reasons we explain below, we believe deliberative decision making is more likely than intuitive decision making to lead to just outcomes, though intuitive judgments are frequently “good enough.” Second, given our response to the first question, what might the justice system do to induce judges to decide more matters in a deliberative way (and therefore to produce more just outcomes)? We identify some aspects of the legal system that facilitate deliberative judgment.

At the outset, it is important to locate our model in the spectrum of research on judges. We recognize that judges, of course, make many different kinds of decisions. They find facts, evaluate witness credibility, rule on motions (both lengthy and minute), and decide matters of law. Much of the historic debate on the role of judges, however, specifically concerns their role as the deciders (or creators) of law itself. Indeed, the trial judge often seems like a neglected soldier, even though they are on the front lines of the legal system. By contrast our theory arises from our research on trial judges. We do not, as most researchers do, try to model decisions of the appellate courts that to see if they are politically motivated and found a theory of judging on the results. Our focus on the everyday work of the courts, rather than the lofty decisions of a small group of high-court judges. Our model of judging is, in a sense, built from the ground up, rather than the top down. This is probably why our approach differs so markedly from that of others who have written about judges. Even though our work addresses trial judges, because we are trying to capture the essence of what it means to be a professional judge. Thus, we believe it is broadly applicable to the many different kinds of decisions that judges make.

⁷ Shane Frederick, *Cognitive Reflection and Decision Making*, 19 J. ECON. PERSPECTIVES 25, 27 f.1 (2005).

⁸ See, e.g., Virginia Postrel, *Would You Take the Bird in the Hand, or a 75% Chance at the Two in the Bush*, N.Y. TIMES, January 26, 2006; Peter Ranscombe, *The Three Questions that Will Show How Clever (or Not) You Really Are*, THE SCOTSMAN, July 24, 2006; SMARTMONEY article in February/March/April 2006.

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I. THE INTUITIVE-OVERRIDE MODEL OF JUDGING

The model of judging we propose distinguishes between intuitive processes on the one hand and deliberative processes on the other. Philosophers have long drawn this distinction.⁹ In *Rules for the Direction of Our Native Intelligence*, for example, Descartes claimed that “intuition and deduction” are the two processes “by means of which we are able to arrive at a knowledge of things.”¹⁰ Likewise, in his *Pensees*, Pascal distinguished between the “intuitive” mind and the “mathematical” mind.¹¹ “[I]n the intuitive mind,” he explained, “the principles are found in common use and are before the eyes of everybody. One has only to look, and no effort is necessary.”¹² In the “mathematical” mind, by contrast, “the principles are palpable, but removed from ordinary use; so that for want of habit it is difficult to turn one’s mind in that direction.”¹³

Similar themes run through modern philosophical thinking on judgment. Rawls argued that moral judgment, at least, is best characterized by a “wide reflective equilibrium.”¹⁴ In his view, people make intuitive judgments and then check them against background principles and theories about the world in a deliberative fashion. Rawls asserts that this process repeats itself until beliefs coalesce, thereby inducing a consistency (or an equilibrium) between intuitive and deliberative systems.

⁹ See, e.g., Seymour Epstein, *Integration of the Cognitive and the Psychodynamic Unconscious*, 49 AM. PSYCHOL. 709, 712 (1994) (“Awareness of a distinction between an experiential and a rational mode of processing information has a long history, predating psychology as a formal discipline.”); Steven A. Sloman, *Two Systems of Reasoning*, in HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 379, 380 (Thomas Gilovich, Dale Griffin & Daniel Kahneman eds., 2002) [hereinafter HEURISTICS AND BIASES] (observing that the intuition versus deliberation distinction “has not been missed by philosophers and psychologists” and “can be traced back to Aristotle”) [hereinafter Sloman, *Two Systems*].

¹⁰ RENE DESCARTES, RULES FOR THE DIRECTION OF OUR NATIVE INTELLIGENCE Rule III, p. 3.

¹¹ BLAISE PASCAL, PENSEES (1670) (emphasis added).

¹² *Id.*

¹³ *Id.*

¹⁴ JOHN RAWLS, A THEORY OF JUSTICE 14-21, 43-53, 578-82 (1971). See also, Norman Daniels, *Wide Reflective Equilibrium and Theory Acceptance*, 76 J. PHILOSOPHY 256 (1979) (elaborating on Rawls’ theory). Some psychologists have embraced this position as well. Mark van Roojen, *Reflective Moral Equilibrium and Psychological Theory*, 109 ETHICS 846 (1999).

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Building on these insights, as well as the decades of research on judgment and choice, psychologists have proposed several “dual system” or “two-process” models of cognition.¹⁵ Although the models vary, they all include a distinction between “intuitive” processes and “deliberative” processes.¹⁶ Intuitive processes, also called “System 1” processes,¹⁷ “occur spontaneously and do not require or consume much attention.”¹⁸ They are “automatic, heuristic-based, and relatively undemanding of computational capacity.”¹⁹ Or, more simply, they are “spontaneous, intuitive, effortless, and fast.”²⁰ Deliberative processes, also called “System 2” processes,²¹ are “mental operations requiring effort, motivation, concentration, and the execution of learned rules.”²² Associated with “controlled processing,”²³ they are “deliberate, rule-governed, effortful, and slow.”²⁴ Both processes operate in parallel, in that they each function simultaneously.

¹⁵ See, e.g., Epstein, *supra* note __, at 711 tbl.1, 715-19 (proposing a “cognitive-experiential self theory” which includes an “experiential” system and a “rational” system); Jonathan St B.T. Evans, *Heuristic and Analytic Processes in Reasoning*, 75 BRITISH J. PSYCHOL. 451 (1984) (proposing a dual system model including a “heuristic” system and an “analytic” system); Daniel Kahneman & Shane Frederick, *Representativeness Revisited: Attribute Substitution in Intuitive Judgment*, in HEURISTICS AND BIASES, *supra* note __, at 49, 50-51 (making this claim and proposing their own model); Sloman, *Two Systems*, *supra* note __, at 380-84 (proposing a dual system model with an “associative” system and a “rule-based” system); Keith E. Stanovich & Richard F. West, *Individual Differences in Reasoning: Implications for the Rationality Debate?*, in HEURISTICS AND BIASES, *supra*, at 421, 436-38 (observing the burgeoning dual system models); Steven A. Sloman, *The Empirical Case for Two Systems of Reasoning*, 119 PSYCHOL. BULL. 3, 3-8 (1996) (proposing a dual system model with an “associative” system and a “rule-based” system). See generally DUAL-PROCESS THEORIES IN SOCIAL PSYCHOLOGY (Shelly Chaiken & Yaacov Trope eds., 1999).

¹⁶ Kahneman & Frederick, *supra* note __, at 50.

¹⁷ Stanovich & West, *supra* note __, at 436 (devising this label).

¹⁸ Frederick, *supra* note __, at 26.

¹⁹ Stanovich & West, *supra* note __, at 436.

²⁰ Kahneman & Frederick, *supra* note __, at 49 (referencing Tversky & Kahneman’s earlier study of mathematically oriented psychologists).

²¹ Stanovich & West, *supra* note __, at 436 (devising this label).

²² Frederick, *supra* note __, at 26.

²³ Stanovich & West, *supra* note __, at 436.

²⁴ Kahneman & Frederick, *supra* note __, at 49 (referencing Tversky & Kahneman’s earlier study of mathematically oriented psychologists).

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The dual process model of judging we propose, based on a model developed by Daniel Kahneman and Shane Frederick, posits that judges make initial intuitive judgments (System 1), which they might (or might not) override with deliberation (System 2). As Kahneman and Frederick explain their model:

System 1 quickly proposes intuitive answers to judgment problems as they arise, and System 2 monitors the quality of these proposals, which it may endorse, correct, or override. The judgments that are eventually expressed are called *intuitive* if they retain the hypothesized initial proposal without much modification.²⁵

This model is similar to the model proposed by psychologist Steven Sloman.²⁶ He uses the terms “associative” rather than “System 1” (or “intuitive”) and “rule-based” rather than “System 2” (or “deliberative”),²⁷ but he conceives of the judgment process in substantially the same way:

Both systems seem to try, at least some of the time, to generate a response. The rule-based system can suppress the response of the associative system in the sense that it can overrule it. However, the associative system always has its opinion heard and, because of its speed and efficiency, often precedes and thus neutralizes the rule-based response.²⁸

Just as 11 dimensions seem to be essential to explaining the forces in the universe with “string theory” in physics, so too do two independent process seem to be important to account for factors that influence human judgment. Psychologists assessing the problem of judgment from many different approaches have independently settled on dual-process models.²⁹ Indeed, psychologists have generated more than twelve different dual-process models of judgment, all of which

²⁵ *Id.* at 51.

²⁶ See Sloman, *Two Systems*, *supra* note __. See also Stanovich & West, *supra* note __, at 439 (“[O]ne of the functions of System 2 is to override some of the automatic contextualization provided by System.”). This model also bears some resemblance to the more general “inferential correction” model of judgment proposed by Daniel Gilbert. See Daniel T. Gilbert, *Inferential Correction*, in *HEURISTICS AND BIASES*, *supra* note __, at 167, 167 (“[O]ne of psychology’s fundamental insights is that judgments are generally the products of nonconscious systems that operate quickly, on the basis of scant evidence, and in a routine manner, and then pass their hurried approximations to consciousness, which slowly and deliberately adjusts them.”).

²⁷ See note __, *supra*.

²⁸ Sloman, *Two Systems*, *supra* note __, at 391.

²⁹ See SHELLEY CHAIKEN & YAACOV TROPE, *DUAL-PROCESS THEORIES IN SOCIAL PSYCHOLOGY* (1999) (cataloguing various models of judgment and choice).

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incorporate a quick, intuitive process and a slower, deliberative process.³⁰ Furthermore, studies of brain function reveal that people use different parts of the brain for different kinds of decisions. MRI scans of the brain reveal that the prefrontal lobes of the brain are most active when people are making deliberative decisions,³¹ while the lateral temporal lobes, amygdala, and basal ganglia are active during intuitive, reflexive thought.³² Dual-process models of judgment are thus the product of a both conventional social psychology and novel neuropsychological research.

Most dual-process models in psychology, however, fail to provide any way to predict when a person will choose to rely on System 1 as opposed to System 2. One exception is the work of Jonathan Haidt. Haidt proposes that people make aesthetic and moral judgments almost exclusively with System 1.³³ We observe a great deal argument and logic concerning both morality and aesthetics, but Haidt's work reveals much of it to be post hoc rationalization. He reviews decades of research on moral judgment and concludes that people experience immediate affective experiences in reaction to stories that implicate moral and aesthetic judgment. Their affective response predicts their judgment of conduct as moral or immoral and only then does reasoning follow. Consider this example from Haidt's research:

A family's dog was killed by a car in front of their house. They heard that dog meat was delicious, so they cut up the dog's body and ate it for dinner.³⁴

Haidt and his colleagues found that most people experience an immediate, emotional reaction to this story. It elicits disgust in many people. The reaction varies a bit between people of different cultures, but the sense of disgust (or its absence) predicts the reasoning that follows. Those who experience disgust generate a reasoned account of why the family's conduct was wrong while those who do not experience disgust generate a reasoned account of why the conduct was morally acceptable. The content of the reasoning seems to follow as after the instantaneous, System 1, emotional response. Haidt contends that most moral reasoning operates just as a lawyer defending

³⁰ *See id.*

³¹ *See* Elkhonon Goldberg, *The Executive Brain* (2001); Matthew D. Lieberman, Ruth Gaunt, Daniel T. Gilbert & Yaacov Trope, *Reflection and Reflexion: A Social Cognitive Neuroscience Approach to Attributional Inference*, 34 *ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY* 199 (2002).

³² *See* Daniel Schrieber & Maco Iacoboni, *Evaluating Political Questions: Neural Systems and Functional Mechanisms*. Working paper, available at <http://www.wcfia.harvard.edu/seminars/pegroup/Schrieber2004.pdf>.

³³ Jonathan Haidt, *The Emotional Dog and its Rational Tail: A Social Intuitionist Approach to Moral Judgment*, 108 *PSYCHOL. REV.* 814 (2001).

³⁴ Jonathan Haidt, Silvia Helena Koller & Maria G. Dias, *Affect, Culture, and Morality, or Is It Wrong to Eat Your Dog?* 65 *J. PERSONALITY & SOC. PSYCHOL.* 613, 617 (1993).

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a client; the decision as to which side the lawyer is on has already been made, and the only task is to provide the best justification for the position one can.³⁵

Haidt's theory of the primacy of System 1 in moral judgments suggests that the realists have it right; System 1 dominates. But are legal judgments just like moral judgments? Haidt's analogy between moral reasoning and how a lawyer defends a client sounds similar to Judge Posner's description of "the judicial game."³⁶ Preferences come first and reason follows in both Haidt and Posner's accounts. The similarities might be superficial, however. Unlike morality or aesthetics, judicial reasoning occurs in the context of a highly rule-bound system. Furthermore, the purpose of judging, at least at trial, is often to identify some truth (whether an act occurred, what the mental state of an actor was, etc.), which differs from a moral judgment made of a certain act. Haidt himself is careful to distinguish the task of a judge, likening it to that of a scientist.³⁷ Judging might be more like solving a puzzle than judging a work of art. As we discuss below, solving puzzles sometimes also produces a quick, System 1 response. But often, people (sensibly) approach logical problems with logical thought, rather than intuition. Judges, we suggest, experience the kind of emotional response that drives moral thinking, but sometimes ignoring this System 1 reaction in favor of a System 2, deductive process.

Peoples' heavy reliance on System 1 is not necessarily detrimental to sound reasoning. As Malcolm Gladwell documented in his popular book, *Blink*, System 1 reasoning can be superior to System 2 reasoning.³⁸ Gladwell opens his book by describing the Getty Museum's decision to acquire a statue.³⁹ Although their own, highly deliberative review suggested their acquisition was a valuable ancient Greek statue, many experts spotted it immediately as a fake, even before they could articulate exactly why. The experts' intuitive systems told them (correctly, as it turns out) that the statue did not look right. Systematic research supports the point that the anecdote makes. Research by Jonathan Schooler demonstrates that imposing System 2 thinking on decision makers can undermine their decisions. Problems for which imagery is critical are actually harder to solve if people are asked to explain themselves as they reason.⁴⁰ One important component to good judgment, therefore, is knowing when to rely on intuition and when to override it with deliberation.

³⁵ Haidt, *supra* note __, at 820-22 (likening the process of moral reasoning to "a lawyer defending a client")

³⁶ Posner, *supra* note __, 1t 131-34.

³⁷ Haidt, *supra* note __, at 820 ("The [moral] reasoning process is more like a lawyer defending a client than a judge.")

³⁸ MALCOLM GLADWELL, *BLINK: THE POWER OF THINKING WITHOUT THINKING* (2005).

³⁹ *Id.* at 3-8.

⁴⁰ Jonathan W. Schooler, Stellan Ohlson & Kevin Brooks, *Thoughts Beyond Words: When Language Overshadows Insight*, 122 J. EXPERIMENTAL PSYCHOL. 166 (1993).

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We suspect that what is true for most ordinary decision makers is also true for judges. Judges experience the intuitive quick, easy reaction that would dictate a certain outcome if embraced as correct. But they also possess the capacity to override their intuition with slow, complex, deliberative judgments. Obviously, in many cases, the two systems will converge on a single decision, which would make the judge's job easy. Indeed, doubtless a large percentage of judicial decisions are easy and uncomplicated. In our view, the critical task for judges in harder cases is to decide which system to rely upon to make their decisions. Because intuitive judgments occur simply and quickly, while deliberative judgments can be complex and slow, relying on the intuitive, System 1 response is the easiest way to make a decision. To make fair and accurate rulings, however, a judge must know when and how to be more deliberative. Our data support our assertion that judges will often rely on their intuitive faculties, while sometimes turning to their deliberative faculties to override their initial intuitions.

II. TESTING THE MODEL

To explore whether judges make judgments in predominantly intuitive ways, we tested their performance on a general test of cognitive reflection and on a series of judicial decision making problems. This work, explored in detail below, supports our theory that judges rely largely on intuition, but sometimes override their intuition with deductive reasoning.

A. The Cognitive Reflection Test

The recently developed "Cognitive Reflection Test" or "CRT" is a three-item test designed to assess intuitive versus reflective processing.⁴¹ More precisely, the CRT measures "cognitive reflection," which Shane Frederick, the CRT's creator, describes as "the ability or disposition to resist reporting the response that first comes to mind."⁴² The CRT appears below in its entirety:

⁴¹ Frederick, *supra* note __, at 27. Frederick was also interested in exploring whether there is any correlation between CRT scores on the one hand and time and risk preferences on the other.

⁴² *Id.* at 35.

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- (1) A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?
_____ cents
- (2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?
_____ minutes
- (3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?
_____ days

Each of the three CRT items has a correct answer that is easy to understand; each also has an intuitive, but incorrect, answer that almost immediately comes to mind. Consider the first question, which asks subjects to indicate how much a ball costs, after explaining that the total cost of a bat and ball is \$1.10 and that the bat costs \$1 more than the ball. For many people, the answer that immediately jumps to mind is 10 cents.⁴³ Though intuitive, this answer is wrong, as a bit of reflection shows. If the ball costs 10 cents, and the bat costs one dollar more, this means that the bat costs \$1.10. Adding those two figures together, the total cost of the bat and ball would be \$1.20, not \$1.10, as specified by the problem. The correct answer is thus five cents. That is, the ball costs five cents, the bat costs \$1.05, and together, they cost \$1.10.

The second question asks subjects to indicate how many minutes it would take 100 machines to make 100 widgets if five machines can make five widgets in five minutes. Again, for many people, the answer that immediately jumps to mind is 100 minutes.⁴⁴ Though intuitive, this answer is also wrong. If five machines make five widgets in five minutes, this means that each machine makes one widget in that five-minute time period. Thus, it would take only five minutes for 100

⁴³ *Id.* at 27.

⁴⁴ *Id.*

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machines to produce 100 widgets (just like 200 machines would make 200 widgets in that same five-minute period).⁴⁵

The third question specifies that a patch of lily pads, doubling in size every day, will completely cover a lake in 48 days. Given that, the question asks subjects to indicate how long it will take the patch to cover half the lake. For many people, the answer that immediately jumps to mind is 24 days, which is wrong.⁴⁶ The correct answer, obvious upon reflection, is 47 days. If the patch of lily pads doubles each day and fully covers the lake on the 48th day, it will cover half the lake the day before. Thus, the correct answer is 47 days, not 24 days.

The CRT items are simple in that “their solution is easily understood when explained,” but “reaching the correct answer often requires the suppression of an erroneous answer that springs ‘impulsively’ to mind.”⁴⁷ Most people, it turns out, are unable to suppress that impulsive response. In 35 separate studies involving nearly 3,428 respondents, Frederick found that subjects, on average, got 1.24 of the three items correct, though responses varied across the subject pools.⁴⁸ For example, students at the University of Toledo obtained an average score of .57, while students at MIT obtained an average score of 2.18.⁴⁹ Among all of the subjects tested, only 17% got all three questions correct; nearly twice that many (33%) got all three questions wrong.⁵⁰

Among his other results, Frederick found that CRT scores are correlated with time preferences. Those who scored higher on the CRT were generally more willing to delay

⁴⁵ This problem implicitly assumes that each machine produces widgets at the same rate. Given the structure of the problem as well as the responses of subjects, we have reason to believe that subjects adopt the same assumption when confronted with this problem.

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.* at 29, tbl.1.

⁴⁹ *Id.*

⁵⁰ Moreover, Frederick found gender differences with regard to time and risk preferences, as explained below:

The curious finding that CRT scores are more tightly linked with time preferences for women than for men, but are more tightly linked with risk preferences for men than for women held for the other tests of cognitive ability, as well. Expressed loosely, being smart makes women patient and makes men take more risks.

Id. at 38.

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gratification and reward.⁵¹ This leads to slightly different consumer preferences, as Frederick found that those who score high on the CRT prefer the New Yorker to People magazine, whereas those who score low in the CRT prefer People to the New Yorker.⁵² Furthermore, that CRT scores are also correlated with risk preferences; those high in CRT were less sensitive to the character of a decision as involving gains from the status quo or losses from the status quo.⁵³ Finally, although he had no explanation for the finding, Frederick found that men scored higher than women on the CRT.⁵⁴

Although the CRT consists of only three items, it correlates highly with the Wonderlic Personnel Test⁵⁵ (an intelligence test used by, among others, the National Football League⁵⁶) and the SAT⁵⁷ and ACT⁵⁸ (achievement tests used in college admissions). In effect, the CRT acts as an abbreviated IQ test of sorts, in that it seems to measure some component of intelligence. But it would be a mistake to think of the CRT as just an abbreviated IQ test. The CRT assesses a subset of what psychologists measure as intelligence. Frederick is a bit coy about precisely what the 3-item CRT is measuring, however. His assertion that it measures “the ability or disposition to resist reporting the response that first comes to mind,”⁵⁹ is somewhat vague. The CRT might be measuring the decision maker’s *willingness* to attend carefully to logical problem, or their *ability* to detect problems that produce intuitive but inaccurate answers. If the former, the CRT might shed little light on the behavior of judges, who might well be more willing to expend cognitive effort on the cases before them than the abstract problems in the CRT. But the surprisingly high correlation between the CRT and other standard measures of intelligence suggest that the test measures the latter.

The generally low scores on the CRT suggest that people often make intuitive judgments when they should be reflective. Four additional pieces of evidence from the CRT studies provide further support for this conclusion: First, among all of the potentially incorrect responses to these

⁵¹ *Id.* at 30

⁵² *Id.* at 39-40, at footnote 15.

⁵³ *Id.* at 33 (“In the domain of gains, the high CRT group was more willing to gamble . . . For items involving losses, the high CRT group was *less* risk seeking . . .”).

⁵⁴ *Id.* at 37.

⁵⁵ The correlation is .43. *Id.* at 35, t.4.

⁵⁶ http://www.wonderlic.com/Promotion/NFL_press_release.asp.

⁵⁷ The correlation between the CRT and the SAT as a whole is .44. Frederick, *supra* note __, at 35, t.4.

⁵⁸ The correlation between the CRT and the ACT is .46. *Id.* at 35, t.4.

⁵⁹ *Id.* at 35.

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questions, the intuitive answers identified above (e.g., 10 cents rather than 5 cents in the bat-and-ball problem) are most common.⁶⁰ Second, even among those responding correctly, Frederick found, based on “introspection, verbal reports and scribbles in the margin,” that subjects often considered the intuitive answer before selecting the correct answer.⁶¹ Third, subjects who selected the intuitive answers were more likely than those who answered correctly to indicate that the problems were easy. In the bat-and-ball problem, for instance, subjects who provided the intuitive response (10 cents) predicted that 92% of people would solve the problem correctly; by contrast, subjects who responded correctly predicted that only 62% of people would solve the problem correctly.⁶² Finally, subjects do much better on structurally similar problems that invite computation rather than impulsive responses. By way of illustration, Frederick explains that subjects “miss the ‘bat and ball’ problem far more often than they miss the ‘banana and bagel’ problem: ‘A banana and a bagel cost 37 cents. The banana costs 13 cents more than the bagel. How much does the bagel cost.’”⁶³

B. The CRT and Trial Judges

To explore whether judges, like Frederick’s subjects, are inclined to make intuitive rather than reflective judgments, we included the CRT in a five-item questionnaire we administered to 295 trial judges attending the Annual Business Meeting of the Florida Conference of Circuit Judges in Naples, Florida, on June 12, 2006.⁶⁴ The Circuit Court judges in Florida represent the primary trial judges in the state for civil, criminal, and family court matters. At this conference, we presented a plenary educational session to the judges entitled, “Judicial Decision Making.” Most of the judges attending the conference attended our session (we do not have an exact count of the conference attendance), and no other sessions ran at the same time as ours. At the outset of our session, we distributed our questionnaires to the judges in person. We asked the judges to read and respond to each of the questions and to do so independently. The materials contained a cover page indicating the name of the conference and providing the following instructions:

Many of the points to be discussed at this session are best 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. Please do not discuss these materials while you are reviewing them, and please review the materials in the order presented. We shall collect these surveys before the discussion and present the results during this session.

⁶⁰ *Id.* at 27.

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.* at 28.

⁶⁴ Stimulus materials on file with the authors.

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At the beginning of the session, one of us (Wistrich) introduced himself, and asked the judges to read and respond to the survey in front of them. He requested that they do so quietly, assured them that we were not collecting their names or other identifying information, and informed them that we would score the results and present them back to them at the end of the session. The judges appeared to take the questionnaires seriously. The room was silent during the administration of the questionnaires, which took approximately 15 minutes.

Because we did not ask the judges to identify themselves, all responses were anonymous. We also informed the judges that participation in the survey was entirely voluntary. The final page of the questionnaires gave the judges the opportunity to limit the use of their answers to discussion during their particular conference, thereby excluding them from discussion in other contexts and from use in any publication. One judge (out of 296 who received the surveys) exercised this option and we have excluded the results from this judge.

The fourth item in our survey consisted of the CRT.⁶⁵ The fifth and last page asked the judges for some basic demographic information: their gender, the number of years of experience as a judge, which of the two major political parties in the United States they most closely identify with, which aspects of the circuit court have they had experience with (civil, criminal, family, probate, or other) whether they had previous experience as a prosecutor, and whether they had previous experience as a defense attorney. Of the 295 judges who returned surveys, 252 completed all of the items on the CRT.⁶⁶ This means that nearly half of the circuit court judges in the Florida state courts completed the CRT.⁶⁷

At the top of the page that included the CRT, we provided the judges with the same instructions Frederick provided to the subjects who participated in his studies: “Below are several problems that vary in difficulty. Try to answer as many as you can.”⁶⁸ Beneath the instructions, we reproduced the CRT, and beneath each of the three CRT items, we asked the judges to predict “[w]hat percentage of the judges in this room do you think will obtain the correct answer on this problem?”⁶⁹

⁶⁵ The first three questions consisted of responses to hypothetical case scenarios.

⁶⁶ 7 judges answered none of the questions and 288 judges answered at least one of the questions. But we include only the 252 judges who answered all three in further analysis.

⁶⁷ See TOTAL STATEWIDE JUDGESHIPS, http://www.flcourts.org/gen_public/stats/bin/legauthorizedjudgesforweb.pdf, visited on August 6, 2006 (reporting that there were 564 circuit court *judgeships* authorized during the 2005-2006 fiscal year and 599 during the 2006-2007 fiscal year).

⁶⁸ Compare Frederick, *supra* note ___, at 28 to stimulus materials on file with the authors.

⁶⁹ See stimulus materials on file with the authors.

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The judges obtained an average score of 1.23 out of a possible 3.00. This score is slightly higher than the scores achieved by student-subjects at Michigan and slightly lower than the scores achieved by student-subjects at Harvard.⁷⁰ Nearly one-third of the judges, 30.6%, to be precise, failed to get a single question right; 31.0% answered one correctly; 23.8% answered two of the three correctly; and 14.7% of the judges answered all three questions correctly. That the judges, as a group, produced results consistent with those of college students at highly selective universities suggests that judicial decision-making skills are comparable to those of any ordinary group of well-educated adults.

The judges' performance improved as they progressed through the three questions, scoring 24.2%, 44.0%, and 50.4% correct on the first, second, and third questions, respectively. That result is odd, in that the second question is computationally more challenging than the first, and yet more judges get it right. Frederick's account of the CRT, however, would predict precisely this pattern, because the second question seems more difficult to those taking the test. The complexity of the second question cues the test taker that they perhaps should not trust their intuition. None of the questions is truly technically challenging to answer. Rather the challenge lies in identifying that an intuitive, System 1 response leads to the wrong answer and to then rely on a deliberative, System 2 assessment.

The judges who answered incorrectly tended to select the intuitively obvious, but inaccurate, responses. On the bat-and-ball question, 96.5% of those answering incorrectly (191 of 198 judges) selected the intuitive answer (10 cents). On the widget question, 59.5% of those answering incorrectly (88 of 148 judges) selected the intuitive answer (100 minutes). And on the lily pad question, 68% of those answering incorrectly (83 of 122 judges) selected the intuitive response (24 days).⁷¹

⁷⁰ Frederick, *supra* note __, at 27, tbl.1. Note that our results might overstate the judges' abilities on this problem, as we excluded from the analysis the 43 judges who failed to answer all three questions. Possibly, these judges did not respond so as to avoid answering difficult questions. Among the 36 judges who answered 1 or 2 questions only, the percentage of correct answers was 27.4% (17 out of 62), which is a little lower than the percentage correct among judges who answered all three questions (41%). The pattern on non-responses, however, produced a dizzying array of combinations that does not clearly support any prediction as to what the judges would have done had they answered all three questions: 7 declined to answer any of the questions; 6 answered only the first question (5 of these got it wrong); 4 answered only the second question (2 of these got it wrong); 22 answered the first two questions only (12 got them both wrong, 2 got them both right, 1 got the first one right and the second one wrong, and 7 got the first one wrong and the second one right); 3 answered the first and third questions only (2 got them both wrong and 1 got the first one wrong and the third one right); and 1 answered only the second and third questions (and got the second question wrong and the third one right).

⁷¹ For our purposes, the CRT results are interesting primarily because our subjects are trial judges, and we are interested in understanding judicial decision making. These results should be of more general interest as well because, as far as we know, our subjects are among the very first non-student-subjects to be tested, *see* Frederick, *supra* note __, at 29 tbl.1, and the very first group of expert decision makers to

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Finally, the judges who selected the intuitive, but incorrect, answers were more likely than the judges who responded correctly to the problems to indicate that those problems were easy. On the bat-and-ball problem, the mean estimate for the percent of judges who would get the problem correct among the judges who selected the intuitive answer (10 cents) was 90.0%, whereas the mean estimate among judges who actually got the problem right was only 65.7%. This gap was diminished on the subsequent problems, but did not dissipate. On the second problem, the mean estimate among judges who provided the intuitive answer (100 widgets) was 80.0% versus 71.3% among those who provided the correct answer. And on the lily pad problem, the mean estimate of those who provided the intuitive answer (24 days) was 71.4% versus 67.9% among those judges who answered correctly.

Collectively, these results suggest that judges generally use intuitive rather than deliberative faculties when making judgments. This is not uniformly true, of course. Roughly two-thirds of the judges answered one or more of the CRT problems in a deliberative way,⁷² and roughly one-seventh of the judges answered all of the problems in a deliberative way.⁷³ On balance, then, the CRT results suggest that judges generally use intuitive processes to make judgments but that they can, and in some cases do, overcome their intuitive processes to make deliberative judgments.

To be sure, our judges faced less motivation to answer the CRT questions accurately than to make accurate rulings. We did not provide any tangible incentive to the judges, in contrast to Frederick, who, in most of his studies, paid subjects \$8 to complete a lengthy questionnaire.⁷⁴ We do not think this calls our results into question, however, for five reasons. First, even though we did not provide tangible incentives, we did inform the judges before distributing the questionnaires that we intended to share their collective results with the group, which undoubtedly induced at least some judges to try hard on these problems. Second, based on our observation of the survey administration (which was conducted by several judges and us), the judges appeared to take the questionnaires that we distributed quite seriously, completing them in a quiet and focused manner. Third, although this is admittedly anecdotal, the judges appeared deeply interested in learning the results of the CRT, and in subsequent break-out sessions, they sought to discuss these more than any of the other material we presented. Fourth, it is unclear, based on the research evidence, that tangible incentives have any impact on judgment and decision-making performance. Although Frederick paid his subjects, he did not pay them for correct responses. Finally, in contrast to Frederick, who embedded the CRT in a questionnaire designed to take 45 minutes to complete, we included the CRT in a five-item questionnaire designed to take only 15 minutes to complete. Thus, the judges participating in our study, at least relative to the subjects participating in Frederick's

be tested. *Id.*

⁷² See text accompanying note __, *supra*.

⁷³ See text accompanying note __, *supra*.

⁷⁴ Frederick, *supra* note __, at 28.

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studies, were likely less mentally taxed and more attentive. Although we cannot rule out the possibility that more highly motivated judges might perform better on the CRT tasks, we suspect that even highly motivated judges would produce basically the same pattern of results. That is, the error rate would be surprisingly high and errors would arise from reliance on intuitive responses.

The results on the CRT did not vary much by the demographic characteristics of the judges. Unlike Frederick's findings, the 185 male judges produced a similar mean CRT score (1.28) as the 58 female judges (1.21).⁷⁵ Similarly, the 88 judges who identified themselves as Democrats produced a similar mean score (1.16) as the 121 judges who identified themselves as Republicans (1.24).⁷⁶ Neither did years of experience as a judge produce correlate with CRT score.⁷⁷

C. Studies of Judicial Decision Making

The CRT results suggest that judges make intuitive judgments when confronted with *ordinary* decision problems. The fact that judges demonstrate a predominantly intuitive approach to the CRT problems does not necessarily mean that they make predominantly intuitive judgments on the job. In recent years, however, we have conducted several studies involving hundreds of federal and state trial judges around the nation, and we have found evidence that judges commonly make intuitive judgments in judicial contexts, but that they also show a mild proclivity toward overriding this judgment.⁷⁸

We do not intend to catalog our results here. To illustrate the claim we are making in this essay, though, we describe below four examples of how judges react to cues that trigger intuitive decision making. Specifically, we review evidence concerning judicial reactions to: statistical

⁷⁵ This difference was not statistically significant. $t(241) = 1.02$, $p=.31$. (Note that some judges did not report their gender, and hence, the numbers include all 252 judges who answered all three CRT items.)

⁷⁶ This difference was not statistically significant. $t(207) = 0.55$, $p=.58$.

⁷⁷ The correlation between CRT score and years of experience was a scant $-.06$.

⁷⁸ See generally Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Judging by Heuristic: Cognitive Illusions in Judicial Decision Making*, 86 JUDICATURE 44 (2002) (reporting experimental evidence showing that judges are susceptible to "heuristics and biases" when making judgments); Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Inside the Judicial Mind*, 86 CORNELL L. REV. 777 (2001) (same) [hereinafter Guthrie, Rachlinski & Wistrich, *Judicial Mind*]; Jeffrey J. Rachlinski, Chris Guthrie & Andrew J. Wistrich, *Inside the Bankruptcy Judge's Mind*, forthcoming B.U. L. REV. (2007) (exploring whether specialized, bankruptcy judges are similarly susceptible to heuristics and biases); Andrew J. Wistrich, Chris Guthrie & Jeffrey J. Rachlinski, *Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding*, 153 U. PA. L. REV. 1251 (2005) (reporting experimental evidence showing that judges have difficulty deliberately disregarding relevant but inadmissible evidence when making merits decisions).

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evidence, the framing of settlement offers as involving gains versus losses, ex ante conduct after learning of an outcome associated with that conduct, and numeric anchors. Together, this research shows a tendency to rely on intuition that judge sometimes override.

1. Statistical Inferences

The statistical inference process has long proven a fertile ground for psychologists seeking to demonstrate that people often favor intuition over deductive logic. Psychologists have long argued that people rely on intuitive judgments of similarity over logical or statistical inference when making judgments about probability.⁷⁹ Psychologists refer to this tendency as a reliance on the “representativeness heuristic.”⁸⁰ In relying on this heuristic, people tend to undervalue the importance of statistical information. Notably, people tend to discount information about the frequency with which the underlying category occurs, which is known as the “base rate” statistics.⁸¹ In one study, for example, researchers asked college students to indicate whether a person described a being “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 other people” is a student in either computer science or in humanities and education. Although the participants knew that three times as many graduate students study humanities and education as

⁷⁹ 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 & 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: HEURISTICS AND BIASES 84 (Daniel Kahneman, Paul Slovic & Amos Tversky eds., 1982) (synthesizing their prior work on representativeness) [hereinafter Tversky & Kahneman, *Representativeness*].

⁸⁰ 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”).

⁸¹ 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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computer science (at the time), they tended to believe that the student was in computer science.⁸² Base-rate statistics such as this are obviously highly relevant, but people discount its probative value in favor of the intuitive, representativeness of the information.⁸³

To test whether judges would rely on their intuitive assessments of a fact pattern in favor of statistical information, we gave a group of federal magistrate judges the following problem, based on classic English case, *Byrne v. Boadle*:⁸⁴

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

We 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 rely on their intuition. The accident sounds like it is the product of negligence, so it must be the product of negligence.⁸⁵ Like the subjects in Jonathan Haidt's research on moral reasoning, they can find a way to rationalize this answer as well, by noting the 90% figure in the problem, and thereby intuiting that 90% (or something like 90%) is the likelihood that the accident was the product of negligence. In fact, that kind of reasoning converts the true meaning of the 90% statistic (the likelihood of injury given

⁸² Kahneman & Tversky, *Prediction*, *supra* note 120, at 238-39.

⁸³ *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).

⁸⁴ *Byrne v. Boadle*, 2 H. & C. 722, 159 Eng. Rep. 299 (1863).

⁸⁵ *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).

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negligence) to its inverse (the likelihood of negligence given injury). A deductive approach reveals that the actual probability that the defendant was negligent is only 8.3%.⁸⁶

Most of the judges who assessed our problem got it wrong. In fact, only about 40% got it right, and selected the low range as the actual probability that the accident was the result of negligence. Much like the CRT results, the most common wrong answer (also selected by 40% of the judges) was the intuitive response that the accident was more than 75% likely to have been the product of negligence.

Compared to other people who have assessed similar statistical problems, the judges we studied were impressive. Undergraduate students who face such problems typically answer correctly only about 10% of the time⁸⁷ and even fewer doctors analyzing a nearly identical problem in a medical context choose the correct answer.⁸⁸

2. Intuitive Judging – Framing

The second example of intuitive judicial decision making comes from studies of a phenomenon called “framing.”⁸⁹ People tend to evaluate decision options as “gains” or “losses” relative to a neutral reference point, typically the status quo or current state of affairs. When choosing between options that appear to be gains, people tend to make risk-averse decisions;⁹⁰ when

⁸⁶ 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 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 .99% (and the probability that the defendant is not negligent and causes no injury is 98.91%). As a result, the conditional probability that the defendant is negligent given that the plaintiff is injured is .09% divided by 1.08%, or 8.3%.

⁸⁷ 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).

⁸⁸ Ward Cascalls, Arno Schoenberger & Thomas Grayboy, *Interpretation by Physicians of Clinical Laboratory Results*, 299 NEW ENGLAND J. MED. 999, 999-1000 (1978).

⁸⁹ Framing is derived from “prospect theory,” a descriptive decision theory developed by Daniel Kahneman and Amos Tversky. See Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979). There is new evidence for framing from neuroeconomics researchers. See *Study: Emotion Rules the Brain’s Decisions*, USA TODAY, August 7, 2006 (reporting the results of a forthcoming study in *Science* demonstrating framing using brain imaging).

⁹⁰ See, e.g., Amos Tversky & Daniel Kahneman, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, 5 J. RISK & UNCERTAINTY 297, 306 (1992) [hereinafter Tversky & Kahneman, *Advances*]. “A risk averter is defined as one who, starting from a position of certainty, is

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choosing between options that appear to be losses, people tend to make risk-preferring decisions.⁹¹ For example, people will generally choose a \$500 prize over a 50% chance at winning a \$1,000 prize, but will prefer a 50% chance at having to pay a \$1,000 fine over paying a certain \$500 fine.⁹²

Like difficulties with statistical problems, the framing effect arises from the appeal of an intuitive answer. When facing gains, the age-old aphorism of preferring a bird in the hand to two in the bush takes hold, giving the certain option some immediate appeal. An economist would term this simple risk-aversion, and perhaps deliberative scrutiny of a choice would also support a risk-averse choice. But a comparison to the results from the loss frame reveals the role of intuition. Accepting a certain loss produces a negative emotional response that makes the certain choice (now of a loss) feel less appealing than when it was cast as a gain. People who engage in the kind of careful reasoning of an accountant or economist would not be affected by the character of a decision as involving a gain or loss. The evidence that frame matters reveals the influence of System 1 on people's decision making when confronting risky choices. Indeed, Frederick reports that people who score well on the CRT are less affected by frame.⁹³

Litigation often creates a natural frame.⁹⁴ In ordinary lawsuits,⁹⁵ plaintiffs generally choose either to accept a certain settlement offer from the defendant or to proceed to trial in hopes of obtaining a more favorable judgment. Most defendants, by contrast, generally choose either to pay a certain settlement amount to the plaintiff or to gamble that further litigation will reduce the amount they must pay. Thus, plaintiffs generally choose between options that appear to be gains, while

unwilling to take a bet which is actuarially fair." Kenneth J. Arrow, *The Theory of Risk Aversion*, in *ESSAYS IN THE THEORY OF RISK-BEARING* 90, 90 (1971).

⁹¹ See, e.g., Tversky & Kahneman, *Advances*, *supra* note __, at 306. A risk-seeker will reject "a sure thing in favor of a gamble of lower or equal expectation." Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 *AM. PSYCHOL.* 341, 342-44 (1984).

⁹² Note that these risk preferences tend to shift when people confront low-probability gains and losses. That is, people tend to make risk-seeking choices when selecting between options that appear to be low-probability gains and risk-averse choices when selecting between options that appear to be low-probability losses. For example, when choosing between a definite \$25 prize and a 5% chance at winning a \$500 prize, people tend to make the risk-seeking choice by opting for the gamble. When choosing between paying a certain \$25 fine and facing a 5% chance at having to pay a \$500 fine, people tend to make the risk-averse choice by opting to make the certain, small payment. See Tversky & Kahneman, *Advances*, *supra* note __, at 306.

⁹³ See Frederick, *supra* note __, at 34..

⁹⁴ Jeffrey J. Rachlinski, *Gains, Losses, and the Psychology of Litigation*, 70 *S. CAL. L. REV.* 113, 129 (1996) [hereinafter Rachlinski, *Gains*].

⁹⁵ This pattern tends to reverse in frivolous or low-probability suits. See Chris Guthrie, *Framing Frivolous Litigation: A Psychological Theory*, 67 *U. CHI. L. REV.* 163 (2000).

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defendants generally choose between options that appear to be losses. Framing theory predicts that plaintiffs will often prefer settlement, i.e., the risk-averse option, while defendants will be relatively more attracted to trial, i.e., the risk-seeking option.⁹⁶ This is so even though a deliberative approach to settlement would ignore the frame because the characterization of options as gains or losses is dependent on the selection of an arbitrary reference point against which the options are compared.

Framing might lead judges playing the role of manager⁹⁷ or mediator⁹⁸ to be more inclined to urge plaintiffs than defendants to settle and to do so for amounts below the expected value of the litigation. To determine whether judges' settlement recommendations might be influenced by framing, we presented a group of judges with the following hypothetical fact pattern to evaluate:

Imagine that you are presiding over a case in which a plaintiff has sued a defendant for \$200,000 in a copyright action. Both the plaintiff and the defendant are mid-sized publishing companies with annual revenues of about \$2.5 million per year. They are represented by competent attorneys who have not tried cases before you in the past. You believe that the case is a simple one, but it presents some tough factual questions. There is no dispute as to the dollar 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 percent chance of recovering the full \$200,000 and a 50 percent 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.⁹⁹

We then asked the judges to indicate whether they thought the parties should settle the case. Some of the judges reviewed the case from the plaintiff's perspective: "You have learned that the defendant intends to offer to pay the plaintiff \$60,000 to settle the case. Do you believe that the

⁹⁶ See Rachlinski, *Gains*, *supra* note __, at 118-19. For more work on framing in litigation, see ROBIN M. HOGARTH, *JUDGEMENT AND CHOICE* 105 (2d. ed 1987); Babcock et al., *supra* note __; Robin M. Hogarth, *Ambiguity and Competitive Decision Making: Some Implications and Tests*, 19 *ANNALS OPERATIONS RES.* 31, 38-41 (1989); Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 *MICH. L. REV.* 107, 129-42 (1994); Peter J. van Koppen, *Risk Taking in Civil Law Negotiations*, 14 *LAW & HUM. BEHAV.* 151 (1990).

⁹⁷ On managerial judging, see Judith Resnik, *Managerial Judges*, 96 *HARV. L. REV.* 376 (1982).

⁹⁸ On judicial participation in settlement, see Marc Galanter & Mia Cahill, 'Most Cases Settle': *Judicial Promotion and Regulation of Settlements*, 46 *STAN. L. REV.* 1339 (1994).

⁹⁹ Guthrie, Rachlinski & Wistrich, *Judicial Mind*, *supra* note __, at 796.

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plaintiff should be willing to accept \$60,000 to settle the case?”¹⁰⁰ The other judges reviewed the case from the defendant’s perspective: “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?”¹⁰¹

In both instances, the judges confronted proposed settlement offers that exceeded the expected judgment at trial by \$10,000.¹⁰² Nevertheless, from the plaintiff’s perspective, both options looked like gains.¹⁰³ From the defendant’s perspective, however, both options looked like losses.¹⁰⁴ We hypothesized that the judges evaluating the case from the plaintiff’s perspective would be more likely to recommend settlement than those judges looking at it from the defendant’s perspective, even though, from a rational perspective, settlement should appear equally attractive to judges in both groups.

Our results supported this hypothesis that judges are affected by frame. Among the judges evaluating the case from the plaintiff’s perspective (gains), 39.8% indicated that they thought the plaintiff should accept the \$60,000 settlement offer, but only 25% of the judges evaluating the case from the defendant’s perspective (losses) indicated that they thought the defendant should pay the \$140,000 settlement payment proposed by the plaintiff.¹⁰⁵

At the same time, the results reveal a much smaller effect of frame on judges than has been observed on other groups. The manipulation of the decision frame shifted the judges’ preferences by only 15 percentage points; the majority favored settling in both conditions. Framing can produce large shifts in preferences of fifty percentage points.¹⁰⁶ In fact, when one of us gave the same

¹⁰⁰ *Id.* at 796-97.

¹⁰¹ *Id.* at 797.

¹⁰² *See* notes ___, *infra*.

¹⁰³ The plaintiff faced a choice between a certain \$60,000 gain through settlement or an expected trial outcome of \$50,000 (i.e., 50% x \$200,000 judgment + 50% x \$0 judgment - \$50,000 attorney’s fees = \$50,000). Guthrie, Rachlinski & Wistrich, *Judicial Mind*, *supra* note ___, at 797.

¹⁰⁴ The defendant faced a choice between a certain \$140,000 loss through settlement or an expected trial outcome of a \$150,000 loss (i.e., 50% x -\$200,000 judgment + 50% x \$0 judgment - \$50,000 attorney’s fees = -\$150,000). *Id.*

¹⁰⁵ *Id.* For more evidence that judges make intuitive decisions when evaluating figures that could be characterized either as gains or losses, see Rachlinski, Guthrie & Wistrich, *supra* note ___.

¹⁰⁶ Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 AMER. PSYCHOL. 341, 343-44 (1984).

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problem as we gave to judges to law students, we observed a shift of 46 percentage points.¹⁰⁷ The judges, while expressing some vulnerability to the influence of frame, also demonstrated a good deal of resistance to its effects in comparison to other groups.

3. Intuitive Judging – Hindsight

The third and final example of intuitive judicial decision making comes from studies of the “hindsight bias.”¹⁰⁸ Hindsight, as we all know, is 20/20. People have a well-documented tendency to overestimate the predictability of past events due to the hindsight bias.¹⁰⁹ Hindsight bias occurs because, upon learning of some outcome, we allow that knowledge to influence our sense of what would have been predictable rather than ignoring it and thinking through the problem deliberately.¹¹⁰

¹⁰⁷ Rachlinski, *supra* note __, at 128-29 (reporting that 77% of law students evaluating the case from the plaintiff’s perspective chose to settle, while only 31% of law students evaluating the case from the defendant’s perspective chose to settle).

¹⁰⁸ Baruch Fischhoff, *Hindsight [Does Not Equal] Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPERIMENTAL PSYCHOL.: HUM. PERCEPTIONS & PERFORMANCE 288 (1975) (first documenting the effects of hindsight bias).

¹⁰⁹ *Id.* See also 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).

¹¹⁰ See Scott A. Hawkins & Reid Hastie, *Hindsight: Biased Judgments of Past Events After the Outcomes Are Known*, 107 PSYCHOL. BULL. 311, 312-13 (1990).

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Judges usually evaluate events after the fact, so they could be vulnerable to the hindsight bias.¹¹¹ To explore whether judges would be prone to the hindsight bias, we gave participating judges a hypothetical fact pattern based on an actual case, labeled “Likely Outcome of Appeal”:¹¹²

In 1991, a state prisoner filed a *pro se* Section 1983 action in Federal District Court against the Director of the Department of Criminal Justice in his state, asserting, among other things, that the prison had provided him with negligent medical treatment in violation of Section 1983. The district court dismissed his complaint on the ground that the provision of negligent medical care does not violate Section 1983. The district court further found that the plaintiff knew his claims were not actionable because he had made similar claims several years earlier in a case that had been dismissed by the court. Thus, the district court sanctioned the plaintiff pursuant to Rule 11, ordering him to obtain the permission of the Chief Judge in the district before filing any more claims. The plaintiff appealed the district court’s decision.¹¹³

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

- “Affirmed” – “The court of appeals affirmed the district court’s decision to impose this Rule 11 sanction on the plaintiff.”¹¹⁴

¹¹¹ In one prior study, for example, Rachlinski and Kim Kamin demonstrated empirically that the hindsight bias influenced jurors’ liability determinations in a negligence case. Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post [Does Not Equal] Ex Ante: Determining Liability in Hindsight*, 19 LAW & HUM. BEHAV. 671 (1998).

In addition to negligence determinations, the hindsight bias likely influences claims of ineffective assistance of counsel (decisions a lawyer makes in the course of representing a criminal defendant can seem less competent after the defendant has been convicted); the levying of sanctions under Rule 11 of the Federal Rules of Civil Procedure (a motion or allegation seems less meritorious after a court rejects it); and assessments of the liability of corporate officers charged with making false predictions about their company’s performance (which can look like fraud after the predictions fail to come true). For applications of the hindsight bias to various legal issues, see Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 602-24 (1998) [hereinafter Rachlinski, *Hindsight*]. On hindsight bias and securities fraud in particular, see Mitu Gulati, Jeffrey J. Rachlinski & Donald C. Langevoort, *Fraud by Hindsight*, 98 NW U.L. REV. 773 (2004).

¹¹² Guthrie, Rachlinski & Wistrich, *Judicial Mind*, *supra* note ___, at 801.

¹¹³ *Id.*

¹¹⁴ *Id.* at 802.

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- “Vacated” – “The court of appeals found that the district court had abused its discretion and vacated the Rule 11 sanction against the plaintiff.”¹¹⁵
- “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.”¹¹⁶

We asked the judges in each of the groups to predict which of the three actions the court of appeals would have been most likely to take: “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)?”¹¹⁷ We then listed each of the three possible outcomes identified above.

Consistent with other research on the hindsight bias, the judges’ assessments were influenced by learning the alleged outcome. Among the judges told that the court of appeals had remanded for a lesser sanction, 38.6% asserted that they would have predicted that outcome (as compared to 7.4% and 20.4% of the judges told that the court of appeals had affirmed and vacated the sanction, respectively). Among judges told that the court of appeals had affirmed, 81.5% indicated that they would have predicted that result (as compared to only 40.4% and 27.8% of judges told that the court of appeals had ordered a lesser sanction and vacated, respectively). Finally, among judges told that the court of appeals had vacated, 51.9% indicated that they would have predicted that result (as compared to only 21.1% and 11.1% of judges told that the court of appeals had ordered a lesser sanction and affirmed, respectively).¹¹⁸ The sum of the percentage of judges in each of the three conditions who identified the outcome they were given as the “most likely to have occurred” was 172% (rather than 100%, which would have been our result had knowing the outcome had no influence).¹¹⁹ Learning an outcome clearly influenced the judges’ ex post assessments of the ex ante likelihood of various possible outcomes.¹²⁰ The intuitive notion that the past was predictable prevailed.

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ *Id.* at 802-03. (Reporting these results)

¹¹⁹ *Id.* at 803.

¹²⁰ The differences in responses among the groups are statistically significant. *Id.* at 802. *See also* note __, *supra*.

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In another study, however, we found that judges were capable of resisting the hindsight bias. In a problem implicating the Fourth Amendment,¹²¹ we randomly assigned judges to a foresight group or a hindsight group. We asked the judges in the foresight group whether they would grant a warrant to conduct a search under circumstances we described; we asked the judges in the hindsight group to rule on the admissibility of evidence gathered without a warrant under the same set of circumstances. We then compared their responses.

The judges in both groups learned that a police officer was on patrol outside a rock concert. The officer noticed a well-dressed, nervous-looking man exit a BMW and fiddle with something in the trunk of his car before he entered the concert. A half hour later, the officer noticed that one of the BMW's windows was down. Concerned that the car might be burglarized, he approached to close the window. Upon reaching the car, he "smelled something that he believed, based on a demonstration at a training session several years earlier, to be burnt methamphetamine. He looked inside the car and didn't see any drugs, but he did notice some Visine, a local map, and a couple of empty beer cans."¹²²

The judges assigned to the foresight group learned that the police officer, believing he had probable cause to conduct a search, called to request a telephonic warrant to search the trunk of the car. We asked the judges in this group to indicate whether they would issue the telephonic warrant.

The judges assigned to the hindsight group learned, by contrast, that the police officer conducted a warrant-less search of the trunk, where he found ten pounds of methamphetamine, other drug paraphernalia, and a recently fired gun (which, it turned out, had been used earlier in the day to murder a drug dealer across town). The police officer arrested the car owner, who was subsequently prosecuted. During his prosecution, his defense attorney moved to suppress the evidence, arguing that the officer did not have probable cause to search the trunk. We asked the judges in this group to indicate whether they would admit this evidence.

We found that the responses of the judges in the foresight and hindsight groups were statistically indistinguishable from one another.¹²³ In the foresight condition, 23.9% of the judges in the foresight condition indicated that there was probable cause to issue the warrant; in the hindsight condition, 27.7% of the judges found that there was probable cause to conduct the search and ruled the evidence admissible.¹²⁴

¹²¹ See Wistrich, Guthrie & Rachlinski, *supra* note ___, at 1314, 1342-43.

¹²² *Id.* at 1342.

¹²³ *Id.* at 1316.

¹²⁴ *Id.*

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Thus, in the initial hindsight bias problem described above, the judges proved susceptible to the bias, making judgments intuitively rather than deliberatively. In this second hindsight bias problem, though, the judges demonstrated resistance to the bias and appeared to make determinations deliberatively rather than intuitively. We suspect that the fact that the probable cause determination is a highly intricate, rule-bound area of law facilitates the deliberative, System 2 approach in two ways. First, there are a fairly large array of rules to apply. Probable cause has produced an intricate array of ways to sort fact patterns and decide cases and so judges need not rely on their intuition. Second, the intricacy of this area of law signals to the judge that intuition might be inconsistent with law and therefore they will need to think through the rules created by the appellate courts carefully. Just as the apparent intricacies of the second problem on the CRT and the banana-bagel problem act as a signal to avoid relying on intuition, so too might the complexities of the rules governing probable cause. Furthermore, the prospect for reversal on appeal provides added incentive to think through the problem as an instance in which one should ascertain the appropriate rules and apply them, rather than follow one's instincts.

4. Intuitive Judging – Anchoring

The final example of intuitive judicial decision making that we discuss here arises from studies of a phenomenon that psychologists call “anchoring.”¹²⁵ When making numeric estimates, people commonly rely on the initial value available to them. The initial value provides a starting point that “anchors” the subsequent estimation process.¹²⁶ People generally adjust away from the anchor, but they typically fail to do so sufficiently, giving the anchor greater influence on the final estimate than it should have. In short, “the number that starts the generation of a judgment exerts a stronger impact than do subsequent pieces of numeric information.”¹²⁷

We have found that anchoring can have an untoward influence on judicial decision making. In one study,¹²⁸ we demonstrated that a demand made at a pre-hearing settlement conference anchored judges' assessments of the appropriate amount of damages to award in the case. In that study, we presented the participating judges, whom we randomly assigned to a control group or an anchor group, with a lengthy vignette describing a civil case in which the plaintiff had suffered multiple injuries in a car accident caused by a negligent truck driver:

¹²⁵ Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1128 (1974) (identifying anchoring) [hereinafter Tversky & Kahneman, *Heuristics*].

¹²⁶ *Id.* (“[Different starting points yield different estimates, which are biased toward the initial values.]”).

¹²⁷ Fritz Strack & Thomas Mussweiler, *Heuristic Strategies for Estimation Under Uncertainty: The Enigmatic Case of Anchoring*, in FOUNDATIONS OF SOCIAL COGNITION: A Festschrift in Honor of Robert S. Wyer, Jr. 79, 80 (Galen V. Bodenhausen & Alan J. Lambert eds., 2003).

¹²⁸ See Wistrich, Guthrie & Rachlinski, *supra* note ___, at 1286-93.

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Imagine that you are presiding over an automobile accident case in which the parties have agreed to a bench trial. The plaintiff is a 31-year-old male schoolteacher and the defendant is a large package-delivery service. The plaintiff was sideswiped by a truck driven erratically by one of the defendant's drivers. As a result of the accident, the plaintiff broke three ribs and severely injured his right arm. He spent a week in the hospital, and missed six weeks of work. The injuries to his right arm were so severe as to require amputation. (He was right-handed.)¹²⁹

We informed the judges that the only remaining issue was the amount of compensatory damages due the plaintiff. We informed the judges that they had presided over an unsuccessful settlement conference. The judges in the control group learned that the plaintiff's lawyer had told them at the conference that the plaintiff "was intent upon collecting a significant monetary payment."¹³⁰ The judges in the anchor group learned that the plaintiff's lawyer had demanded \$10 million on behalf of his client. We asked the judges in both groups to indicate the amount of compensatory damages they would award the plaintiff.

The \$10 million anchor had a significant impact on the judges. In the control group, judges awarded a mean amount of \$808,000 and a median amount of \$700,000; in the anchor group, judges awarded a much larger mean amount of \$2,210,000 and a median amount of \$1 million.¹³¹ Clearly, the anchor had a significant impact on their decisions.¹³²

In another study,¹³³ we tested whether a motion to dismiss would have a similar effect on judges' damage awards. In this study, we presented the participating judges with similar materials. Half of the judges were asked simply, "how much would you award the plaintiff in compensatory damages?"¹³⁴ The other half were given the same background information, but were also told that "[t]he defendant has moved for dismissal of the case, arguing that it does not meet the jurisdictional

¹²⁹ *Id.* at 1332.

¹³⁰ *Id.*

¹³¹ *Id.* at 1290.

¹³² We also compared a control group of judges to an experimental group of judges who received a low, rather than a high, anchor, and we found an anchoring effect. *Id.* The fact that these anchors had an impact on judicial decision making in this problem is particularly striking given that information disclosed in settlement conferences is inadmissible in court and therefore inappropriate for the judges to consider at trial. *See, e.g.,* FED. R. EVID. 408 (providing, in relevant part, that "[e]vidence of conduct or statements made in compromise negotiations" is not admissible in court).

¹³³ Guthrie, Rachlinski & Wistrich, *Judicial Mind*, *supra* note ___, at 790-92.

¹³⁴ *Id.* at 790-91.

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minimum for a diversity case of \$75,000.”¹³⁵ 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?”¹³⁶ Because the plaintiff clearly had incurred damages greater than \$75,000, we viewed the motion as meritless, as did all but two of the judges who ruled on it.¹³⁷ Nonetheless, the \$75,000 jurisdictional minimum served as an anchor, resulting in lower damage awards from those judges exposed to it. The judges who had not ruled on the motion awarded the plaintiff, on average, \$1,249,000 (and a median amount of \$1 million), while the judges exposed to the \$75,000 anchor awarded the plaintiff, on average, \$882,000 (and a median amount of \$882,000).¹³⁸ The \$75,000 jurisdictional minimum anchor the judges’ judgments, as they awarded, on average, roughly \$350,000 (or nearly 30%) less.¹³⁹

Both studies of anchoring suggest that the anchor had a powerful influence on judgment in the judges we studied. This was true when the anchor was essentially unrelated to the magnitude of the claim (in the study of the effect of the motion) and when the judges knew full well that they were supposed to ignore it (in the study of the settlement talks).

5. Summary of Intuitive Judging Studies

This research suggests that judges rely heavily on their intuitive faculties. This is so not only when they confront generic problems, like the bat-and-ball, widget, and lily pad problems that make up the CRT, but also when they face the kinds of problems they generally see on the bench. When evaluating statistical evidence, assessing settlement proposals, assigning liability, predicting outcomes on appeals, and awarding damages, judges seem inclined to make intuitive judgments, allowing such stimuli as absurd settlement demands or the arbitrary characterization of options as gains or losses to influence their judgment.

But our studies also show that judges can overcome their intuitive reactions to make deliberative decisions. Our study of probable cause revealed that learning the outcome had no effect on the judges. Based on the body of research that we (and others¹⁴⁰) have conducted, the results of

¹³⁵ *Id.* at 791.

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.* at 791-92. The difference between the responses of the judges in the two groups was statistically significant. *Id.*

¹³⁹ For more evidence that judges make intuitive decisions when confronted with an anchor, see Rachlinski, Guthrie & Wistrich, *supra* note ____.

¹⁴⁰ See, e.g., Theodore Eisenberg, *Differing Perceptions of Attorney Fees in Bankruptcy Cases*, 72 WASH. U. L.Q. 979 (1994) (reporting evidence suggesting that judges are prone to the self-serving or egocentric bias); W. Kip Viscusi, *How Do Judges Think About Risk?*, 1 AMER. LAW & ECON. REV. 26, 29

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this second study are surprising.¹⁴¹ We are unaware of any evidence that judges can avoid the influences of the other two phenomena described above. Indeed, we are not aware of any group that reliably resists the hindsight bias in any context. Furthermore, even though our studies of reasoning about statistical evidence and about framing revealed judges to be vulnerable to relying on intuition, they also showed that judges resist intuition more so than other groups. All in all, then, this work suggests that judges are inclined, at least when presented with certain stimuli, to make intuitive decisions, but carry the capacity to override them with deliberative thinking.

What explains the pattern of resistance and vulnerability to intuition that we have observed in these studies? We observed strong effects of intuition in our studies of anchoring and in the study of hindsight bias on appeals, less influence on framing and statistical evidence, and no influence on the assessment of probable cause.¹⁴² These differences reveal much concerning the model that we are proposing. The anchoring studies both request an estimate for a damage award in fairly nebulous, impressionistic context—that of assessing pain and suffering. Furthermore, our materials provided far less information than a judge would have in an actual case, thereby perhaps inducing the judges to rely on their intuition more so in our research than when making decisions on the bench. The other problems all suggest that something other than intuition is available to rely upon. The statistical problem provides numeric cues as does the framing problem. As noted, the probable cause problem ushers the judge into a rule-bound inquiry, while the appeals problem does not and thus produces results much more like the anchoring problems. The judges seized upon the cues to rely on deliberation that some of the problems present.

Despite this account, the results of this research are somewhat surprising. Our study of judges and the CRT shows that they score fairly well on the test, suggesting a strong ability to resist

(1999) (finding that “judges exhibit a variety of biases”);

¹⁴¹ *But see* Rachlinski, Wistrich & Guthrie, *supra* note __ (finding, despite evidence of susceptibility to anchoring and framing, that bankruptcy judges appeared uninfluenced by omission bias and some emotional factors); Viscusi, *supra* note __, at 46-55 (finding, among judges attending a law and economics conference, little evidence of hindsight bias).

¹⁴² Even in the anchoring and hindsight study of appeals, the fact that we generally observed statistically significant differences between the control group judges and experimental group judges in our studies does not mean that every judge made intuitive decisions. Take, for example, the anchoring studies described above. In those studies, we found that the group of judges exposed to an anchor responded differently from the group of judges not exposed to that anchor. This does not mean that every judge in the anchor group made an intuitive judgment; indeed, some judges in the anchor group resisted the influence of the anchor and responded the same way as the judges in the control group (just like some judges who took the CRT overcame their intuitive reactions on one, two, or all of three of the problems). Our results only show that as a group, the judges were influenced by their intuition heavily; they do not tell us which judges were influenced and by how much.

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intuitions. True, they did not score as well as the engineers and scientists that wander the halls of MIT, but they scored among the country's best undergraduates. The judges' ability to avoid highly intuitive responses on some of the problems also suggests that they often use this ability in a legal context. Still, the pull of untoward intuition on the judges was strong, both in the CRT study and in our other research. Both intuitive and deliberative strains are evident in the judges, just as the dual-process models in psychology predict.

III. IMPLICATIONS FOR THE JUSTICE SYSTEM

Building on recent work in decision theory, we have proposed an intuitive-override model of judging that is less idealistic than the "deductive" model embraced by the formalists and others, but less cynical than the "intuitive" model embraced by the realists. The results on the CRT suggest that judges, like the rest of us, possess two parallel systems for making judgments: an intuitive System 1, and a deliberative System 2. Both operate at the same time and can produce different results. System 1 being faster, judges must decide whether intuition is adequate, or whether they should take a more deductive approach.

The results of our research show that intuition is a powerful influence on judgment. With respect to the CRT, we found that the judges, on balance, performed like other groups of well-educated adults, which is to say, they made judgments largely based on intuition. The legal scenarios we have run also demonstrate the hold intuition has over judges' judgement. But, as the CRT scores also show, many judges have the cognitive skills to resist intuition when it would lead them astray. And some contexts facilitate the deliberative process that the CRT result show judges possess, allowing judges to overcome their intuitive reactions to decide matters deliberatively. Together, these results provide support for our model, suggesting that judges are predominantly intuitive but capable of rejecting intuition in favor of deliberation in some circumstances.

Given the central role judges play in the justice system, both inside and outside of court,¹⁴³ it is critically important to the operation of the system that we understand how judges make decisions. Only if we understand judicial decision making can reforms and revisions to justice system be crafted that meet the needs of litigants and society. Our model, which views judges as predominantly intuitive but occasionally deliberative decision makers, raises two critical questions

¹⁴³ As we have observed in earlier work:

In the day-to-day operation of the legal system, judges are much more important than juries. They decide roughly as many cases at trial as juries do, they determine the outcome of roughly seven times as many cases as juries by ruling on dispositive motions, and they often play an active role in settling cases. Even in those cases that juries decide, judges preside. They determine what evidence juries will be allowed to hear and interpret and instruct juries on the law they are to apply.

Guthrie, Rachlinski & Wistrich, *Judicial Mind*, *supra* note __, at 781.

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for the system: First, which decision making approach – intuitive or deliberative – is more likely to lead to just outcomes? We note that intuition can be adaptive, but on balance, we believe deliberation is more likely to lead to just outcomes, as we explain below. Second, given our response to the first question, what kinds of aspects of the justice system encourage judges to make deliberative rather than intuitive decisions? In effect, what kinds of situations trigger deliberative processing? Below, we identify several concrete steps that the system might take.

A. Intuitive versus Deliberative Decision Making

The intuitive approach to decision making, as we have seen, is quick, effortless, and easy, while the deliberative approach to decision making is slow, effortful, and complex. The obvious advantage to the former approach is its speed, enabling judges with heavy dockets to make judgments quickly. The obvious advantage to the latter approach is the care it entails, suggesting, perhaps, that deliberative judgments are more likely to be accurate and just. Is this so?

Intuitive judgments are often quite good. As Kahneman, and his long-time collaborator, Amos Tversky, observed in their early work on heuristics, intuitive thinking is “quite useful” and can often lead to good outcomes.¹⁴⁴ More generally, Gerd Gigerenzer and his colleagues have developed a research program devoted to demonstrating that intuitive thinking can, with “a minimum of time, knowledge, and computation,” enable decision makers “to make adaptive choices in real environments.”¹⁴⁵ And recent research on experts suggest that they, in particular, use intuitive thinking successfully. Consider, for example, the enormous body of research on chess grandmasters, who routinely use intuitive rather than deliberative strategies to great effect:

[T]he expert relies not so much on an intrinsically stronger power of analysis as on a store of structured knowledge. When confronted with a difficult position, a weaker player may calculate for half an hour, often looking many moves ahead, yet miss the right continuation, whereas a grandmaster sees the move immediately, without consciously analyzing anything at all.¹⁴⁶

¹⁴⁴ Tversky & Kahneman, *Heuristics*, *supra* note __, at 1124.

¹⁴⁵ Gerd Gigerenzer & Peter M. Todd, *Fast and Frugal Heuristics: The Adaptive Toolbox*, in *SIMPLE HEURISTICS THAT MAKE US SMART* 3, 14 (Gerd Gigerenzer, Peter M. Todd & the ABC Research Group eds., 1999). For more on the “fast and frugal” heuristics program, see the other contributions in *Simple Heuristics That Make Us Smart* as well as *BOUNDED RATIONALITY: THE ADAPTIVE TOOLBOX* (Gerd Gigerenzer & Reinhard Selten eds., 2002) [hereinafter *ADAPTIVE TOOLBOX*]. In fact, Gigerenzer argues that fast, heuristics are superior to deductive reasoning. See Epstein, *supra* note __, at 719-20 (cataloguing various ways in which the “experiential” system can outperform the “rational” system). Ever the contrarian, however, Gigerenzer largely rejects the dual process models, arguing that the important distinction lies between simple decision rules (intuitive or deliberative) and computational approaches to decision making.

¹⁴⁶ Philip E. Ross, *The Expert Mind*, 295 *SCI. AM.* 64, 67 (2006). See also ADRIAAN DE GROOT, *THOUGHT AND CHOICE IN CHESS* (1978) (author of the classic study); Kahneman & Frederick, *supra* note

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As discussed early Malcolm Gladwell’s popular book, *Blink*, shows that in many contexts, intuition can be superior to deliberation. Furthermore, Haidt’s work shows that intuition is the dominant way people make certain judgments. If so, then, as Schooler’s research suggests, inducing people to deliberate might just make judgment worse.

Nevertheless, there is reason to be suspicious of intuitive decision making in court. As Tversky and Kahneman observe, intuitive thinking, though sometimes useful,¹⁴⁷ can “lead to severe and systematic errors.”¹⁴⁸ Consider, by way of example, the work reported above. On the CRT, the judges who responded intuitively made inaccurate choices. On the judicial decision making problems, which are obviously more relevant to appraising the relative merits of intuition versus deliberation in court, judges who employed intuitive thinking allowed their damage awards to be significantly influenced by an irrelevant settlement demand; allowed their settlement recommendations to be influenced by whether options appeared to be gains or losses; and, in at least one instance, allowed outcome information to influence their assessments of the ex ante predictability of some behavior. Furthermore, about half of the judges made an intuitive misinterpretation of statistical evidence. In these instances, intuitive, heuristic-based decision making led the judges to make erroneous and unjust decisions that they likely would have avoided had they adopted a deliberative approach.

Moreover, the capacity to use intuitive thinking successfully requires years of “effortful study”¹⁴⁹ as well as accurate and reliable feedback on earlier judgments. In contrast to chess grandmasters, judges are unlikely to obtain accurate and reliable feedback on the vast majority of

___, at 51 (“Although System 1 is more primitive than System 2, it is not necessarily less capable. On the contrary, complex cognitive operations eventually migrate from System 2 to System 1 as proficiency and skill are acquired. A striking demonstration of the intelligence of System 1 is the ability of chess masters to perceive the strength or weakness of chess positions instantly.”); Gary Klein, *The Fiction of Optimization*, in ADAPTIVE TOOLBOX, *supra* note ___, at 103, 115-16 (describing the “progressive deepening” strategy that expert chess players use rather than traditional decision analysis); Tom Mueller, *Your Move*, THE NEW YORKER, Dec. 12, 2005, at 62, 64 (“Experienced players rely on subconscious faculties known variously as pattern recognition, visualization, and aesthetic sense. All are forms of educated guesswork—aids to making choices when certainty through exhaustive calculation is impossible—and may be summed up in a word: intuition. Even a novice player uses intuition to exclude most moves as pointless, and the more advanced a player becomes the less he needs to calculate.”). More generally, research suggests that “[e]xperts notice features and meaningful patterns of information that are not noticed by novices.” COMMITTEE ON DEVELOPMENTS IN THE SCIENCE OF LEARNING, HOW PEOPLE LEARN: BRAIN, MIND, EXPERIENCE, AND SCHOOL 31 (2000).

¹⁴⁷ See text accompanying note ___, *supra*.

¹⁴⁸ Tversky & Kahneman, *Heuristics*, *supra* note ___, at 1124.

¹⁴⁹ See generally THE CAMBRIDGE HANDBOOK OF EXPERTISE AND EXPERT PERFORMANCE (K. Anders Ericsson, Paul J. Feltovich, Robert R. Hoffman & Neil Charness eds., 2006).

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judgments they make; indeed, only in those rare cases where they are challenged on appeal¹⁵⁰ are they likely to receive external validation (or invalidation) of the accuracy of their judgments.¹⁵¹ Even then, the appeals process is an unreliable source of feedback; most cases settle before the appeal is decided, appeals themselves take years, and the outcomes are often clouded by collateral policy concerns. Not surprisingly, then, we found no differences in CRT performance based on experience or length of service. Thus, it seems unlikely that judges, in contrast to chess grandmasters, can perfect their intuitive or System 1 decision making processes.

Furthermore, the intuitive system conflicts with the values that underlie democratic legal systems. Unlike deliberative decisions, intuitive ones are not transparent. System 1 is fundamentally a non-verbal system that produces choices that are hard, or even impossible, to explain accurately. Even if the decision maker tries to explain an intuitive choice, because the factors that influence an intuition lie beyond the conscious access of a decision maker, the explanations are apt to be unreliable.¹⁵² Even if some legal decisions are more accurate when made intuitively, the greater accuracy might come at the cost of transparency.

Intuition is also the likely pathway by which undesirable influences like the race, gender, or attractiveness of parties affect the legal system.¹⁵³ We believe that the overwhelming majority of judges in America today explicitly reject the idea that these factors should influence litigants' treatment in court. Nevertheless, even people who embrace an egalitarian ideology still harbor

¹⁵⁰ See, e.g., C.K. ROWLAND & ROBERT A. CARP, *POLITICS & JUDGMENT IN FEDERAL DISTRICT COURTS* 8 (1996) (observing that “only about 20 percent of all district court cases are appealed in any given year”); Theodore Eisenberg, *Appeal Rates and Outcomes in Tried and Nontried Cases: Further Exploration of Anti-Plaintiff Appellate Outcomes*, 1 J. EMPIRICAL LEGAL STUD. 659, 685 (“About 20 percent of cases with definitive trial court judgments generate appeals, with tried cases appealed at about twice the rate of nontried cases.”).

¹⁵¹ Even when cases are appealed, trial judges are unlikely to receive good feedback because many of the appeals will settle before an appellate court rules and because the standards of review require appellate courts to give deference to trial judges on many of their discretionary decisions. See, e.g., Margaret A. Berger, *When, If Ever, Does Evidentiary Error Constitute Reversible Error?*, 25 LOY. L.A. L. REV. 893, 894-96 (1992) (finding in 1990 that only 30 trial verdicts were reversed for evidentiary error in the federal courts); Maurice Rosenberg, *Standards of Review*, in *RESTRUCTURING JUSTICE: THE INNOVATIONS OF THE NINTH CIRCUIT AND THE FUTURE OF THE FEDERAL COURTS* 30, 31 (Arthur D. Hellman ed., 1990) (explaining that in many instances “the court of appeals [is] obliged by established standards to affirm unless, for example, crucial fact findings were not merely in error but clearly so,” and, likewise, that “[d]iscretionary rulings [have] to be not merely incorrect, but abusive”).

¹⁵² See Richard E. Nisbett & Timothy D. Wilson, *Telling More than We can Know: Verbal Reports on Mental Processes*, 84 PSYCHOL. REV. 231 (1977).

¹⁵³ See Christine Jolls & Cass Sunstein, *The Law of Implicit Bias*, – CAL. L. REV. – (forthcoming 2006) (describing how race operates as a System 1 influence on judgment).

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invidious mental associations¹⁵⁴ For example, most white adults associate African-Americans with weapons and violence more so than with white Americans, and associate men with professional careers and women with family life.¹⁵⁵ These associations seem to effect automatic, intuitive judgments.¹⁵⁶ Active deliberation, by contrast, reduces the effect of these invidious associations.¹⁵⁷ Inviting more intuitive judgments thus invites undesirable influences on judgment.

Judges might well use intuition to good advantage in some circumstances. Nevertheless, we believe that a deliberative approach to judging, which judges sometimes employ, is less likely to lead to decision making error and more likely to lead to just outcomes.

B. Inducing Deliberation

If deliberation is the preferred system for judges, then it should be encouraged. Our model does not identify specific reforms—it is too general for that. Most aspects of any legal system are what they are for many reasons, and efforts to encourage deliberation are but one part of an intricate system that balances many factors. Our goal here is simply to identify factors that support or undermine judges’ efforts to suppress intuition and embrace deliberation. But what aspects of the legal system encourage judges to override their intuitive systems?

Researchers have determined that the decision-making approach one employs depends largely (and not surprisingly) on “features of the task and of the individual.”¹⁵⁸ Some of these features are largely beyond the system to address, such as a judge’s cognitive ability to suppress intuition.¹⁵⁹ We are not suggesting that judicial nomination committees administer the CRT to all candidates. We suspect, however, that such committees at both the state and federal level search for evidence of good deliberative skills in their judicial candidates. The CRT might be a better gauge of such skills than a face-to-face interview.

Judges’ mood at the time of decision making also presents an interesting source of concern that our model highlights. Research indicates that mood can have a profound effect on judgment.¹⁶⁰

¹⁵⁴ See Jerry Kang, *The Trojan Horses of Race*, 118 HARV. L. REV. 1489, 1506-1514 (2005) (reviewing the evidence on implicit invidious associations).

¹⁵⁵ See *id.*

¹⁵⁶ See Jolls & Sunstein, *supra* note __.

¹⁵⁷ See *id.*

¹⁵⁸ Kahneman & Frederick, *supra* note __, at 51.

¹⁵⁹ See Stanovich & West, *supra* note __.

¹⁶⁰ See Alice M. Isen, Thomas E. Nygren & F. Gregory Ashby, *Influence of Positive Affect on the Subjective Utility of Gains and Losses: It Is Just Not Worth the Risk*, 55 J. PERSONALITY & SOCIAL PSYCHOL. 710 (1988).

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Positive moods are associated with creative, thoughtful decisionmaking, while negative affect can produce low-quality, knee-jerk intuition.¹⁶¹ As with administering the CRT, we are not adopting a bizarre suggestion here, such as administering Prozoac to unhappy judges. But we cannot help but express some concern over the unfortunate defendant's sentencing hearing happens to occur just a after a judge has a heated argument with a spouse. Their ability to suppress intuition might be at a low ebb, and such a judge might do well to consider postponing the hearing.

More generally, judges who face "cognitive overload,"¹⁶² perhaps due to heavy dockets,¹⁶³ or who have limited time within which to make judgments,¹⁶⁴ are more likely to make intuitive rather than deliberative decisions because intuitive decisions are speedier and easier. As many of the judges we have studied candidly admit, time pressures present an enormous challenge. Judges know that limited time can make for bad decision making, and commonly express concern that they lack enough time to conduct research or read the attorney's briefs. Our intuitive-override model makes it clear that time pressure has a hidden cost in that it induces greater reliance on intuition. No easy cure for time pressure exists. Even expanding (and filling) the number of judgeships, or expand the number of magistrates to whom certain judicial decision making tasks are delegated, is no cure. The courts are already so congested that they are like highways in that adding more space does not reduce crowding. Adding more judgeships makes litigating more attractive to those who would otherwise find alternative ways of resolving their disputes (just as adding more highways makes driving more attractive to those who would otherwise find alternative means of transportation).¹⁶⁵ Only judges themselves can insist that they have the time available to engage their deliberative systems, even if this means that disputes that are filed take longer to adjudicate.

¹⁶¹ See *id.* (for a review)

¹⁶² See, e.g., BARRY SCHWARTZ, *THE PARADOX OF CHOICE: WHY MORE IS LESS* (2004) (exploring various ways in which the availability of lots of options and information can compromise the quality of decision making). See also Chris Guthrie, *Panacea or Pandora's Box? The Costs of Options in Negotiation*, 88 IOWA L. REV. 601, 625-34 (2003) (exploring this in the context of negotiation decision making).

¹⁶³ See, e.g., Marc Galanter, *The Vanishing Trial: An Examination of Trials and Related Matters in Federal and State Courts*, 1 J. EMPIRICAL LEGAL STUD. 459, 461, 462 tbl.2 (2004) (observing a five-fold increase in dispositions in federal courts from 1962-2002).

¹⁶⁴ See, e.g., Melissa L. Finucane, Ali Alhakami, Paul Slovic, and Stephen M. Johnson, *The Affect Heuristic in Judgments of Risks and Benefits*, 13 J. BEHAVIORAL DECISION MAKING 1, 5-8 (2000) (finding that subjects were more likely to rely on intuitive, heuristic-driven decision making rather than deliberative decision making when operating under time pressure).

¹⁶⁵ On this risk, see Tracey E. George & Chris Guthrie, *Induced Litigation*, 98 NW. U. L. REV. 545 (2004).

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Building on that observation, our model suggests that evidentiary rulings at trial are apt to be more troublesome than those made *in limine*. At trial, the judge is time pressured, and often will have little choice but to engage System 1 thinking. Our model suggest that important evidentiary rulings be heard *in limine* or at the very least after a recess and some time for the judge to engage deliberative System 2 thinking.

Similarly, our intuitive-override model provides some reason to be suspicious of oral arguments. During oral arguments, even the best prepared judges will have to “think on their feet”, and rely on rapid, intuitive reactions to the debate unfolding before them. Any change in a judge’s opinion that oral argument produces might well be the product of the influence of System 1 thinking. Lawyers who senses that the judge has ruled against them “on paper” are apt to try to use the opportunity of an oral argument to change the judge’s mind, of course. And given the nature of oral arguments, this effort might largely consist of efforts to trigger new intuitions in the judge. Judges can cabin this influence, however, by limiting oral arguments to the resolution of a few well-defined issues. Many judges, in fact, use oral argument to address a few specific questions raised by the briefs and probably very few enter oral arguments not having some idea of what issues will determine their ruling.

Expanding on this point, the adversarial nature of American litigation might affect judges’ ability to override their intuition with deliberation. At least one party is apt to benefit from an intuitive approach and try to present their materials in a way that triggers System 1 processing. For example, defendants tend to benefit from the influence of frame on judges (in that frame makes lower settlement offers seem more sensible). In contrast, plaintiffs tend to benefit from the hindsight bias (in that the bias makes the failure to have taken precautions seem more unreasonable). And if one source of intuition is not favorable, then a party will likely try to present another to the judge. Sorting through competing arguments might require deliberative thinking. At the very least, the presence of competing arguments can reveal that simple intuition will not produce a defensible decision. Just as the uneven numbers in the bread-and-bagel problem trigger the need for deliberation, so too might the competing arguments.

One step that could increase the likelihood that judges will make deliberative and rational decisions is to devote more resources to judicial training. Several studies suggest that statistical training in particular, though certainly not a panacea,¹⁶⁶ nonetheless increases the likelihood that individuals will make rational, deliberative decisions rather than intuitive, heuristic-driven decisions.¹⁶⁷ As we have argued in previous work, training might be best arranged to address

¹⁶⁶ See, e.g., Amos Tversky & Daniel Kahneman, *Belief in the Law of Small Numbers*, 76 PSYCHOL. BULL. 105 (1971) (finding evidence of intuitive and heuristic-driven thinking among mathematically oriented psychologists).

¹⁶⁷ See, e.g., GERD GIGERENZER, CALCULATED RISKS 229-46 (2002) (exploring how the population can be taught to understand risk information); Franca Agnoli, *Development of Judgmental Heuristics and Logical Reasoning: Training Counteracts the Representativeness Heuristic*, 6 COGNITIVE DEVELOPMENT 195 (1991) (providing evidence showing that statistical training improved the reasoning

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specific System 1 influences. For example, judges might be taught to address the framing problem by learning to re-frame alternatives. Any option that is cast as a loss can usually also be characterized as a gain. Seeing a dispute in both ways can reduce the effects of framing and thus represents a useful deliberative mechanism for combating the intuitions that framing produces. Specific techniques such as this, tied to specific legal settings, probably reflects one of the best ways to combat the effects of intuition on judging because they give judges a way to recognize the circumstances that otherwise can quietly induce intuitive thinking.

Beyond training judges, procedural steps can limit judges' exposure to stimuli that are likely to trigger intuitive thinking. There are several ways that this might be done, but the one we think most promising is for courts to implement "divided decision making," as illustrated with the following example. Consider the first anchoring study described above, in which a preposterous \$10 million demand made at a settlement conference subsequently influenced judges' damage awards.¹⁶⁸ By dividing decision making between judges (e.g., assigning managerial functions to one judge and adjudicative functions to another) or between judge and jury (i.e., judge exposed to the anchor during settlement, but jurors are not), the system could prevent an anchor like a settlement demand from influencing judges' damage determinations. More generally, this divided decision making strategy is likely to shield the ultimate adjudicator from various stimuli that are likely to induce intuitive, heuristic-based decision making. There are, of course, some impediments to implementing divided decision making. For example, litigants are entitled to jury trials in only certain cases. And, perhaps more significantly, the costs of some forms of divided decision making, like increased jury trials, could be quite high. Still, this approach has much to recommend it.

In short, there are numerous ways in which judges can make it more likely that they will make deliberative decisions. They tend to make decision making more costly, and some, such as divided decision making, might be sufficiently cumbersome that they are not worth the extra time. Our task here is to identify the benefits of these suggestions that our model of judging inspires.

CONCLUSION

abilities of children); Franca Agnoli & David H. Krantz, *Suppressing Natural Heuristics by Formal Instruction: The Case of the Conjunction Fallacy*, 21 *COGNITIVE PSYCHOL.* 515 (1989) (providing evidence showing that statistical training improved the reasoning abilities of adult subjects with limited prior exposure to mathematics); Richard P. Larrick, James N. Morgan & Richard E. Nisbett, *Teaching the Use of Cost-Benefit Reasoning in Everyday Life*, 1 *PSYCHOL. SCI.* 362 (1990) (showing that cost-benefit training improved decision making); Richard E. Nisbett, David H. Krantz, Christopher Jepson & Ziva Kunda, *The Use of Statistical Heuristics in Everyday Inductive Reasoning*, 90 *PSYCHOL. REV.* 339 (1983) (identifying several ways in which statistical training can improve the intuitive reasoning people generally employ).

¹⁶⁸ See text accompanying notes __, *supra*.

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We believe that most judges attempt to “reach their decisions utilizing facts, evidence, and highly constrained legal criteria, while putting aside personal biases, attitudes, emotions, and other individuating factors.”¹⁶⁹ Despite their best efforts, however, judges, like everyone else, carry two cognitive systems for making judgments, operating in parallel. The intuitive system is apt to have a powerful effect on judgment. As our data suggest, judges make many decisions in a predominantly intuitive way. And yet judges are capable of overriding their intuitive reactions and making more deliberative judgments. The predominately intuitive approach might work satisfactorily in many cases, but it can lead to erroneous, and unjust, outcomes.

Assuming the model of judging we propose is accurate – and, needless to say, additional research employing divergent methods is necessary to establish this – the legal system should take what steps it can to increase the likelihood that judges will overcome their intuitive reactions and decide cases in a predominately deliberative way. Deliberation, not intuition, is the path to justice.

¹⁶⁹ Donald C. Nugent, *Judicial Bias*, 42 CLEV. ST. L. REV. 1, 4 (1994). For a more disconcerting take on judicial performance, see Geoffrey P. Miller, 83 TEX. L. REV. 431 (2004).