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JUDICIAL DECISION-MAKING FROM AN EMPIRICAL PERSPECTIVE

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ABSTRACT

The traditional theories of judicial decision-making have their differences set around the importance of logical, rule-bound, and step-by-step reasoning. For legal formalists,

judicial decision-making is predominantly a logical and rule-bound process, and ideally it is a product of syllogistic reasoning. For original legal realists and their contemporary counterparts, judicial decision-making is rarely a logical, step-by-step, and rule-bound process; more often than not, it is better epitomized by intuitive decisions. For a long time this question remained open. The purpose of this article is accordingly twofold. First, by relying on empirical research on decision-making, we argue that logical and rule-bound judicial decision-making, although possible in theory, is highly unlikely in practice. Second, by relying on indirect empirical evidence, we show that judges are very likely to possess unexceptional decision-making skills even when it comes to aspects of decision-making that have not been specifically tested on judges.

KEYWORDS

Judicial decision-making, legal realism, heuristics & biases, intuitive decision-making, expert Judgment

INTRODUCTION

What is the role of rule-based, logical, step-by-step thinking in judicial decision-making? This question has been at the center of many jurisprudential debates for almost a century now. Before the rise of Legal Realism, the prevailing view was that judicial decision-making consists of the logical application of legal rules to the facts of the case. For many contemporary legal formalists, judicial decision-making is still best epitomized by logical, rule-based thinking.[1]

In the 1920s, the legal realists challenged this view.[2] Max Radin, for example, argued that judges do not process information logically but make instant and intuitive decisions in response to clusters of fact situations (the so-called situation type of judging).[3] Hutcheson, a federal judge, also famously argued that judges use "hunches" or intuitive decision-making first, and only then use logical thinking to come up with justifications for their preferred outcome.[4] Thus, according to the legal realist model, judicial decision-making is an intuitive process, where step-by-step rule-bound reasoning is secondary.

Legal Realism, as a self-identified movement, faded away after a few decades and its place was later taken by other jurisprudential schools, such as Critical Legal Studies or economic analysis of law. However, the question remained controversial whether judicial decision-making is primarily a logical and rule-bound thinking process.

In the last few decades, general empirical research on decision-making has blossomed. Some of the empirical research has also been carried out on judges. Accordingly, the purpose of this article is twofold. First, by synthesizing empirical

[1] Judge Posner thus describes the formalistic ideal:
"The ideal legalist decision is the product of a syllogism in which a rule of law supplies the major premise, the facts of the case supply the minor one, and the decision is the conclusion. The rule might have to be extracted from a statute or a constitutional provision, but the legalist model comes complete with a set of rules of interpretation (the "canons of construction"), so that interpretation too becomes a rule-bound activity, purging judicial discretion" (Richard A. Posner, *How Judges Think* (Cambridge: Harvard University Press, 2008), p. 41).

[2] There is more to legal realism than just an idea that judicial decision-making is not the rule-bound but rather the intuitive process. Overall, the legal realists had two general theses. First, judges have a preferred outcome of the case even before they turn to legal rules; that preferred outcome is usually based on some non-legalistic grounds, like conceptions of justice, attributes of litigating parties (government, poor plaintiff, racial group, etc), ideology, public policy preferences, judge's personality, etc. Second, judges usually will find a justification in formal legal rules for their preferred outcome; this is possible because the legal system is complex and often contradictory (*see generally* Vitalius Tumonis, "Legal Realism & Judicial Decision-making," *Jurisprudence* 19(2012); Frederick Schauer, *Thinking Like a Lawyer: A New Introduction to Legal Reasoning* (Cambridge: Harvard University Press, 2009), p. 138; Brian Leiter, "Positivism, Formalism, Realism," *Columbia Law Review* 99 (1999): 1138; Brian Z. Tamanaha, *Beyond the Formalist-Realist Divide* (Princeton: Princeton University Press, 2010)).

[3] Max Radin, "The Theory of Judicial Decisions: Or How Judges Think," *American Bar Association Journal* 11 (1925). In his subsequent writings, Radin observed that many factors influence how judges classify situations of facts: legal training, judicial philosophy, conscious and unconscious prejudices and even chance (*see* Max Radin, "Legal Realism," *Columbia Law Review* 31 (1931)).

[4] Joseph C. Hutcheson, Jr., "The Judgment Intuitive: The Function of the 'Hunch' in Judicial Decision," *Cornell Law Journal* 14 (1929).

evidence, we show that logical and step-by-step decision-making, although possible in theory, is highly unlikely in real-world judicial decision-making. Second, by relying on indirect empirical evidence, we argue that even when it comes to areas of decision-making that have not been specifically tested on judges, distinctive expert judgment is highly unlikely and thus judges are very likely to possess unexceptional decision-making skills.

1. RULE-BASED THINKING VS. INTUITIVE THINKING

1.1. INTRODUCTION TO DUAL-SYSTEM THEORIES

One of the most significant findings to emerge from contemporary empirical research is that there are two distinct systems underlying human reasoning and decision-making.[5] First, there is an evolutionarily old system that is automatic, unconscious, fast, associative, and parallel. Second, there is a more recent system that is rule-based, controlled, conscious, serial, and slow.

Perhaps the most influential dual-process theory is the System1/System2 distinction.[6] The following table summarizes the main differences between the two systems:[7]

[5] The idea that there are two different models of reasoning and decision-making is old. Descartes distinguished between intuition and deduction. Pascal distinguished between "intuitive" mind and "geometric" mind (Chris Guthrie, Jeffrey J. Rachlinski, and Andrew J. Wistrich, "Blinking on the Bench: How Judges Decide Cases," *Cornell Law Review* 93 (2007): 6; *see also* Keith Frankish and Jonathan St. B. T. Evans, "The Duality of Mind: An Historical Perspective"; in: Jonathan Evans and Keith Frankish, eds., *In Two Minds: Dual Processes and Beyond* (Oxford: Oxford University Press, 2009)).

[6] System1/System2 distinction has been formulated by a Nobel laureate Daniel Kahneman and Shane Frederick (Daniel Kahneman and Shane Frederick, "Representativeness Revisited: Attribute Substitution in Intuitive Judgment"; in: Thomas Gilovich, Dale Griffin, and Daniel Kahneman, eds., *Heuristics and Biases: The Psychology of Intuitive Judgment* (Cambridge: Cambridge University Press, 2002)).
For other variations of the basic distinction, *see*: Jonathan St. B. T. Evans, "How Many Dual-Process Theories Do We Need? One, Two, or Many?"; in: Jonathan Evans and Keith Frankish, eds., *In Two Minds: Dual Processes and Beyond* (Oxford: Oxford University Press, 2009); Keith E. Stanovich, "Distinguishing the Reflective, Algorithmic, and Autonomous Minds: Is it Time for a Tri-Process Theory?"; in: Jonathan Evans and Keith Frankish, eds., *In Two Minds: Dual Processes and Beyond* (Oxford: Oxford University Press, 2009); Peter Carruthers, "An Architecture for Dual Reasoning"; in: Jonathan Evans and Keith Frankish, eds., *In Two Minds: Dual Processes and Beyond* (Oxford: Oxford University Press, 2009); Serena Chen and Shelly Chaiken, "The Heuristic-Systemic Model in Its Broader Context"; in: Shelly Chaiken and Yaacov Trope, eds., *Dual-Process Theories in Social Psychology* (New York: Guilford Press, 1999).

[7] Kathleen D. Vohs and Mary Frances Luce, "Judgment and Decision Making": 744; in: Roy F. Baumeister and Eli J. Finkel, eds., *Advanced Social Psychology: The State of Science* (Oxford: Oxford University Press, 2010).

System 1	System 2
Defining Features	
Automatic	Time-intensive
Effortless	Effortful
Parallel	Serial
Reasons by association	Reasons by application of logic and rules
Intuitive	Analytical
Experiential	Rational
Holistic	Piecemeal
Contributions to Decision Errors	
Perceptual errors: The psychological impact of losses is greater than that of gains	Cognitive errors: Devoting much effort to deciding can hamper prediction of one's preferences
People confuse how easy it is for information to come to mind for trying to find base rates	At times it is better to devote less effort even if it means sacrificing decision accuracy
People confuse the representativeness of an instance for logic	
Feelings	
Preferences need no inferences: Feelings of good and bad arise very quickly	Full blown emotions contain cognition and emotion and are distinguishable from one another
Affect can automatically carry over to related decisions such as when fearful individuals make pessimistic judgments	Negative emotions such as regret are explicitly anticipated and avoided

System 1 and System 2 are often juxtaposed as being contradictory. Yet, as Kahneman points out, most of the time these systems work together rather well. [8] System 1 is very efficient – it requires little effort to perform at its peak. In general, System 1 is very good at its core functions; its initial reactions are usually very swift. Yet, System 1 is prone to cognitive biases – systematic decision-making errors. For example, it tends to answer easier questions than the ones it is really asked; it has almost no understanding of logic, statistics, and other probabilistic reasoning skills. Moreover, System 1 cannot be turned off; however, it can be overridden by System 2, but as the next section shows, System 2 is rarely eager to do that.

According to formalistic ideals, judicial decision-making is a pure product of the rule-based, controlled, and slow thinking processes – System 2. Yet, as the following sections show, such an ideal is a mirage.

1.2. EFFORTFUL THINKING AND MONITORING OF INTUITIVE ERRORS

Ideally, System 2 would always correct and override System 1's mistakes: "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

[8] Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011), p. 24.

intuitive if they retain the hypothesized initial proposal without much modification."[9] Yet, often System 2 may be either unaware of mistakes or may fail to correct mistakes for other reasons. System 1 cannot be turned off, so System 2 would have to be constantly vigilant to correct System 1's errors. But such continuous vigilance is unrealistic and impractical because System 2 is very slow and inefficient, thus most decisions will be made by System 1.[10]

One way that researchers test the ability to resist the first response that comes to mind is through the CRT (Cognitive Reflection Test), developed by Shane Frederick.[11] The test consists of three questions:

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

All three questions immediately suggest an intuitive but incorrect answer. Regarding the first question, the intuitive answer is ten cents, but since the bat costs one dollar more, that means that both would cost $1.20, so the correct answer is five cents. Regarding the second question, the correct answer is five minutes; third question: forty-seven days. Although one can answer all of these questions correctly with some reflection, most people answer correctly on average 1.24 of the 3 questions.[12] As Kahneman observes, "many people are overconfident, prone to place too much faith in their intuitions. They apparently find cognitive effort at least mildly unpleasant and avoid it as much as possible."[13]

Although the CRT seems simple on its face, it is a very precise indicator of susceptibility to cognitive errors. A recent study found that the CRT predicts performance on a wide sample of tasks from the heuristics-and-biases better than measures of cognitive ability, thinking dispositions, and executive functioning.[14]

[9] Daniel Kahneman and Shane Frederick, *supra* note 6: 51.
[10] Daniel Kahneman, *supra* note 8, p. 28.
[11] Shane Frederick, "Cognitive Reflection and Decision Making," *Journal of Economic Perspectives* 19 (2005).
[12] *Ibid*.: 29.
[13] Daniel Kahneman, *supra* note 8, p. 45.
[14] Maggie E. Toplak, Richard F. West and Keith E. Stanovich, "The Cognitive Reflection Test as a Predictor of Performance on Heuristics-and-Biases Tasks," *Memory & Cognition* 39 (2011).

One empirical study administered the CRT to Florida's trial judges. An average CRT score that judges obtained was 1.23 out of a possible 3.00; nearly one-third of the judges failed to answer a single question correctly and less than 15% answered all three questions correctly.[15]

Overall CRT Results: Judges Compared to College Students[16]

Sample (n)	Mean	Percent with 0 correct	Percent with 1 correct	Percent with 2 correct	Percent with 3 correct
MIT (61)	2.18	7	16	30	48
Carnegie Mellon (746)	1.51	25	25	25	25
Harvard (51)	1.43	20	37	24	20
Florida judges (192)	**1.23**	**31**	**31**	**24**	**15**
Michigan/Ann Arbor (1267)	1.18	31	33	23	14
Bowling Green (52)	0.87	50	25	13	12
Michigan State (118)	0.79	49	29	16	6
Toledo (138)	0.57	64	21	10	5

Overall, if the CRT is the best predictor of ability to resist the first (and erroneous) response, and judges fare no better than average experimental subjects, it is reasonable to conclude that judges are prone to cognitive errors in the same way that ordinary experimental subjects are.

1.3. DECISION FATIGUE

Meanwhile, declining from the noon of day,
The sun obliquely shoots his burning ray;
The hungry judges soon the sentence sign,
And wretches hang that jury-men may dine;

Alexander Pope – The Rape of the Lock: Canto 3

Not only System 2 is lazy in its oversight of intuitive judgments proposed by System 1, it is also easily fatigued. A classic caricature of legal realism has been the trope that justice is "what the judge ate for breakfast." One recent study tested whether there is some scientific basis for this trope. The results are such that if formalists had predicted them, they would have never used such a caricature.

The study data consisted of 1,112 judicial rulings of the Israeli parole board collected over a ten month period.[17] The study found that "the likelihood of a ruling in favor of a prisoner spikes at the beginning of each session—the probability of a favorable ruling steadily declines from ≈0.65 to nearly zero and jumps back up to

[15] Chris Guthrie, Jeffrey J. Rachlinski, and Andrew J. Wistrich, *supra* note 5: 14-15.
[16] *Ibid*.: 16; Shane Frederick, *supra* note 11: 27-28.
[17] Shai Danzigera, Jonathan Levav, and Liora Avnaim-Pessoa, "Extraneous Factors in Judicial Decisions," *Proceedings of National Academy of Sciences (USA)* 108 (2011).

≈0.65 after a break for a meal."[18] In other words, a prisoner is 650% more likely to get a favorable parole decision if his case is heard right after the break than the last in the series before an upcoming break. (The study of course carefully tested for other possible explanations).

The findings of the study, although disquieting, build on numerous previous studies showing that repeated judgments or decisions deplete individuals' executive function and mental resources.[19] The mental depletion increases the tendency to simplify decisions and accept the status quo.[20] Thus, for parole judges the status quo is not to grant a parole. Food breaks, however, restore glucose supply to the brain and enable individuals to make effortful decisions. The authors of the study thus summarized their main findings:

> We have presented evidence suggesting that when judges make repeated rulings, they show an increased tendency to rule in favor of the status quo. This tendency can be overcome by taking a break to eat a meal, consistent with previous research demonstrating the effects of a short rest, positive mood, and glucose on mental resource replenishment. … [O]ur results do indicate that extraneous variables can influence judicial decisions, which bolsters the growing body of evidence that points to the susceptibility of experienced judges to psychological biases. Finally, our findings support the view that the law is indeterminate by showing that legally irrelevant situational determinants—in this case, merely taking a food break—may lead a judge to rule differently in cases with similar legal characteristics.[21]

1.4. INTUITIVE AND EXPERIENTIAL DECISION-MAKING

As the previous sections have shown, while rule-based, analytical, rational, step-by-step decision making is possible in theory, in practice it is limited when it comes to both ordinary subjects and professional judges. It also means that judges make their usual decisions predominantly using System 1, which is intuitive and experiential, not rule-based or logical. Intuitive thinking, however, does not mean that a judge is flying blind at the decision. An intuitive mind is often superior – the unconscious mind has greater capacity than the conscious mind and so has access

[18] *Ibid*.: 6990.
[19] Kathleen D. Vohs, Roy F. Baumeister, Brandon J. Schmeichel, Jean M. Twenge, Noelle M. Nelson, Dianne M. Tice, "Making Choices Impairs Subsequent Self-control: A Limited Resource Account of Decision Making, Self-regulation, and Active Initiative," *Journal of Personality and Social Psychology* 94 (2008).
[20] *Ibid*. This phenomenon is also called ego-depletion.
[21] Shai Danzigera, Jonathan Levav, and Liora Avnaim-Pessoa, *supra* note 17: 6992.

to vast knowledge; conscious, step-by-step reasoning may be inferior even when the time is not pressing.[22]

The quality of intuitive thinking, however, depends on many factors, including education, upbringing, the beliefs of peers, personality, and so on.[23] Yet, as Kahneman points out, whether intuitive thinking will produce consistently sound judgments depends mostly on environment, available feedback, and prolonged practice:

> The acquisition of skills requires a regular environment, an adequate opportunity to practice, and rapid and unequivocal feedback about the correctness of thoughts and actions. When these conditions are fulfilled, skill eventually develops, and the intuitive judgments and choices that quickly come to mind will mostly be accurate. All this is the work of System 1, which means it occurs automatically and fast.[24]

Reliance on System 1 means that judges, like all people, are susceptible to cognitive biases. System 1 relies on heuristics – rules of thumb for decision-making. Heuristics make perfect sense in evolutionary perspective, even though they also predispose us to sub-optimal decisions in contemporary environment. Thus, heuristics also lead to cognitive biases. An example of heuristic and resultant cognitive bias is loss aversion: losses loom much larger than gains; in other words, emotional intensity of losing $100 will be compensated only by a gain of $200. For a rational economic agent, *homo economicus,* such decision-making rules seem obviously irrational.

Another example is the anchor-and-adjust heuristic; anchoring effect is the unconscious reliance on the first available information to make a decision even if the first available information is random.[25] For example, one study tested the anchoring effect on experienced German judges, who had on average more than 15

[22] Timothy D. Wilson and Jonathan W. Schooler, "Thinking Too Much: Introspection Can Reduce the Quality of Preferences and Decisions," *Journal of Personality and Social Psychology* 60 (1991).
As Posner also observes, Hutcheson's equating intuition to "hunch" was a mistake – "a hunch sounds like a guess, a shot in the dark" (Richard A. Posner, *supra* note 1, p. 113).
[23] *Ibid*., p. 98
[24] Daniel Kahneman, *supra* note 8, p. 416
[25] In the classical experiment by Amos Tversky and Daniel Kahneman participants had to guess the percentage of African nations that were members of the United Nations. Some people were asked whether it was more or less than 10%; others were asked whether it was more or less than 65%. The question that participants heard served as the anchor – an initial and unconscious suggestion from which participants would adjust their answer. Thus, the participants who were asked whether it was more or less than 10% answered on average 25%; the participants who were asked whether it was more or less than 65% answered on average 45% (Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases," *Science* 185 (1974)).
In a relatively more recent experiment, the researchers asked participants to guess how old Gandhi was when he died. Some people were asked whether Gandhi died before or after age of 140; although the question was obviously off the mark with his possibly real age when he died, this group was still influenced by the question – they answered on average that Gandhi died when he was 67 years old. Others were asked whether he died before or after age of 9; the estimates of this group were on average lower 17 years, i.e. that Gandhi died when he was 50 years (Fritz Strak and Thomas Mussweiler, "Explaining the Enigmatic Anchoring Effect: Mechanisms of Selective Accessibility," *Journal of Personality and Social Psychology* 73 (1997)).

years of judicial experience. The judges read a description of a woman on trial for shoplifting. The judges were asked to roll a pair of dice before indicating the exact prison sentence they would impose on the woman. The dice, however, were loaded to result in either 3 or 9. Obviously, the rolling of the dice is unrelated to sentencing, so judges should have not been influenced by it. And yet, the judges who rolled 3 sentenced the woman on average to 5 months and the judges who rolled 9 sentenced her on average to 8 months.[26]

There are dozens of other ways that System 1 can go astray. And it would be beyond the scope of the present work to mention all the cognitive biases that judges may be susceptible to. Suffice it to mention that empirical studies have found little or no difference between judges and ordinary subjects in heuristic decision-making and attendant cognitive biases.[27] Thus, judges, like other people, are prone not only to anchoring bias,[28] but also representativeness heuristic (neglecting statistic base rate),[29] hindsight bias (overestimating predictability of past events) and many others.

System 1 is not only susceptible to cognitive biases, but it also has little understanding of formal logic. For example, most college students consider this syllogism valid:[30]

> All roses are flowers.
> Some flowers fade quickly.
> Therefore some roses fade quickly.

But this syllogism is flawed - it commits the fallacy of unequal distribution. Likewise, System 1 is prone to make snap judgments and jump to conclusions even when only incomplete information is available.[31]

System 1 also tends to substitute easier questions for more difficult ones: whenever it faces the target question that is difficult, it will be prone to answer a heuristic question – the simpler question related to the target question.[32] This phenomenon is called attribute substitution. Attribute substitution is in turn part of a more general concept of effort-reduction, which states that people will use variety

[26] Birte Englich, Thomas Mussweiler, and Fritz Strack, "Playing Dice with Criminal Sentences: The Influence of Irrelevant Anchors on Experts' Judicial Decision Making," *Personality and Social Psychology Bulletin* 32 (2006).
[27] Chris Guthrie, Jeffrey J. Rachlinski, and Andrew J. Wistrich, "Inside the Judicial Mind," *Cornell Law Review* 86 (2001).
[28] *Ibid*.: 790
[29] *Ibid*.: 801.
[30] Daniel Kahneman, *supra* note 8, p. 24.
[31] *Ibid*., p. 79-89.
[32] For example, the target question – "How popular will the president be six months from now?" – is difficult to answer because it requires computation of myriad of factors, including many factors which are compounded by uncertainty; therefore, System 1 will likely substitute the target question with the heuristic question – "How popular is the president right now?" (*ibid*., p. 116).

of methods to reduce decision-making effort.[33] An experimental example of attribute substitution comes from studies on contingent valuation. In one study, three groups of subjects were asked how much they would pay to save 2,000 birds, or 20,000 birds, or 200,000 birds. One would expect that rational decision maker would be willing to pay much more to save 100 times more birds. Yet, the subjects were willing to pay approximately the same amount irrespective of the number of birds saved: $80 for 2,000 birds; $78 for 20,000 birds; $88 for 200,000 birds.[34] Attribute substitution explains that the subjects were not answering the questions they were asked, which would involve complex computations like the price of one bird multiplied by the total number, adjusted to its total population, scarcity, etc. Instead, they substituted it for an easier question: how much they were willing to pay for a prototypical bird. That is why their evaluations were almost the same.

Contrary to formalistic ideals, reliance on experiential and intuitive decision-making also means that cognition is inseparable from emotion.[35] This is not necessarily bad. Not all emotional reactions are illegitimate or bad for judicial decision-making. Emotion can be a form of thought, compressed and inarticulate.[36] Sometimes, however, emotional states, especially a misattribution effect, can impair the quality of decision-making.[37] Yet, even when decision-making is characterized by System 2 processes, emotions are unavoidable.[38] Here once again the formalistic idea of judging as a cold, purely rational thinking process, completely devoid of emotions, is a fantasy. And as Judge Posner further observes, judicial intuitionism is unlikely to disappear because of the institutional structure of adjudication – judges do not have time to use elaborate analytical procedures, before voting or afterwards, because of time pressures.[39]

[33] Anuj K. Shah & Daniel M. Oppenheimer, "Heuristics Made Easy: An Effort-Reduction Framework," *Psychological Bulletin* 134 (2008).
[34] William H. Desvousges, F. Reed Johnson, Richard W. Dunford, Kevin J. Boyle, Sara P. Hudson, and K. Nicole Wilson, "Measuring Natural Resource Damages with Contingent Valuation: Tests of Validity and Reliability"; in: Jerry A. Hausman, ed., *Contingent Valuation: A Critical Assessment* (Amsterdam: North Holland, 1993).
[35] We use the term *emotion* here for both affect and emotion proper, although researchers usually distinguish between the two terms. Affect refers to low-level, non-conscious, positive versus negative twinges; emotion stands for full-blown feeling states (Kathleen D. Vohs and Mary Frances Luce, *supra* note 7: 749).
[36] Richard A. Posner, *supra* note 1, p. 106.
[37] Kathleen D. Vohs and Mary Frances Luce, *supra* note 7: 749; *see also* Richard A. Posner, *supra* note 1, p. 106 (It depends on the emotion felt. Some emotions – anger, disgust, happiness – engage heuristic processing and increase person's certitude, as a results he or she is less likely to engage in systematic analysis. Other – uncertainty, hope, surprise, fear, worry – are opposite); Larissa Z. Tiedens and Susan Linton, "Judgment under Emotional Certainty and Uncertainty: The Effects of Specific Emotions on Information Processing," *Journal of Personality and Social Psychology* 81 (2001).
[38] Kathleen D. Vohs and Mary Frances Luce, *supra* note 7: 750.
[39] Richard A. Posner, *supra* note 1, p. 110.

1.5. SUMMARY: INTUITIVE V. RATIONAL JUDICIAL DECISION-MAKING

As the preceding sections have shown, there are two distinct thinking systems underlying human decision-making. System 2, the slow, rule-bound, effortful system would ideally monitor judgments proposed by System 1 and correct all flawed judgments that System 1 makes. Yet, in judges, like in all human subjects, System 2 is often languid and prefers to avoid even a mild cognitive strain. System 2 is also not fool-proof: soundness of its judgments depends among other factors on legal training and reasoning skills. Also, because of decision fatigue and ego depletion, decision-making is a limited resource.

All of this means that judges, like other people, will make most of their decisions by relying on the intuitive and experiential System 1. This thinking process works very well most of the time. But it does predispose judges to systemic errors – cognitive biases. It also means that judges, contrary to formalistic ideals, do not reason downward from legal rules to outcomes; instead, they tend to make snap judgments even if incomplete information is available. And more experienced judges are usually more likely to make intuitive decisions.[40]

2. EXPERT JUDGMENT AND JUDICIAL DECISION-MAKING

The interdisciplinary empirical research on decision-making has been blooming for at least a few decades now; however, most empirical studies on judgment and decision-making have been carried out with subjects other than judges. Thus, one can reasonably question whether general research on decision-making is applicable to judicial decision-making: while there is no doubt that judges are susceptible to many cognitive biases, there is still the possibility that their decision-making faculty is superior in some ways.[41]

One possible reason is that judges undergo a specialized training – legal education. Schauer, for example, suggests that legal training, subsequent legal

[40] *Ibid*., p. 109 ("The more experienced the judge, the more confidence he is apt to repose in his intuitive reactions and the less likely he is to be attracted to a systematic decision-making methodology, perhaps involving Bayes's theorem or other algorithms, decision trees, artificial intelligence, debiasing techniques, and so forth").

[41] Frederick Schauer, "Is There a Psychology of Judging?": 113; in: David E. Klein and Gregory Mitchell (eds.), *The Psychology of Judicial Decision Making* (American Psychology-Law Society) (New York: Oxford University Press, 2010) ("And that is why the existing research showing that judges are susceptible to many well-discussed cognitive failings and biases – anchoring and availability, for example – is highly important. Even though important, however, this research is incomplete. Even if judges when acting as finders of fact or when reaching verdicts are prone to all or most of these familiar reasoning failures, the question remains entirely open whether there are also areas in which judges think quite differently, even supposing that with respect to those areas judges would be similarly afflicted with the same or analogous cognitive deficiencies. The existing research tells us little about whether there are such areas of differential thinking, and, if so, what they look like, but until we can answer this question we cannot know whether the conclusions of Legal Realism are correct, and whether the hidden Legal Realist premises of the existing psychological research on judging are sound").

experience, and finally the judging experience may produce significant differences between judges and ordinary people. Therefore, one possibility is that trained lawyers are expert decision-makers in their field and thus make better legal decisions.[42] Another hypothesis is that it is not legal training in general that makes judges better decision-makers, but the experience of judging itself. Hence, it is judges not as lawyers but judges as judges proper who have enhanced judgment and decision-making abilities.[43] Both hypotheses about expert decision-making seem plausible, however, as the following sections show, such hypotheses are largely unsubstantiated.

2.1. LAWYERS AS EXPERT DECISION-MAKERS

It would be only too natural to expect that specialized training, including legal education, enhances decision-making and problem-solving skills. The idea that specialized training is useful goes back to the ancient Greeks: Plato urged statesmen to study arithmetic because "even the dull, if they had an arithmetical training … always become much quicker than they would otherwise have been"; the medieval scholastics thought that study of logic, especially syllogisms, trains the mind.[44]

However, at the end of the nineteenth century and the beginning of the twentieth century, eminent psychologists like William James and Edward Thorndike attacked the idea that training in disciplines like mathematics, logic, or Latin can improve reasoning abilities about everyday life events; for these critics, mathematics or formal logic have little resemblance with everyday-life events.[45] Thorndike showed that there was little transfer of training across tasks; for example, from cancelling letters to cancelling parts of speech, from estimating areas of rectangles of one size and shape to estimating areas of rectangles of another size and shape.[46] Later researchers likewise found that there was little or no transfer of solutions of one problem to solutions of another formally identical problem.[47]

Yet, it seems that these researchers erroneously concluded from these findings that no formal discipline can improve reasoning and problem-solving skills. A number of studies have shown that there is a difference between probabilistic and

[42] *Ibid.*: 105.
[43] *Ibid*.
[44] *See* Darrin R. Lehman, Richard O. Lempert, and Richard E. Nisbett, "The Effects of Graduate Training on Reasoning: Formal Discipline and Thinking about Everyday-life Events," *American Psychologist* 43 (1988); *reprinted in:* Richard E. Nisbett, ed., *Rules for Reasoning* (New Jersey: Routledge, 1993), p. 316.
[45] *Ibid*.
[46] *Ibid*.
[47] *Ibid*.

deterministic models. Probabilistic sciences, like psychology or economics, deal with unpredictable phenomena and with causes that are usually neither necessary nor sufficient; in contrast, deterministic sciences, like chemistry or physics, deal with phenomena which are characterized by the sufficient and necessary causal phenomena. Probabilistic sciences expose people to messy and probabilistic phenomena encountered in everyday life.[48]

When it comes to law, however, the contemporary empirical research, although not extensive, shows that legal education does not improve reasoning and problem-solving skills, at least beyond negligible levels or outside conditional logic. This is mostly because law, as an academic discipline (but not as a real-world legal practice), resembles more deterministic science model – solving legal issues with logic, and preferably deduction, and almost no exposure to uncertainty and probabilistic issues.

One study examined the difference in reasoning skills between graduates of psychology, medicine, chemistry, and law.[49] As a control procedure, the study looked at verbal reasoning skills; the main focus was on statistical and methodological reasoning skills, where students had to apply their reasoning skills to both scientific and everyday-life problems. The study was designed both as cross-sectional and longitudinal.[50] Initially, there were no differences in test scores across the four disciplines. Two years of training in all disciplines had no substantial effect on verbal reasoning skills. After two years of training, however, psychology graduates showed a 70% increase in methodological and statistical reasoning; medical training produced a 25% improvement in test scores; legal training, like graduate training in chemistry, had no substantial effects.[51]

[48] Thomas Gilovich, *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life* (New York: The Free Press, 1991), p. 190.
[49] Darrin R. Lehman, Richard O. Lempert, and Richard E. Nisbett, *supra* note 44: 431-442; p. 328.
[50] Cross-sectional study compared first-year and third-year graduate students to one another. In longitudinal study first-year students were reassessed two years later to compare their later performance with the original.
[51] *Ibid*.

Change of scores for statistical and methodological reasoning:

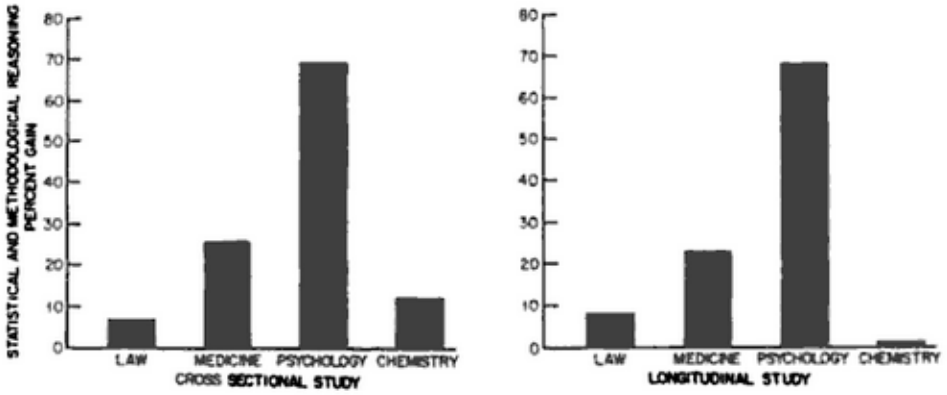

Figure from Darrin R. Lehman, Richard O. Lempert, and Richard E. Nisbett, "The Effects of Graduate Training on Reasoning: Formal Discipline and Thinking about Everyday-life Events," *American Psychologist* 43 (1988): 431-442; reprinted in: Richard E. Nisbett, ed., *Rules for Reasoning* (New Jersey: Routledge, 1993), p. 328.

The authors of the study thus summarized their findings regarding probabilistic reasoning:

> It appears that the probabilistic sciences of psychology and medicine teach their students to apply statistical and methodological rules to both scientific and everyday-life problems, whereas the nonprobabilistic science of chemistry and the nonscientific discipline of the law do not affect their students in these respects …. The luxury of not being confronted with messy problems that contain substantial uncertainty and a tangled web of causes means that [law and chemistry do] not teach some rules that are relevant to everyday life.[52]

A more recent empirical study likewise found limited effect of legal training on problem-solving skills. As the author of that study observed, for example, "in contrast to final-year medical students, third-year law students apparently had not yet refined the skill of distinguishing adequately between relevant and irrelevant facts."[53] Similarly, Carnegie Foundation's 2007 report on legal education concludes that "a number of studies have shown that students' moral reasoning does not appear to develop to any significant degree during law school."[54] Another study on decision-making of practicing attorneys likewise found that the decision-making skills of practicing lawyers are inferior.[55]

Overall, the studies suggest that legal training provides no such significant improvement in reasoning and problem-solving skills that some other disciplines

[52] *Ibid.*: 438; p. 335.
[53] Stefan Krieger, "The Development of Legal Reasoning Skills in Law Students: An Empirical Study," *Journal of Legal Education* 56 (2006): 352.
[54] William M. Sullivan, Anne Colby, Judith Welch Wegner, Lloyd Bond, Lee S. Shulman, *Educating Lawyers: Preparation for the Profession of Law* (Jossey-Bass/Carnegie Foundation for the Advancement of Teaching) (California: Jossey-Bass, 2007), p. 133.
[55] Randall Kiser, *Beyond Right and Wrong: The Power of Effective Decision Making for Attorneys and Clients* (Heidelberg: Springer, 2010), p. 29-141.

may provide. Conditional logic is the only significant reasoning skill which improves with legal education.[56] Yet, it would be a gross overstatement to suggest that conditional logic is the most important skill in legal judgment and decision-making. Therefore, legal training fails to develop the most important problem-solving and decision-making skills, including judgment under uncertainty, problem-solving of irregular factual patterns that lack clear causal connections, and other features that are crucial in real-life judicial decision-making.[57]

One reason is that the case method, which is the staple of legal education, is insufficient to develop sound decision-making skills. The main problem is that it foregoes evaluative reasoning skills: "reading, discussing and questioning students about cases in which the judges have already simplified, synthesized and occasionally omitted facts to support their conclusions – may not promote evaluative reasoning skills in real-life conflicts rich with factual ambiguities."[58] There are other major drawbacks of the case method. [59] For example, the facts presented in a judicial opinion may be biased to support the stated result. Also, the case method typically relies on appellate decisions; however, these decisions are usually the result of poor decision-making in lower courts, and so studying only appellate decision(s) may exclude models of sound decision making, i.e. cases that were not appealed.

Needless to mention, most law students who fail even primitive legal reasoning and problem-solving skills in law schools, are not appointed to the bench. Yet, it would be equally naïve to expect that a lawyer becomes a judge only after he or she had developed superior decision-making and problem-solving skills.

[56] Conditional logic is concerned with proof that follows from the assertion a conditional – essentially a proof that the antecedent necessarily leads to the consequent. Schematically, it is usually represented as follows: 1. A > B ("If A, then B") 2. B > C ("If B, then C"). 3. A (proof assumption - A is true) 4. B (modus ponens; - "If A then B; A, therefore B"). 5. C (modus ponens; "If B then C; B, therefore C").
In the study by Lehman and others, law students, like graduate students of psychology and chemistry, improved on all four types of conditional logic questions: arbitrary, causal wording, permission wording, and biconditional (Darrin R. Lehman, Richard O. Lempert, and Richard E. Nisbett, *supra* note 44: 431-442; p. 329).

[57] Gilovich thus explains why training in psychology and similar social sciences yields superior reasoning ability: "Some of the material conflicts with students' pre-existing beliefs and thus provides much more than the usual incentive to engage in critical analysis, to suggest alternative explanations, and to consider the adequacy of both existing data and other potentially informative evidence. The student is thus encouraged to engage his or her analytic faculties with unusual intensity because the very nature of the material invites it. The complexity of the phenomena, the difficulty of untangling correlated variables, and the relative scarcity of truly decisive experiments compel all but the most disengaged students to dig deeper and think harder" (Thomas Gilovich, *supra* note 48, p. 192-193).

[58] Randall Kiser, *supra* note 55, p. 150.

[59] *Ibid*.

2.2. JUDICIAL EXPERIENCE AND EXPERT JUDGMENT

Another hypothesis is that judges develop special decision-making and problem-solving skills because of the judging experience itself. This hypothesis usually falls under the rubric of expert judgment. Admittedly, there are no empirical studies that would directly falsify the hypothesis of judicial experience as a basis for expert judgment. Yet, numerous other studies on expertise, albeit indirectly, contradict this possibility.

In general, contrary to the popular myth, studies show that expert performance does not improve with years of experience.[60] For example, experienced surgeons are no better than medical residents at predicting hospital stays after surgery;[61] clinical psychologists with years of clinical experience are no better than novices at judging personality disorders;[62] auditors with years of experience are no better than novices at detecting corporate fraud.[63] The same pattern exists across the board.[64]

The so-called regular, high-validity environments are the exception. Such fields are regular enough to be predictable, and most importantly, experts in these fields learn these regularities through prolonged practice.[65] Predictability depends essentially on the quality and speed of feedback. Yet, there are relatively very few fields that could be characterized as high-validity environments.[66]

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[60] *See* Geoffrey Colvin, *Talent is Overrated: What Really Separates World-Class Performers from Everybody Else* (New York: Penguin Books, 2008), p. 3-6.
[61] Colin F. Camerer and Eric J. Johnson, "The Process-Performance Paradox in Expert Judgment: How Can Experts Know So Much and Predict So Badly?"; in: K. Anders Ericsson and Jacqui Smith, eds., *Toward a General Theory of Expertise: Prospects and Limits* (New York: Cambridge University Press, 1991).
[62] *Ibid*.
[63] Jean Bedard, Michelene T. H. Chi, Lynford E. Graham, and James Shanteau, "Expertise in Auditing," *Auditing* 12 (1993).
[64] Geoffrey Colvin, *supra* note 60, p. 3-4 ("In field after field, when it came to centrally important skills—stockbrokers recommending stocks, parole officers predicting recidivism, college admissions officials judging applicants—people with lots of experience were no better at their jobs than those with very little experience. (...) Bizarre as this seems, in at least a few fields it gets one degree odder. Occasionally people actually get worse with experience. More experienced doctors reliably score lower on tests of medical knowledge than do less experienced doctors; general physicians also become less skilled over time at diagnosing heart sounds and X-rays. Auditors become less skilled at certain types of evaluations"). *See also* Philip E. Tetlock, *Expert Political Judgment: How Good Is It? How Can We Know?* (Princeton, NJ: Princeton University Press, 2005).
[65] *See generally* K. Anders Ericsson, N. Charness, P. Feltovich, and R. R. Hoffman, eds., *The Cambridge Handbook of Expertise and Expert Performance* (Cambridge: Cambridge University Press, 2006); K. Anders Ericsson, "The Acquisition of Expert Performance: An Introduction to Some of the Issues"; in: K. Anders Ericsson, ed., *The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games* (New Jersey: Lawrence Erlbaum, 1996); K. Anders Ericsson, "The Influence of Experience and Deliberate Practice on the Development of Superior Expert Performance"; in: K. Anders Ericsson, N. Charness, P. Feltovich, and R. R. Hoffman, eds., *The Cambridge Handbook of Expertise and Expert Performance* (Cambridge: Cambridge University Press, 2006).
[66] For example, anesthesiology is a high-validity environment because anesthesiologists receive quick feedback of their actions and thus can learn fast; radiology, on the other hand, is a low-validity environment because radiologists usually do not receive feedback for months, if ever, about accuracy of their diagnosis. Psychotherapy, as Kahneman observes, is a deceptively low-validity environment: "Psychotherapists have many opportunities to observe the immediate reactions of patients to what they say. The feedback enables them to develop the intuitive skill to find the words and the tone that will calm anger, forge confidence, or focus the patient's attention. On the other hand, therapists do not have

Judging, if anything, is a very low-validity environment. For one, if judges receive any feedback at all about the quality of their decisions, it is usually months after the decision is made—when the appellate court reviews the case. Most likely, however, judges do not receive any feedback at all, not to mention instant feedback required for improved expert performance. In this context, even the case method has some advantages over actual experience of judging: the case method usually provides a law student with immediate feedback about decision-making and legal reasoning quality.

Another reason that compounds the problem is that most judges are generalists, and thus any feedback, if it ever reaches them at all, is dispersed:

> With the exception of the tasks judges perform repeatedly, it might take a long time for judges to accumulate enough feedback to avoid errors. It is as if a professional tennis player divided his time or her time among tennis, volleyball, softball, soccer, and golf rather than concentrating on tennis – the player's opportunity to develop "tennis intuition" would diminish. … Moreover, because the benefit of experiential learning in a wicked [low-validity] environment is limited, training may be necessary to compensate for deficiencies in the learning environment.[67]

In general, the institutional system of courts[68] and the nature of judging means that judicial experience itself does not improve judicial decision-making significantly, and general empirical research on decision-making will usually apply with equal force to judicial decision-making.

CONCLUSIONS

Overall, the main lesson we can draw from the empirical research is not to overrate distinctiveness of judicial decision-making. The myth surrounding judicial dispute settlement is that judges, although otherwise ordinary people, rise above ordinary human reasoning capabilities once they sit on the bench, and thus are able to demonstrate almost supreme reasoning ability: to make cold, rational, purely logical decisions, which are devoid of intuitions, experiential thinking, and any emotions.

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a chance to identify which general treatment approach is most suitable for different patients. The feedback they receive from their patients' long-term outcomes is sparse, delayed, or (usually) nonexistent, and in any case too ambiguous to support learning from experience" (Daniel Kahneman, *supra* note 8, p. 242).

[67] Chris Guthrie, Jeffrey J. Rachlinski, and Andrew J. Wistrich, *supra* note5: 39-40.

[68] Chris Guthrie, Jeffrey Rachlinski, and Andrew Wistrich suggest one way to improve this aspect: "[J]urisdictions could adopt peer-review processes to provide judges with feedback. For example, every two years, three experienced judges from other jurisdictions could visit a target court. They could select a few cases recently decided by each target court judge, read all of the rulings and transcripts, and then provide the judges with feedback on their performance and constructive suggestions for improvement" (*ibid*.: 39).

Yet, as the empirical research demonstrates, judges are no different from ordinary research subjects in their preference for automatic thinking over logical rule-based thinking, even when intuitive thinking might lead to systematic decision errors. While a rule-based thinking system is capable of overriding judgments of the automatic system, in practice it seldom does so; moreover, this rule-based system is easily depleted, and once depleted it defers to the intuitive system. Thus, judicial decision-making, like decision-making in general, is sensitive to numerous seemingly unimportant factors, even such trivial features as breakfast and lunch times.

This means that judges, like other people, will tend to make snap judgments even when incomplete information is available; these snap judgments will sometimes be based on logical thinking and sometimes not. They will also tend to substitute easier questions for more difficult ones. And all of this is only a small number of ways in which automatic, intuitive thinking system differs from the formalistic ideals of judicial decision-making. Yet again, it is important to note that System 1, by and large, will produce reasonable decisions most of the time.

In general, indirect empirical evidence also suggests that legal training or judicial experience does not develop superior expert judgment. One reason why judges perform no better than ordinary subjects is because judging is a low-validity environment – it provides no instant feedback about the quality of decisions made and thus judges do not improve their decision-making skills.

All of these findings, understandably, are very unpleasant to believers of rational judicial decision-making models. And the judicial establishment is not very likely to embrace the emerging discoveries from the empirical sciences because it threatens the institutional ethos. One reason, as Judge Posner points out, is "judges want to deny the role of subjectivity in judicial decision making" and they also want "to convince people they wear blinders to keep them from straying off the beaten path; that they are society's dray horses."[69]

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[69] Richard A. Posner, *supra* note 1, p. 72.

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