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Heuristics and Biases in Judicial Decisions

Eyal Peer & Eyal Gamliel

A famous tale talks about three baseball umpires who were asked how they rule on a ball. One said, “I call it like I see it.” Another said, “I call it like it is.” And the last one (and this is attributed to umpire Bill Klem) said, “It ain’t nothin’ till I call it.” While the first umpire admitted he was an imperfect human observer, the second and third umpires claimed they were infallible and judged cases only based on their objective merits. So, what can be said about court judges? Are court judges such impartial rulers that they can “call it like it is”? Or, as the first umpire humbly confessed, are they limited human observers confined by the boundaries of human cognition?

In this article, we briefly review some of the accumulating evidence suggesting that in some cases judges could be prone to cognitive fallacies and biases that might affect their judicial decisions. We review several studies on cognitive biases relating to elements of the hearing process (considering evidence and information), ruling, or sentencing. These findings suggest that irrelevant factors that should not affect judgment might cause systemic and predictable biases in judges’ decision-making processes in a way that could be explained using known cognitive heuristics and biases.

Heuristics are cognitive shortcuts, or rules of thumb, by which people generate judgments and make decisions without having to consider all the relevant information, relying instead on a limited set of cues that aid their decision making.¹ Such heuristics arise due to the fact that we have limited cognitive and motivational resources and that we need to use them efficiently to reach everyday decisions. Although such heuristics are generally adaptive and contribute to our daily life, the reliance on a limited part of the relevant information sometimes results in systemic and predictable biases that lead to sub-optimal decisions. Amos Tversky and Daniel Kahneman (who later won an economics Nobel Prize for his joint work with the late Tversky) introduced the heuristics-and-biases approach by first identifying key heuristics and the biases they sometimes cause. For example, the availability heuristic is the one by which we judge the probability of an event based on how easy it is to recall instances of such an event. Try to think, for example, of words that start with the letter “r” compared to words that have “r” as the third letter. Although the latter is more frequent in English, people think there are more words that start with “r” simply because they are easier to recall.²

The use of the availability heuristic, as with other cognitive

and judgmental heuristics, is one of the System 1 processes of thinking.³ System 1 processes are those in which thinking, judgment, and choice are more intuitive, experiential, and adaptive. They are faster and consume fewer cognitive resources. This contrasts the System 2 processes, which are more analytic, relying on facts and normative rules and requiring many more cognitive resources—which are often not available in everyday situations.⁴ Although heuristics are highly adaptive and sometimes offer “good-enough” solutions to a problem, they also lead to judgmental biases, fallacies, and illusions that hamper people’s judgments, choices, and decision making.

Various heuristics and biases have been identified and described in research literature.⁵ In this article, we review evidence on the use of heuristics and biases among court judges (as well as other professional law experts) that affect judgment and the decision-making process in the courtroom. Before we begin, we would like to note two related topics that are not addressed in this article. The first concerns the vast literature about social biases, such as racial bias or gender bias, that are sometimes found in trials. Although this is a very important issue, much has already been said (and done) about it, and it is, as the reader will notice, very different from the cognitive biases we describe here. Second, much research has focused on biases among jurors’ decisions making. Although we sometimes mention jurors in the following pages, we decided to generally exclude such research from the current review because we would like to focus on how professional judges (and sometimes lawyers) might be prone to cognitive biases, despite their experience and expertise. In the next sections, we review evidence for cognitive and judgmental biases that pertain to the hearing process, the ruling process, and the sentencing process.

BIASES IN THE HEARING PROCESS

During a trial, judges are presented with evidence; they may ask for additional or other evidence, they may judge evidence as inadmissible, or they may decide to give more (or less) weight to certain pieces of evidence. Such tasks in the hearing process might be affected by several cognitive biases including the confirmation bias, the hindsight bias, or the conjunction fallacy.

Confirmation Bias

If people have a preconception or hypothesis about a given issue, they tend to favor information that corresponds with their prior beliefs and disregard evidence pointing to the con-

Footnotes

1. Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *Sci.* 1124 (1974).
2. DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* (2011) [hereinafter *THINKING*]; JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES

(Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982); Tversky & Kahneman, *supra* note 1.

3. See, e.g., *THINKING*, *supra* note 2.

4. *Id.*

5. See *id.* for a recent review of heuristics and biases.

trary. This confirmation bias makes people search, code, and interpret information in a manner consistent with their assumptions, leading them to biased judgments and decisions.⁶ For example, in a classic study at Stanford University, participants who were either for or against capital punishment read about studies that either supported or challenged capital punishment. It was shown that participants favored studies that followed their prior attitudes: those who were in favor of capital punishment agreed more with studies that confirmed their position and rated those studies as better and more convincing, while those who were against capital punishment favored the studies that argued against it.⁷

Confirmation bias can also affect judges when they hear and evaluate evidence brought before them in court. Specifically, judges might be biased in favor of evidence that confirms their prior hypotheses and might disregard evidence that does not correspond with their previous assumptions. Indeed, several studies have pointed to the occurrence of this bias among judges, lawyers, or police officers. For example, Rassin and his colleagues presented these groups of experts with a murder case in which the victim was a female psychiatrist and the prime suspect was the wife of one of her patients.⁸ The wife was accused of killing the psychiatrist, allegedly out of jealousy. Participants were asked to review 20 pieces of information and to rate the degree these incriminated or exonerated the prime suspect. However, half of the participants were also told about the possibility of another suspect: a former male patient of the psychiatrist who had been harassing her for a long time. Surprisingly, all participants rated the pieces of evidence similarly and all thought the prime suspect was guilty in the same degree. Thus, it seems that the judges, lawyers, and police officers failed to consider the alternative scenario. Evidence was considered only if it helped them confirm their prior belief of the prime suspect's guilt and was disregarded if it pointed to a different suspect.

Hindsight Bias

When people evaluate events or outcomes after they have occurred, they sometimes exhibit a hindsight bias when they judge the event as being more predictable than it was before it actually happened. This “we knew it all along” phenomenon has been shown to occur in many areas such as history, medicine, finance, and the law, among others.⁹ In the basic experiment, participants are given a set of possible outcomes and are told which one of them is true. Then they are asked to assess

the probability of each outcome. Although different participants are told that different outcomes are true, all assign higher probabilities to the outcome told to be true, no matter what it is.¹⁰ In general, the hindsight bias refers to the inequality between foresight and hindsight: although events are less predictable before than after they actually happened, people cannot ignore information about whether an event has happened or not, and they assign it a higher probability in the former case.

Hindsight bias has been shown to occur in the courtroom as well, mainly in liability cases.¹¹ In such cases, the task of the judges or jurors is to assess how foreseeable an outcome was and to evaluate whether the plaintiff's behavior took this risk into consideration. The problem is that judges evaluate the outcome in hindsight, while the plaintiff only had the chance to provide foresight about it. For example, in one case a physician was accused of malpractice because he failed to detect a tiny tumor in an early chest radiography. The tumor got bigger and the patient died as a result, leading to the malpractice claim. The physician was found guilty after another radiologist—who saw the radiographs after the tumor was found—testified that the tumor could have been detected in the early radiography.¹² Clearly, the second radiologist had the benefit of knowing the tumor was actually there, an advantage the first physician did not have at the time. In addition, studies have found that the severity of the outcome increases hindsight bias dramatically. For example, judges who were informed that a psychiatric patient became violent were more likely to find the patient's therapist negligent than those who did not receive information about the outcome and its severity.¹³

Conjunction Fallacy

Another type of judgmental bias relates to how people judge the probability of events based on the detail in which these events are described. In particular, it has been found that more detailed descriptions of an event can give rise to higher judged probabilities.¹⁴ This bias has been termed the conjunction fallacy because it shows that people erroneously believe that events described in more detail are more probable than those that are described in less detail. According to classic probability theory, less detailed events actually contain various

Confirmation bias can . . . affect judges when they hear and evaluate evidence. . . .

6. SCOTT PLOUS, *THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING* (1993).
 7. Charles G. Lord, Lee Ross, & Mark R. Lepper, *Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence*, 37 J. PERSONALITY & SOC. PSYCHOL. 2098 (1979).
 8. Eric Rassin, Anieta Eerland, & Ilse Kuijpers, *Let's Find the Evidence: An Analogue Study of Confirmation Bias in Criminal Investigations*, 7 J. INVESTIGATIVE PSYCHOL. & OFFENDER PROFILING 231 (2010).
 9. Baruch Fischhoff, *An Early History of Hindsight Research*, 25 SOC. COGNITION 10 (2007).
 10. Baruch Fischhoff & Ruth Beyth, *I Knew It Would Happen: Remem-*

bered Probabilities of Once-Future Things, 13 ORGANIZATIONAL BEHAVIOR & HUM. PERFORMANCE 1 (1975).
 11. See Erin M. Harley, *Hindsight Bias in Legal Decision Making*, 25 SOC. COGNITION 48 (2007), for a review of hindsight bias in the courtroom.
 12. Leonard Berlin, *Hindsight Bias*, 175 AM. J. ROENTGENOLOGY 597 (2000).
 13. Susan J. LaBine & Gary LaBine, *Determinations of Negligence and the Hindsight Bias*, 20 L. & HUM. BEHAVIOR 501 (1996).
 14. See, e.g., Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COGNITIVE PSYCHOL. 430 (1972).

As one study showed, experienced judges were not different from inexperienced jurors in reacting to inadmissible evidence.

instances of more detailed events and thus cannot be less probable than any of the contained events. For example, just as the probability of an object being a fruit cannot be smaller than the probability it is an apple, the probability of a suspect being convicted of a crime cannot be smaller than the probability that he will be convicted of a specific crime, such as burglary.

However, one study showed that expert attorneys actually committed this conjunction fallacy when asked to evaluate the chances of a specific case

(*Jones vs. Clinton*) being disposed by a judicial verdict as opposed to an outcome other than a judicial verdict.¹⁵ When attorneys were asked to evaluate the probabilities of different types of outcomes that were not judicial verdicts (such as settlements, dismissals, withdrawals, etc.), they assigned much higher probabilities to each of these outcomes—sometimes totaling even higher than 1—than they did to the general probability of the case being disposed by an outcome that was “not a judicial verdict.”¹⁶ Although no studies have examined this conjunction fallacy among judges, research on other biases among judges (such as the research reviewed in this article) leads us to predict that judges might be prone to this bias as well.

BIASES IN THE RULING PROCESS

The biases described in the previous section related to the hearing process, but they also involved effects on the outcome of a trial and the judge’s ruling process. In the next section we review more examples of different biases that affect judges’ ruling processes. These include the inability to ignore inadmissible evidence and biases in decisions of sequential ruling.

Inability to Ignore Inadmissible Evidence

Sometimes evidence that is presented in trial can be deemed as inadmissible because it was obtained illegally, is considered hearsay, is highly prejudicial, or is problematic for some other reason. When inadmissible evidence is wrongfully presented in jury trials, judges may instruct juries to disregard or ignore the

evidence. However, many studies have shown that a jury’s ability to not consider inadmissible evidence is questionable at best. For example, Doob and Kirshenbaum showed that mock jurors were more likely to rate a defendant as guilty when they were exposed to prior criminal-record information than when no record information was given, even when judicial instructions were that prior record information should be used only to determine credibility rather than as an indicator of guilt.¹⁷ Other studies showed similar findings, as jurors’ decisions seemed unaffected by instructions to disregard or ignore inadmissible evidence.¹⁸

That jurors—who are inexperienced laymen—cannot ignore inadmissible evidence is not as surprising as is the fact that some judges could not do so either. As one study showed, experienced judges were not different from inexperienced jurors in reacting to inadmissible evidence.¹⁹ In this study, both groups read about a product-liability case including (or not including) biasing material and were either instructed (or not) to disregard this piece of inadmissible evidence. Both jurors’ and judges’ verdicts depended heavily on whether the biasing material was included, but these decisions were not altered if that evidence was deemed as inadmissible. Thus, it seems that judges, as with jurors, cannot easily disregard inadmissible evidence, although they know they should.

Biased Decisions in Sequential Ruling

When judges make repeated sequential rulings, they tend to rule more in favor of the status quo over time, but they can overcome this tendency by taking a food break.²⁰ In their study, Danziger and his colleagues examined 1,112 judicial rulings by 8 Israeli judges, made over 50 days in a 10-month period, all regarding parole requests.²¹ The study showed that about 65% of the rulings were in favor of the plaintiff at the beginning of each session (in the morning, after breakfast break, and after lunch break), and they gradually decreased to 0-10% at the end of each session. The authors concluded that the repeated rulings depleted the judges’ mental resources, causing judges to have a higher likelihood of granting parole in the first cases after a break.²² However, additional analyses showed that some overlooked factors—such as the non-random ordering of cases (cases with representation sometimes go first), and the fact that the parole board tries to complete cases from one prison before taking a meal break—could have accounted for some of the observed downward trend.²³

15. Craig R. Fox & Richard Birke, *Forecasting Trial Outcomes: Lawyers Assign Higher Probability to Possibilities That Are Described in Greater Detail*, 26 L. & HUM. BEHAVIOR 159 (2002).

16. *Id.*

17. Anthony Doob & Hershi M. Kirshenbaum, *Some Empirical Evidence on the Effect of s. 12 of the Canada Evidence Act Upon an Accused*, 15 CRIM. L. Q. 88 (1972).

18. See Joel D. Lieberman & Jamie Arndt, *Understanding the Limits of Limiting Instructions: Social Psychological Explanations for the Failures of Instructions to Disregard Pretrial Publicity and Other Inadmissible Evidence*, 6 PSYCHOL., PUB. POLY, & L. 677 (2000), for a review of studies about jurors’ decisions in relation to evidence instructions.

19. Stephan Landsman & Richard F. Rakos, *A Preliminary Inquiry into the Effect of Potentially Biasing Information on Judges and Jurors in Civil Litigation*, 12 BEHAVIORAL SCI. & L. 113 (1994).

20. Shai Danziger et al., *Extraneous Factors in Judicial Decisions*, 108 PROC. NAT’L ACAD. SCI. 17, 6889-92 (2011).

21. *Id.*

22. This finding has been criticized by others. See, e.g., Keren Weinsshall-Margel & John Shapard, *Overlooked Factors in the Analysis of Parole Decisions* 108 PROC. NAT’L ACAD. SCI. (2011, Oct. 18) (Letters, online only), available at <http://www.pnas.org/content/108/42/E833.full.pdf+html>.

23. *Id.*

BIASES IN THE SENTENCING PROCESS

The next and final group of biases we review here relate to the process of sentencing, or assigning punishment to the convicted party. First, we review a comprehensive study that modeled sentencing decision making by comparing normative to heuristic models. Second, we discuss a prevalent bias in sentencing that stems from the anchoring-and-adjustment heuristic.

Modeling Sentencing Decisions

In the beginning of the article, we asked whether judges are rational decision makers who contemplate every relevant aspect in the optimal manner or whether they are sometimes satisfied with using simpler heuristics. One study that tried to answer this question regarding sentencing decisions examined several possible normative and heuristic cognitive models in trying to evaluate which model better described judicial decisions and the magnitude of sentences in trials on theft, forgery, and fraud in a German court.²⁴ The results showed that with respect to relatively minor offenses, prosecutors and judges considered only a limited number of factors while neglecting other legally relevant and highly important ones. The discrepancies between the number of factors that should have been considered and the number of those actually considered, according to the decision analysis, were higher when the offense characteristics were less serious; for more serious offenses, the discrepancies found were smaller. Examining both judges and prosecutors in the context of sentencing is important due to the high frequency of plea bargaining, at least in U.S. courts.²⁵ For example, although judges and prosecutors indicate that they base their sentencing and sentencing requests on the relevant and important factors of the presence of a confession or a prior record, the analysis revealed that these factors were neglected. Other relevant and legally important factors indeed affected the sentencing, while possible factors that should not affect sentencing (e.g., race, sex, nationality) were found not to have affected it. Von Helversen and Rieskamp indicated that the neglected factors could be explained by cognitive constraints but also by time limitations under which sentencing decisions were made.²⁶

Anchoring-and-Adjustment

Anchoring-and-adjustment refers to the process of assimilation of a numeric estimate toward a previously considered standard. In their classic anchoring study, Tversky and Kahneman asked participants comparative and absolute consecutive questions about the percentage of African nations in the

United Nations.²⁷ In the comparative question, participants indicated whether the percentage of African nations in the U.N. was higher or lower than an arbitrary number (the anchor): either 65 or 10 (the alleged result of spinning a roulette wheel). Then, participants were asked an absolute question regarding their best estimate of the actual percentage. Absolute judgments were assimilated to the provided anchor value, so the mean estimate of African nations in the U.N. among participants who received the high anchor was 45%, compared to 25% for participants receiving the low anchor.

Since Tversky and Kahneman's classic study, the effect of anchoring-and-adjustment has been demonstrated in various domains of judgment and decision making and was proven to be a strong, robust, reliable, and persistent psychological effect.²⁸ Several theoretical explanations have been offered for the mechanism through which the anchor affects the numerical estimation or prediction. Some scholars believe that people integrate the anchor to the answer and adjust from it insufficiently,²⁹ adjusting estimates until an acceptable value is found; however, the adjustment is usually insufficient because it arrives at the nearest upper or lower boundary of a large range of acceptable values.³⁰ There is also the selective-accessibility model, in which comparing a target to an anchor leads to a biased search strategy consistent with positive-hypothesis testing: when presented with a low anchor, people will retrieve information consistent with the hypothesis that the estimate is small, and vice versa.³¹

As can be expected, judges have also been found to be affected by anchors in their judicial decisions. As criminal-sentencing decisions pertain to numeric quantities, they are also affected by numeric anchors, whether they are minimal sentences that the law presents or sentences demanded or recommended by prosecutors,³² attorneys, or probation officers.³³ For example, anchoring affected both novice and experienced judges when they were presented with two different demands for sentence by an alleged prosecutor on a hypothetical rape case—12 months or 34 months.³⁴ Anchoring affected the ruling sentence even when the judges declared that the anchor was not relevant to their decision. Enough and Mussweiler suggested that the anchor affected the ruling of the judges because of selective increase in the accessibility of anchor-consistent knowledge: given an anchor of a relatively severe punishment

[J]udges have also been found to be affected by anchors in their judicial decisions.

24. Bettina von Helversen & Jörg Rieskamp, *Predicting Sentencing for Low-Level Crimes: Comparing Models of Human Judgment*, 15 J. EXPERIMENTAL PSYCHOL.: APPLIED 375 (2009).

25. *Id.*

26. *Id.*

27. Tversky and Kahneman, *supra* note 1.

28. See, e.g., Thomas Mussweiler, *The Malleability of Anchoring Effects*, 49 EXPERIMENTAL PSYCHOL. 67 (2002); Fritz Strack & Thomas Mussweiler, *Explaining the Enigmatic Anchoring Effect: Mechanisms of Selective Accessibility*, 73 PSYCHOL. 437 (1997); Timothy D. Wilson, Christopher E. Houston, Kathryn M. Eiting, & Nancy Brekke, *A New Look at Anchoring Effects: Basic Anchoring and Its Antecedents*, 125 J. EXPERIMENTAL PSYCHOL.: GENERAL 387 (1996).

29. Tversky & Kahneman, *supra* note 1.

30. Karen E. Jacowitz & Daniel Kahneman, *Measures of Anchoring in Estimation Tasks*, 21 PERSONALITY & SOC. PSYCHOL. BULL. 1161 (1995).

31. Strack & Mussweiler, *supra* note 28.

32. Birte Enough & Thomas Mussweiler, *Sentencing Under Uncertainty: Anchoring Effects in the Courtroom*, 31 J. APPLIED SOC. PSYCHOL. 1535 (2001).

33. Ebbe B. Ebbesen & Vladimir J. Konečni, *The Process of Sentencing Adult Felons: A Causal Analysis of Judicial Decisions*, in THE TRIAL PROCESS 413 (Bruce Sales Dennis ed., 1981).

34. Enough & Mussweiler, *supra* note 32.

(34 months in the above study), the judges retrieved more information that was consistent with this sentence—that is, evidence and details that were consistent with more severe punishment.³⁵ In contrast, given the more lenient punishment (12 months in the study), the judges retrieved more information that was consistent with this sentence—that is, evidence and details that were consistent with less severe punishment. As a result, the rulings of the judges were affected by the given anchor, whether it was more relevant and informative or less so.

In a follow-up study, Englich and others showed a similar anchoring effect even when the anchor was set not by the prosecutor (a potentially relevant source), but rather by a journalist (who is an irrelevant source, as the media should not affect judicial decisions).³⁶ The study compared the effect of anchoring on judges who were experts in criminal law versus others who were not, to find similar effects for the two groups.³⁷ These findings are consistent with those of Northcraft and Neale, as well as Mussweiler and others, who found that the judgments of experts are also susceptible to the effect of anchoring.³⁸

CONCLUSION

In this article, we summarized research that demonstrated how heuristic thinking is involved in judicial decision making. Although heuristic thinking is typically efficient, it may cause biases at times.³⁹ Heuristic thinking was demonstrated in various contexts of the hearing process, the ruling process, and the sentencing process. The hearing process may be affected by hindsight bias, confirmation bias, or the conjunction fallacy. Heuristic thinking also characterizes some of the ruling process that might be biased, since judges are unable to ignore inadmissible evidence and since they make biased decisions in sequential rulings. Heuristic thinking might also affect the sentencing process, due to a tendency to rely on a limited number of factors and because of the dominant effect of anchoring. Thus, research suggests that judges, prosecutors, and other professionals in the legal field use heuristic thinking in judicial processes and decisions, although not all of them may be aware of such use.

A question that arises is, “What can be done to counteract judicial bias?” To answer this question, one must first determine the origin of the bias. The method of overcoming bias depends on whether the cause of bias lies in the task, the judge, or a combination of the two. If we assume a judge is the culprit, we may employ techniques that aim at improving the judge’s ability to circumvent the bias. Fischhoff identified several such techniques, including warning people in advance

about the existence of bias, describing the likely direction of a bias, illustrating biases to the judges, and providing extended training, feedback, coaching, and other interventions.⁴⁰ He concluded that the first three strategies yielded limited success and that even intensive, personalized feedback and training produced only moderate improvements in decision making.⁴¹ Although some experiments have shown that some biases, such as the hindsight bias, could be counteracted, research is still needed to explore whether it is possible to counteract other biases among judges, such as the ones described in this article, and to what degree.⁴² Obviously, awareness to the heuristic thinking and the resulting possible biases affecting judicial decisions is a prerequisite for any future attempt to limit these biases. We hope that this article will be a small step towards that goal.



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35. *Id.*

36. Birte Englich et al., *Playing Dice with Criminal Sentences: The Influence of Irrelevant Anchors on Experts’ Judicial Decision Making*, 32 PERSONALITY & SOC. PSYCHOL. BULL. 188 (2006).

37. *Id.*

38. Gregory B. Northcraft & Margaret A. Neale, *Experts, Amateurs, and Real Estate: An Anchoring-and-Adjustment Perspective on Property Pricing Decisions*, 39 ORGANIZATIONAL BEHAVIOR & HUM. DECISION PROCESS 84 (1987); Thomas Mussweiler et al., *Overcoming the Inevitable Anchoring Effect: Considering the Opposite Compensates*

for Selective Accessibility, 26 PERSONALITY & SOC. PSYCHOL. BULL. 1142 (2000).

39. THINKING, *supra* note 2; KAHNEMAN, SLOVIC, & TVERSKY, *supra* note 2; Tversky & Kahneman, *supra* note 1.

40. Baruch Fischhoff, *Debiasing*, in JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 422 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982).

41. *Id.*

42. See, e.g., Lawrence J. Sanna & Norbert Schwarz, J. EXPERIMENTAL SOC. PSYCHOL.