

## Altering Attention in Adjudication

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### ABSTRACT

Judges decide complex cases in rapid succession but are limited by cognitive constraints. Consequently judges cannot allocate equal attention to every aspect of a case. Case outcomes might thus depend on which aspects of a case are particularly salient to the judge. Put simply, a judge focusing on one aspect of a case might reach a different outcome than a judge focusing on another. In this Article, we report the results of a series of studies exploring various ways in which directing judicial attention can shape judicial outcomes. In the first study, we show that judges impose shorter sentences when information concerning the cost of incarceration is made available to them. In the second study, we demonstrate that judges assess the credibility of expert witnesses more favorably when lawyers present an additional expert with similar, albeit notably weaker, credentials. In the third study, we show that the format in which prosecutors present forensic testimony can alter judges' assessments of that testimony's probative value. Finally, in the fourth study, we demonstrate that judges' willingness to ignore inadmissible evidence in a criminal case is affected by both the gravity of the crime and the severity of the police misconduct. In each of these studies, varying the context in which judges review evidence or altering the form in which that evidence is presented shifts judges' attention and alters their decisions.

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It's all about the choreography of people's attention . . . Attention is like water. It flows. It's liquid. You create channels to divert it, and you hope that it flows the right way.<sup>1</sup>

## INTRODUCTION

The “Last Resort Rule” advises lawyers that: “If you have the facts on your side, hammer the facts. If you have the law on your side, hammer the law. If you have neither the facts nor the law, hammer the table.”<sup>2</sup> The aphorism states the obvious, perhaps. But it also identifies a talent that superior lawyers generally possess—the ability to change the terms of the debate so as to win a case that cannot otherwise be won. We suspect that judges dislike this aphorism, because it suggests that lawyers’ efforts to control the courtroom agenda can successfully redirect a judge’s attention from the essence of a case. Judges want to make just and accurate decisions. The possibility that lawyers can trick them into making an erroneous ruling through superficial changes in terminology or by introducing red herrings is unsettling.

As unsettling as it might be to judges, the Last Resort Rule might be sound advice. The Rule dovetails with a fundamental lesson from social psychology concerning how to influence people’s judgment. Psychologists Lee Ross and Richard Nisbett assert that persuasion often occurs by changing the “object of judgment, not the judgment of the object.”<sup>3</sup> That is to say, it is easier to redirect people’s attention than to change their minds.

A famous experiment conducted by psychologist Solomon Asch illustrates this point.<sup>4</sup> Asch gave eight undergraduates the seemingly innocuous task of iden-

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1. Adam Green, *A Pickpocket's Tale: The Spectacular Thefts of Apollo Robbins*, NEW YORKER, Jan. 7, 2013, at 38, 41 (quoting Apollo Robbins, theatrical pickpocket and magician).
  2. Morton L. Janklow, *You Can Be Persuasive*, PARADE MAG., Dec. 29, 1985, at 8, 10.
  3. LEE ROSS & RICHARD E. NISBETT, THE PERSON AND THE SITUATION: PERSPECTIVES OF SOCIAL PSYCHOLOGY 69 (1991) (“[P]eople’s responses to an object are often less reflective of their long-held attitudes and values than of the way they happen to construe the ‘object of judgment’ on a given occasion.”). Ross and Nisbett attribute this observation to Solomon Asch. SOLOMON E. ASCH, SOCIAL PSYCHOLOGY 424 (1952) (“[T]here has been no change of evaluation, but rather a change in that which is being evaluated. The fundamental fact involves a change in the object of judgment, rather than in the judgment of the object.” (internal quotation marks omitted)).
  4. S. E. Asch, *Effects of Group Pressure Upon the Modification and Distortion of Judgments*, in READINGS IN SOCIAL PSYCHOLOGY 2, 3–6 (rev. ed. 1952) (describing the experiment and its results); see also

tifying which of three lines of notably different lengths was closest in length to a target line. The target line was identical in length to one of the three options, making the task seem incredibly easy—at least until the first seven participants chose the wrong line. In actuality, participant number eight was the only real subject in the experiment. The others were confederates of the experimenter who had been instructed to choose the wrong line. The real subjects commonly went along with the group's choice, even though it seemed erroneous. Although this study is often described as an illustration of the power of conformity,<sup>5</sup> it actually demonstrates how changing the object of judgment can alter behavior. The subjects did not conform to the group's choice because they were uncertain of the relative length of the lines. Rather, they conformed because they believed that if the others had chosen an answer that seemed obviously wrong, then the subjects must have misunderstood either the instructions or some other aspect of the task.<sup>6</sup> In effect, the seven confederates' confident but plainly erroneous answers changed the object of the subjects' judgment, transforming the task from one of visual perception into one of social perception and thereby altering the subjects' choices.

Advertisers have long taken advantage of the insight that consumer judgment can be influenced by similar kinds of misdirection of attention.<sup>7</sup> Tobacco companies, for example, produced cigarette advertisements promoting youth and hipness, not smoking.<sup>8</sup> Clothing lines and retailers market images of youth and beauty, not clothing. Beer commercials featuring attractive young people are quite transparently selling sex, not beer.

In this Article, we explore whether judges in courtrooms react like experimental subjects in psychological studies and like consumers confronted by Madison Avenue marketing tactics. We report the results of four experiments, each of which explores whether irrelevant context can redirect judges' attention and thereby alter their judgments. In the first study, we show that judges impose shorter sentences when information concerning the cost of incarceration is made available to them. In the second study, we demonstrate that judges assess the credibility of an expert witness more favorably when lawyers offer an additional

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Jeffrey J. Rachlinski, *The Limits of Social Norms*, 74 CHI.-KENT L. REV. 1537, 1551–53 (2000) (discussing interpretations of Asch's study).

5. See ROSS & NISBETT, *supra* note 3, at 33 (stating that the interpretation of Asch's research as showing that "people are sheep" represents the "conventional view" of this research).
6. See Lee Ross et al., *The Role of Attribution Processes in Conformity and Dissent: Revisiting the Asch Situation*, 31 AM. PSYCHOLOGIST 148, 149–50 (1976) (describing the dilemma of subjects in the Asch experiment as a difficulty with explaining the behavior of their peers).
7. See Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420, 1432–33 (1999) (discussing the efforts of advertisers to misdirect the public).
8. See *id.* at 1467–1552 (discussing advertising in the tobacco industry).

expert with similar, albeit notably weaker, credentials. In the third, we show that the format in which prosecutors present forensic testimony can alter judges' assessments of that testimony's probative value. Finally, we demonstrate that both the gravity of the crime and the severity of police misconduct affect judges' willingness to ignore inadmissible evidence in a criminal case.

Each of these experiments relies on data that we collected from judges attending judicial education conferences at which one or more of us made a presentation. Because we used presentation titles that were generic ("judicial decision making" was typical) the judges were not aware of what we were studying. Furthermore, most of our sessions were not optional parts of the program, so we are confident that judges did not select our session out of interest in psychology. At the outset of each presentation, we asked the judges to respond to a multipage survey. The surveys included several questions, most of which asked the judges to rule on hypothetical cases. As we describe below, the judges were randomly assigned to one of up to six slightly different versions of each case, enabling us to conduct between-subject experiments. We informed the judges that responding to the surveys was voluntary and that their responses would be anonymous. We did request, however, that the judges provide demographic information at the end of the survey, including their title (to ensure that they were a judge), their years of experience as a judge, their general political orientation (Republican, Democrat, or other), and their gender.<sup>9</sup> We also afforded judges the opportunity to complete the survey for pedagogic purposes but to exclude the use of the survey in any further research. Nearly all of the judges who attended our presentations completed the voluntary survey and authorized us to use their results in the research described below. In each session, we compiled the results quickly and presented aggregated results back to the judges who had completed the surveys.

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9. We have successfully used this methodology for over a decade. See Chris Guthrie et al., *Blinking on the Bench: How Judges Decide Cases*, 93 CORNELL L. REV. 1, 13–14 (2007) [hereinafter Guthrie et al., *Blinking on the Bench*]; Chris Guthrie et al., *Inside the Judicial Mind*, 86 CORNELL L. REV. 777, 786–87 (2001); Chris Guthrie et al., *Judging by Heuristic: Cognitive Illusions in Judicial Decision Making*, 86 JUDICATURE 44, 45–46 (2002); Chris Guthrie et al., *The "Hidden Judiciary": An Empirical Examination of Executive Branch Justice*, 58 DUKE L.J. 1477, 1492–94 (2009); Jeffrey J. Rachlinski et al., *Contrition in the Courtroom: Do Apologies Affect Adjudication?*, 98 CORNELL L. REV. 1189 (2013); Jeffrey J. Rachlinski et al., *Does Unconscious Racial Bias Affect Trial Judges?*, 84 NOTRE DAME L. REV. 1195, 1205–06 (2009); Jeffrey J. Rachlinski et al., *Inside the Bankruptcy Judge's Mind*, 86 B.U. L. REV. 1227, 1232 (2006); Jeffrey J. Rachlinski et al., *Probable Cause, Probability, and Hindsight*, 8 J. EMPIRICAL LEGAL STUD. 72, 76–78 (2011) [hereinafter Rachlinski et al., *Probable Cause*]; Andrew J. Wistrich et al., *Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding*, 153 U. PA. L. REV. 1251, 1281–84 (2005); Andrew J. Wistrich & Jeffrey J. Rachlinski, *How Lawyers' Intuitions Prolong Litigation*, 86 S. CAL. L. REV. 571 (2013).

## I. TRUTH IN SENTENCING

Decades ago, economist Gary Becker argued that societies should try to optimize the costs and benefits of incarceration.<sup>10</sup> To Becker, the benefits consist largely of deterrence, while the costs include the lost productivity associated with confinement and, of course, the cost of prison infrastructure.<sup>11</sup> Most scholars, judges, and the public, however, believe that criminal sentences should be based on retributive goals rather than Becker's utilitarian goals.<sup>12</sup> That is, when judges, jurors, and most citizens assess criminal sentences, they likely weigh the crime committed, the defendant's criminal history, the defendant's personal history, and the attitude the defendant expresses towards the crime and the victims.<sup>13</sup> The cost of incarceration is not typically a factor. Although legislatures might consider such concerns in setting sentencing ranges,<sup>14</sup> the cost of incarceration typically plays no direct role in sentencing hearings.<sup>15</sup>

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10. Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 170 (1968) ("The optimal amount of enforcement is shown to depend on, among other things, the cost of catching and convicting offenders, the nature of punishments—for example, whether they are fines or prison terms—and the responses of offenders to changes in enforcement.").
  11. *See id.* at 170–72; *see also* David S. Abrams, *The Prisoner's Dilemma: A Cost-Benefit Approach to Incarceration*, 98 IOWA L. REV. 905, 946–52 (2013) (analyzing the direct and indirect costs of incarceration).
  12. *See* Douglas A. Berman & Stephanos Bibas, *Making Sentencing Sensible*, 4 OHIO ST. J. CRIM. L. 37, 39 (2006) (discussing the factors that may appropriately be considered in imposing sentence); Michael T. Cahill, *Retributive Justice in the Real World*, 85 WASH. U. L. REV. 815, 821 (2007) (discussing whether the criminal justice system should consider social consequences when determining a sentence).
  13. *See* GEORGE P. FLETCHER, BASIC CONCEPTS OF CRIMINAL LAW 32 (1998) ("[T]he notion that suffering of the offender can negate the suffering caused by the offense continues to resonate in our intuitions of justice."); *id.* at 38 ("According to the ethics of the Bible, those who 'stand idly by' are charged with blood guilt. Similarly today, we are inclined to see the failure to punish as a form of complicity that falls on those who abandon the victim to his or her 'private' tragedy."); *see also* 18 U.S.C. § 3553(a) (2006) (identifying factors used in federal sentencing).
  14. Of course, sentencing costs could be incorporated into the sentencing process in other ways. For example, the aggregate costs of sentencing could be summarized in a criminal justice system's annual report. That method, however, would not make the information salient to judges at the time of sentencing, thus making it difficult for them to use in determining particular sentences. The fact that the state spent millions of dollars on its department of corrections tells the judge nothing about what a particular sentence will cost or how the cost of one sentence compares to that of another. Similarly, a state could reclassify some crimes to make them ineligible for incarceration or adjust sentencing guidelines to reduce recommended sentences. *See* Abrams, *supra* note 11, at 913–14. This approach would obviate the need for judges to contemplate relative sentencing costs, as such consideration would occur on a system-wide level. Judges might nonetheless continue to consider these costs, even if directed to ignore them. *See* Wistrich et al., *supra* note 9, at 1275–76.
  15. Chad Flanders, *Cost and Sentencing: Some Pragmatic and Institutional Doubts*, 24 FED. SENT'G REP. 164, 165 (2012) [hereinafter Flanders, *Institutional Doubts*] ("The goal of saving money seems to be a different kind of goal than the traditional penological ones of preventing, deterring, and justly punishing crime."); *id.* at 166 ("Cost, considered solely as the *financial* cost of a punishment, is

In one state, however, attention to the social costs of incarceration has come to play a more prominent role in sentencing in recent years.<sup>16</sup> Concerned about the impact of a swelling prison population on the state budget, Missouri took steps to reduce the state's ineffective reliance on incarceration.<sup>17</sup> In 2010, the state began including information regarding the cost of various sentencing options in Sentence Advisory Reports (SARs) produced by the Missouri Sentencing Advisory Commission (MOSAC) to assist judges in determining the appropriate sentence.<sup>18</sup> For example, MOSAC announced that it would supply the sentencing judge with the following cost information for a hypothetical offender convicted of second-degree robbery, which carries a maximum sentence of fifteen years under Missouri law:

Mitigating Sentence: Probation: 5 years probation @ \$1,354  
per year.

Total Cost = \$6,770

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largely exogenous to the traditional rationales for punishing people: rehabilitation, deterrence, and especially retribution.”). Some federal courts of appeal have explicitly rejected the notion that the cost of a sentence should be considered in determining the appropriate sentence. *See, e.g.*, *United States v. Molina*, 563 F.3d 676, 678 (8th Cir. 2009) (“[W]e doubt that sentencing courts have the authority to impose lesser sentences based on the cost of imprisonment.”); *United States v. Tapia-Romero*, 523 F.3d 1125, 1126 (9th Cir. 2008) (“Congress has not made the cost to society of a defendant’s imprisonment a factor [that] a sentencing judge should consider under [18 U.S.C.] § 3553(a) in determining the appropriate term of imprisonment under 18 U.S.C. § 3582(a).”); *United States v. Wong*, 127 F.3d 725, 728 (8th Cir. 1997) (“The decision whether tax dollars should be used to pay for lengthy sentences is a congressional determination, not one to be made by federal courts.”). Conversely, others have encouraged judges to consider cost as a factor, at least some of the time. *See* Chad Flanders, *Cost as a Sentencing Factor: Missouri’s Experiment*, 77 MO. L. REV. 391, 395 (2012) [hereinafter Flanders, *Missouri’s Experiment*] (“Judges and attorneys may argue cost at sentencing hearings, and many of them do.”). Notably, judges are provided with cost information in other criminal justice contexts. For example, federal judges are encouraged to consider—along with the usual factors such as risk of danger to the community and risk of nonappearance—the relative cost of pretrial detention, release on bond, and various forms of postrelease monitoring.

16. Monica Davey, *Missouri Tells Judges Costs of Sentences*, N.Y. TIMES, Sept. 18, 2010, <http://www.nytimes.com/2010/09/19/us/19judges.html> (“Long missing [in the criminal justice system] has been a sober realization that even if we get significant benefits from incarceration, that comes at a significant cost.” (quoting Douglas A. Berman)); Heather Ratcliffe, *Missouri Judges Get Penalty Cost Before Sentencing*, ST. LOUIS POST-DISPATCH (Sept. 14, 2010), [http://www.stltoday.com/news/local/crime-and-courts/missouri-judges-get-penalty-cost-before-sentencing/article\\_924097a5-9f4d-54bb-80ca-4cc4160dde7c.html](http://www.stltoday.com/news/local/crime-and-courts/missouri-judges-get-penalty-cost-before-sentencing/article_924097a5-9f4d-54bb-80ca-4cc4160dde7c.html) (reporting the view of Cathy Kelly of the Missouri Public Defender System that the “state is going bankrupt” and that judges need to know about “cost-effective options besides prison”).
17. Apparently, Missouri is the only state that breaks down the cost of sentencing alternatives on a defendant-by-defendant basis. *See* Ratcliffe, *supra* note 16 (“I don’t know of any state doing this except Missouri.” (quoting Barbara Tombs of the Washington, D.C., Sentencing Commission)).
18. *See* Flanders, *Missouri’s Experiment*, *supra* note 15, at 391–92.

Presumptive Sentence: Community Structured Sentence: 5 years enhanced probation @ \$1,792 per year.

Total Cost = \$8,960

Aggravating Sentence: Prison: 5 years prison assuming expected actual time served 62 percent = 3.1 years in prison @ \$16,823 per year + remaining sentence of 1.9 years on parole @ \$1,354 per year.

Total Cost = \$54,724<sup>19</sup>

The attempt to make the cost of incarceration salient represents an intentional shift of the sentencing paradigm from a retributive scheme to a social welfare scheme.<sup>20</sup> Missouri's system attempts to nudge judges to weigh social costs along with the usual retributive goals, just as Becker suggested decades ago.<sup>21</sup> Missouri has conducted no analysis of the effects of this shift,<sup>22</sup> however, and forecasts conflict. Some have predicted that providing judges with information about the cost of sentences will reduce the length of sentences, while others have suggested that it will have little or no impact.<sup>23</sup>

19. *Sentencing Information on www.mosac.mo.gov Now Includes Costs of Recommended Sentences and Risks of Reincarceration*, SMART SENT'G, Aug. 17, 2010, <http://www.mosac.mo.gov/file.jsp?id=45502>.

20. Flanders, *Missouri's Experiment*, *supra* note 15, at 393 ("The debate over the inclusion of cost figures in sentencing reports is part of the larger question of what factors are appropriate for a judge to consider when sentencing. Should a judge include considerations of the social cost of certain forms of punishment when deciding a sentence, or does that mean the sentence is no longer tailored to the individualized facts of the crime and the criminal? The question of including sentence cost also raises an issue central to modern retributivist theory: to what extent can the criminal justice system and the various parties in it consider societal consequences in determining a sentence? Should the right punishment be given to the offender, even if important social programs remain unfunded?" (footnotes omitted)).

21. See Becker, *supra* note 10, at 207–09; Jeff Milyo, "Cost as a Sentencing Factor": *A Response*, 77 MO. L. REV. 411, 414 (2012) ("By including sentencing costs in SARs, MOSAC is trying to nudge judges to issue less punitive sentences than they would if cost information was issued in an annual report."); see also Davey, *supra* note 16 ("The intent behind the cost estimates . . . [Robert P. McCulloch, the prosecuting attorney for St. Louis County] said, is transparent: to pressure judges, in the face of big bills, into sending fewer people to prison.").

22. Telephone Interview by Irma Vargas of Julie Upschulte of MOSAC (Jan. 15, 2013).

23. See Flanders, *Institutional Doubts*, *supra* note 15, at 167 ("The Commission is right to highlight the problems facing the criminal justice system, and the increasing cost of punishment has a good claim to be problem number one. But it is an open question (in part, an open empirical question) whether letting judges use cost as a sentencing factor is the best way to go about trying to reduce the cost of criminal justice, and whether it will cause more harm than good."); Flanders, *Missouri's Experiment*, *supra* note 15, at 396 ("Jail time is expensive, as the Missouri Sentencing Commission shows, and if judges take into account cost, then they might lower sentences because they cost too much. It is hard to imagine that a judge will increase a sentence in order to spend more money. Rather, a judge, knowing the cost of a longer sentence, would only be impelled to impose a longer

To attempt to answer this question, we asked 133 judges attending the annual meeting of the American Judges Association in September 2010 to sentence a hypothetical defendant identified as “Hector Campbell, an unemployed drummer.” The judges were split into two groups—one received a scenario charging Hector with possession of cocaine, while the second received a scenario charging Hector with rape. The materials indicated that “Hector is twenty-four-years-old and has a high school diploma and a spotty employment record.” A complete copy of the materials is included as Appendix A.

The first group of judges received materials stating that Hector had been “arrested at a party for allegedly possessing a two-ounce bag of cocaine. Hector was charged with drug possession. The evidence at trial, which included testimony from an undercover police officer and two other witnesses, showed convincingly that he had cocaine in his possession.” These judges also learned that Hector had “one prior conviction for possession of marijuana” and that the maximum sentence for possession of cocaine under these circumstances was eight years.

The second group’s materials stated that Hector “was arrested at a party for allegedly raping his ex-girlfriend at knifepoint. Hector was charged with rape. The evidence at trial, which included testimony from the [ex-] girlfriend and two other witnesses, showed convincingly that he did commit the rape.” These judges learned that Hector had “one prior conviction for assault and battery” and that the maximum sentence for rape under these circumstances was twenty-five years.

To test the effect that providing the cost of incarceration might have on sentencing, we created three different versions of the hypothetical for each of the two types of crimes. For one-third of the judges, we provided no information on the cost of incarceration. For another third of the judges, the materials stated: “You have learned from your jurisdiction’s sentencing advisory commission that Hector’s incarceration will cost the state \$15,500 per year or [\$124,000/\$387,500] if he were to serve a maximum sentence.” For the final third of the judges, we

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sentence in spite of the greater cost of that sentence. So the intuition that cost is an irrelevant factor naturally suggests that it would be wrong for a judge to decrease someone’s sentence or to give that person a different type of punishment than was appropriate because it would cost the state too much money.” (footnote omitted). *But see* Davey, *supra* note 16 (“This is one of a thousand things we look at—about the tip of a dog’s tail, it’s such a small thing. But it is almost foolish not to look at it. We live in a what’s-it-going-to-cost? society now.” (quoting Judge Gary Oxenhandler, presiding judge of the 13th Judicial Circuit Court of Missouri)); Ratcliffe, *supra* note 16 (“They are always happy to have more information. . . . But cost is not something they would consider when making a decision about sentencing.” (quoting Paul Fox, administrator for the St. Louis County Circuit Court)).

described the cost of incarceration as “\$31,000 per year or [\$248,000/\$775,000] if he were to serve a maximum sentence.”<sup>24</sup>

In effect, the materials created a 2x3, between-subjects design;<sup>25</sup> judges received either a drug possession case or rape case, and were provided with either no information on prison cost (the control condition), information that the cost would be \$15,500 per year (low-cost condition), or information that the cost would be \$31,000 per year (high-cost condition). We asked all the judges to indicate what sentence they would impose on Hector. Three judges did not provide a sentence, leaving 130 judges across six conditions.

TABLE 1. Average Sentence by Crime and Cost of Sentence Information (and N)

Crime	Cost of Sentencing Information		
	None	\$15,500/year	\$31,000/year
Possession	1.9 (15)	2.5 (24)	3.0 (22)
Rape	16.7 (23)	18.0 (18)	12.4 (28)

Table 1 reports the average sentence in each of the six conditions. Analysis of variance (ANOVA) of the results revealed significant main effects of the type of crime,<sup>26</sup> sentence cost information,<sup>27</sup> and the interaction of crime and sentence cost information.<sup>28</sup> To assess the meaning of the interaction term, we conducted separate ANOVAs on the two crimes. This analysis revealed that the sentencing cost information had no significant effect on the sentences for possession.<sup>29</sup> The sentence cost information, however, significantly affected the sentences the judges assigned in the rape case.<sup>30</sup> Post hoc tests (Scheffe’s) showed that the average sentence in the high-cost condition was significantly lower than the average sentence in the low-cost condition and significantly lower than the average sentence in the control condition; furthermore, the average sentences in the control condition and in the low-cost condition did not differ significantly from each other.

24. The costs we provide are realistic. Two recent studies of the average cost of incarceration per inmate concluded that the national average was about \$31,000, with the cost per state varying from a low of about \$15,000 to a high of about \$50,000. See Abrams, *supra* note 11, at 946–47 (citing CHRISTIAN HENRICHSEN & RUTH DELANEY, VERA INST. OF JUSTICE, THE PRICE OF PRISONS: WHAT INCARCERATION COSTS TAXPAYERS (2012) and PEW CTR. ON THE STATES, ONE IN 100: BEHIND BARS IN AMERICA (2008)).

25. See ROBERT M. LAWLESS ET AL., EMPIRICAL METHODS IN LAW 104 (2010).

26. ( $F(1, 124)=257.9, p < .001$ ).

27. ( $F(2, 124)=3.44, p < .05$ ).

28. ( $F(2, 124)=5.99, p < .005$ ).

29. ( $F(2, 58)=0.93, p = .40$ ).

30. ( $F(2, 66)=5.91, p < .005$ ).

These results were surprising. Like the architects of the Missouri experiment intended,<sup>31</sup> and others had predicted,<sup>32</sup> we expected that the victimless-crime aspect of the possession charge would make the judges more sensitive to the cost of incarceration, while the horror of the rape at knife point would maintain the judges' focus on retributive ends. Contrary to our expectations, however, the cost information had no impact on sentences in the drug possession scenario, even though the cost information strongly influenced sentencing in the rape scenario. Specifically, judges evaluating the rape scenario who were informed that incarceration cost \$31,000 annually imposed sentences that were roughly one-third shorter than the sentences imposed by judges who were told that the cost of incarceration was only \$15,500.

Two possibilities might account for this pattern of results. First, the judges might have focused intently on the cost of sentencing when it was provided, as it is a novel fact for most judges. Because the cost of incarceration in the rape case was so much larger than in the drug possession case, the sheer magnitude of the cost might have driven down sentences. Secondly, the judges' willingness to consider cost information might have been at least partly attributable to the hypothetical nature of our study. The lack of detail and the absence of a real victim and defendant might have encouraged the judges to focus on cost considerations. Judges might be less influenced by cost information in actual cases, or they might even display the pattern that we originally predicted.

Despite some uncertainty, these results suggest that providing information concerning the cost of incarceration can shift a judge's focus away from the nature of a crime and toward the direct financial cost of incarceration to society. Al-

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31. William Ray Price Jr., Chief Justice, Supreme Court of Mo., State of the Judiciary Address (Feb. 3, 2010), available at <http://www.courts.mo.gov/page.jsp?id=36875> ("Let me be clear: violent offenders need to be separated from us so they cannot hurt innocent men, women or children, regardless of the cost. I am not talking about them. I am talking about nonviolent offenders.").

32. See Flanders, *Institutional Doubts*, *supra* note 15, at 166 (suggesting the possibility that a judge "may use cost only in minor cases, and ignore cost altogether when it comes to violent offenses or serious property crimes"); *id.* at 165 ("Or consider another possibility. Perhaps those cases where the cost savings would be the greatest are those cases where judges will be least likely to let cost make a difference. More serious crimes, such as murder or armed robbery, would probably fall into this category. For a judge sentencing in such a case, the idea that the cheaper sentence should win out *because it is cheaper* will seem anathema. This could be another way in which cost will only do at best minimal work, because in the most serious cases, cases where the price difference between many years in prison and many years on probation is great, cost will be bracketed. Only time and further study will tell if this is what happens. But there seem to be some plausible reasons to doubt that the reform will have any but a modest impact on reducing the cost of sentences, or in making sentencing more cost effective." (footnote omitted)).

though judges are aware that the state funds prisons, our study suggests that making the cost of incarceration salient can dramatically alter criminal sentences.<sup>33</sup>

## II. THE CONTRAST EFFECT

Ugly Friend—A friend a person brings with him/her to a gathering/event in order to make him/herself appear more attractive in comparison.<sup>34</sup>

The contrast effect is one of the most pervasive phenomena in the psychological literature on judgment and choice.<sup>35</sup> The addition of an extraneous item to a choice set can alter a person's evaluation of the other items in that choice set by providing a misleading comparison set or contrast.<sup>36</sup> For example, researchers in one study found that subjects were more likely to prefer receiving a Cross pen to a six-dollar payment when a clearly inferior pen was added to the choice set.<sup>37</sup> Preferring the Cross pen to the six dollars or the six dollars to the Cross pen are both defensible choices, but one's choice between those two options should not be altered by the availability of a clearly inferior option. As one scholar put it, "a person who prefers chicken over pasta should not change this preference on learning that fish is also available."<sup>38</sup>

The contrast effect defies logic by violating what is known as the constant ratio rule, which states that "the relative proportion of choices made between two options should be the same regardless of whether they are presented on their own or in the presence of a third, less preferred option."<sup>39</sup> Thus, the contrast effect undermines the widely held assumption that preferences are invariant.<sup>40</sup>

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33. We note that our experiment does not perfectly track the Missouri experience, since the MOSAC also furnished judges with aggregate statistical information regarding the relative likelihood of recidivism following each type of sentence. See *Sentencing Information on www.mosac.mo.gov Now Includes Costs of Recommended Sentences and Risks of Reincarceration*, *supra* note 19, at 1.
  34. *Ugly Friend Definition (5)*, URB. DICTIONARY, <http://www.urbandictionary.com/define.php?term=ugly+friend> (last visited July 17, 2013).
  35. See, e.g., Itamar Simonson & Amos Tversky, *Choice in Context: Tradeoff Contrast and Extremeness Aversion*, 29 J. MARKETING RES. 281, 281 (1992) ("Contrast effects are ubiquitous in perception and judgment.").
  36. See *id.* at 282, 285–87 ("In deciding whether or not to select a particular option, people commonly compare it with other alternatives . . .").
  37. *Id.* at 287 (reporting results).
  38. Mark Kelman et al., *Context-Dependence in Legal Decision Making*, 25 J. LEGAL STUD. 287, 287 (1996).
  39. Tanya Latty & Madeleine Beekman, *Irrational Decision-Making in an Amoeboid Organism: Transitivity and Context-Dependent Preferences*, 278 PROC. ROYAL SOC'Y B 307, 308 (2010); see also Amos Tversky, *Elimination by Aspects: A Theory of Choice*, 79 PSYCHOL. REV. 281, 292 (1972) ("The constant-ratio rule is a strong version of the principle of independence of irrelevant alternatives.").
  40. See Simonson & Tversky, *supra* note 35, at 281.

The contrast effect works by shifting attention. When people choose between the Cross pen and six dollars, they are evaluating the Cross pen in terms of its cash value. When the cheap pen becomes available, however, they assess the Cross pen in terms of its value as a pen compared to an inferior pen—which makes the Cross pen appear more valuable.<sup>41</sup> People may not know whether they prefer a Cross pen or six dollars, but they do know that they prefer a Cross pen to a cheap pen. Thus, the nature of the inquiry changes when the cheap pen is available. The contrast between the two pens provides a dimension on which the Cross pen is clearly superior. People might be unsure whether the Cross pen is more useful than six dollars, but they can be certain that the Cross pen is more valuable than the cheap pen. This contrast provides an additional basis for preferring the Cross pen to the six dollars.<sup>42</sup>

The need to support and defend one's choice is so powerful that people can be induced to pay more for less of a desirable commodity because of the way in which the commodity is presented.<sup>43</sup> In one study, for example, one group of subjects indicated that they would pay \$2.26 for seven ounces of ice cream in a five-ounce cup, while another group of subjects indicated that they would pay only \$1.66 for eight ounces of ice cream in a ten-ounce cup.<sup>44</sup> People were willing to pay more for less because an overflowing small cup of ice cream appeared to be a better deal than the underfilled large cup.

The contrast effect has also been documented in legal settings.<sup>45</sup> For example, researchers have found that defendants can induce plaintiffs to settle a case by presenting two settlement options, one of which is clearly inferior to the other (just as the availability of the inferior pen made the Cross pen seem more attractive).<sup>46</sup> Similarly, a study by Sunstein, Kahneman, Schkade & Ritov showed that mock jurors will implicitly compare types of injuries in assigning punitive

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41. See Latty & Beekman, *supra* note 39; see also Tversky, *supra* note 39 (“The constant-ratio rule is a strong version of the principle of independence from irrelevant alternatives.”).

42. See Christopher K. Hsee, *The Evaluability Hypothesis: An Explanation for Preference Reversals Between Joint and Separate Evaluations of Alternatives*, 67 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 247, 249–55 (1996) (describing a series of studies showing that people evaluate items based on their easy-to-evaluate traits unless they are able to make a comparison to a similar item on a harder-to-evaluate trait).

43. See Christopher K. Hsee, *Less Is Better: When Low-Value Options Are Valued More Highly Than High-Value Options*, 11 J. BEHAV. DECISION MAKING 107, 108, 118 (1998) (presenting “a series of studies where a normatively less valuable option is judged more favorably than its more valuable alternative—a phenomenon to be referred to as the ‘less-is-better’ effect” and concluding that an easy-to-evaluate attribute will have a disproportionate effect on choice).

44. *Id.* at 111–13.

45. Kelman et al., *supra* note 38, at 297–99.

46. Chris Guthrie, *Panacea or Pandora's Box?: The Cost of Options in Negotiation*, 88 IOWA L. REV. 601, 620–21 (2003).

damages.<sup>47</sup> In that study, subjects were asked to assign punitive damages in two different cases—one involving a particularly egregious financial crime and another involving minor physical injury. The authors found that when subjects evaluated these cases *separately* they assigned higher punitive damage awards in cases of particularly egregious financial crimes than in cases of intentionally inflicted minor physical injuries. This pattern reversed, however, when the subjects evaluated both cases together. The authors reasoned that when the subjects evaluated the cases separately, they implicitly compared each case to what they perceived as a typical version of the same type of injury. Because the egregious financial harm was so much worse than the typical financial injury, it thus produced a high award. Conversely, because the physical injury was relatively minor, it produced a low award. Presenting both cases together, however, caused the subjects to recognize that the physical harm was more serious than the financial harm. The subjects' assignment of punitive damage awards matched this perception. By presenting the cases together, rather than separately, the authors effectively changed the comparison that the subjects were making and thereby changed the focus of the subjects' attention.

Are judges susceptible to the contrast effect? Can they be induced to prefer the Cross pen and the ice cream in the smaller cup? In a comment on the Kahneman, Schkade & Sunstein study, Eisenberg, Rachlinski & Wells showed that actual cases track the pattern that Kahneman et al.'s study suggests, in jury trials but not in bench trials.<sup>48</sup> Because judges have much more experience in awarding damages than do lay jurors, they also apparently have a more stable sense of how to evaluate injuries.

To explore further whether judges manage to resist the contrast effect, we asked Florida trial judges to evaluate a hypothetical case designed to elicit the phenomenon. The judges were attendees at a statewide annual judicial education conference for Florida Circuit Court judges in June 2006. Our materials asked the judges to evaluate the relative credibility of expert witnesses. The scenario described a child-custody dispute as follows:

Imagine that you are presiding over a child custody dispute in which the husband and wife are at odds over the custody of their 11-year-old son, Jeremy. The husband and wife are both competent parents, but their relationship with each other is profoundly strained. They have rejected a joint custody relationship and are each seeking sole custody of Jeremy (though the other parent would retain visitation rights).

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47. Cass R. Sunstein et al., *Predictably Incoherent Judgments*, 54 STAN. L. REV. 1153, 1174–78 (2002).

48. Theodore Eisenberg et al., *Reconciling Experimental Incoherence With Real-World Coherence in Punitive Damages*, 54 STAN. L. REV. 1239, 1245–56 (2002).

Both the husband and the wife have retained experts to testify as to the custodial arrangement that would serve Jeremy's "best interests." Based solely on the information provided below, which of the following experts would you deem to be most credible (please select one only):

The materials then described the expert witnesses. We randomly assigned the judges to one of two conditions: a control condition and a contrast condition. In the control condition, the judges chose between two experts—one working on behalf of the wife (Dr. Henry, a psychologist) and one on behalf of the husband (Dr. Williams, a psychiatrist)—who were designed to be of roughly comparable quality. In the contrast condition, the judges chose from among those two experts (Dr. Henry and Dr. Williams) as well as a second expert retained by the husband (Dr. Hancock, a psychiatrist). The additional expert retained by the husband (Dr. Hancock) was also a psychiatrist, but he had vastly inferior qualifications than the husband's first expert (Dr. Williams). He was, in other words, the equivalent of the cheap pen in this study.

The materials described the two comparable experts as follows:

**Wife's Expert**—Dr. Henry is a licensed psychologist with a B.A. in Psychology from Stanford and a Ph.D. in Clinical Psychology from the University of Michigan. Dr. Henry has practiced as a clinical psychologist for 20 years in the District of Columbia, working primarily with children and families. Dr. Henry has testified as an expert in 15 child custody cases, seven times for the wife and eight times for the husband. In this case, Dr. Henry will testify that the wife should get custody.

**Husband's Expert**—Dr. Williams is a licensed psychiatrist with a Bachelor's Degree in Biology and an M.D. from Emory University. Following medical school, Dr. Williams completed a psychiatric residency and has since practiced psychiatry for 10 years in the Miami area, working primarily with children and families. Dr. Williams has testified as an expert in ten child custody cases, four times for the husband and six times for the wife. In this case, Dr. Williams will testify that the husband should get custody.

The husband's additional expert, who was included only in the contrast condition, was described as follows:

**Husband's Expert**—Dr. Hancock is a psychiatrist with a B.A. in Psychology from the University of Mississippi and an M.D. from St. George's University School of Medicine in Grenada. Dr. Hancock has never been admitted to practice medicine in the United States. Dr. Hancock has, however, testified as an expert in 37 prior child custody

cases, each time for the husband. In this case, Dr. Hancock will testify that the husband should get custody.

Of the 144 judges who reviewed this problem,<sup>49</sup> six did not respond.<sup>50</sup> None of the judges in the contrast condition identified the husband's second psychiatrist (Dr. Hancock) as the most credible. The addition of the weak expert, however, made the husband's first psychiatrist (Dr. Williams) seem more credible.<sup>51</sup> In the control condition, 54 percent (38 out of 70) of the judges identified the husband's first psychiatrist (Dr. Williams) as more credible than the wife's psychologist. In the contrast condition, however, 72 percent (49 out of 68) of the judges made this choice. This difference was statistically significant.<sup>52</sup>

Judges, it seems, are no different from ordinary consumers in that they are vulnerable to the contrast effect. Evaluating the relative credibility of expert witnesses is challenging, particularly since we did not provide their testimony or any details other than their qualifications. But the judges in our study could easily tell that one of the husband's psychiatrists (Dr. Williams) was more qualified than the other (Dr. Hancock). In effect, the addition of this inferior expert changed the object of judgment, shifting the judges' focus from a comparison of each party's expert to a comparison of the husband's two experts. Because one of the husband's experts appeared clearly superior to the other, the judges' assessment of the husband's first expert increased markedly.

Although we found strong evidence that a contrast effect influenced the judges in gauging the relative credibility of expert witnesses, we conducted another study in which we were unable to elicit contrast effects in judges. In the second

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49. This was roughly half of the judges in attendance at the conference. We varied our materials slightly so that half of the judges responded to this problem and the other half responded to an unrelated scenario.

50. Four in the control condition and two in the contrast condition did not respond.

51. We originally presented this problem to a group of judges at an educational conference in another jurisdiction. In the original version, we identified the wife's expert as the psychiatrist and the husband's experts as psychologists, one of which had vastly inferior qualifications to the other. In that version, we encountered a kind of ceiling effect: In the control condition, 84 percent of the judges (26 out of 31) chose the husband's expert as more credible, and, after the addition of an inferior expert, 93 percent (28 out of 29) of judges found the husband's first expert most credible. This difference was not statistically significant (Fisher's exact test,  $p = .20$ ), because the control condition percentage was so high that a statistically significant difference in the contrast condition was virtually impossible. Many of the judges informed us that they believed psychologists were better witnesses in such cases, so in later studies we rewrote the expert's qualifications to make the choice in the control condition a closer call.

52. Fisher's exact test,  $p = .035$ . If we combine the results from the similar, original version of the problem described in *supra* note 51, and this version, the combination also produces a significant contrast effect, with 63 percent (64 out of 101) choosing the husband's expert in the control condition as compared to 79 percent (77 out of 97) in the contrast condition. Fisher's exact test,  $p = .01$ .

study, we asked federal judges attending an educational conference sponsored by the Federal Judicial Center to evaluate two settlement offers.<sup>53</sup>

The case consisted of a civil rights claim by an African-American high school honors student who had been shot in the back by a security guard at a public university where he was taking classes.<sup>54</sup> The materials indicated that the university offered the plaintiff a choice between: a \$1.5 million payment plus a commitment to fire the security guard, and a \$3 million payment without a commitment to fire the security guard. Because the plaintiff was a minor, the judge had to approve any settlement.

The judges learned that the student wanted to accept the lesser sum to ensure that the guard would get fired. The materials ultimately asked the judge whether they would allow the plaintiff to accept the lesser sum. Half of the judges also learned that the university initially had been willing to offer \$1.5 million and only a suspension of the guard.<sup>55</sup> Because this offer is comparable but inferior to

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53. The forty-two judges included forty-one U.S. magistrate judges and one U.S. District judge.

54. The facts of the scenario, labeled "Settlement Problem," consisted of the following:

You are presiding over a settlement conference in a lawsuit filed by a minor, Henry Johnson, against Ted Samuelson, a campus police officer employed by the State University. The suit includes a claim under 42 U.S.C. § 1983 and state law tort claims. The University will indemnify Samuelson and has assumed the defense of this action.

Johnson is a 16-year-old African-American from a poor neighborhood. He lives with his four younger siblings and his mother, who works as a hotel maid. He has not seen his father in many years. In January of Johnson's junior year in high school, he began taking some classes at the local University, through a special program offered to honor students.

While returning from the University library late one evening, Johnson was stopped by Officer Samuelson. Samuelson began questioning Johnson aggressively in connection with an armed robbery. Nervous and frightened, Johnson ran off. Samuelson shouted at him to stop. When Johnson kept running, Samuelson shot Johnson in the back. The bullet damaged Johnson's spinal cord leaving him permanently unable to walk. The incident has left Johnson bitter and angry. He is nonetheless determined to complete his classes at the University (which is the best public college in the state) and perhaps enroll as a full-time student after high school.

Johnson's mother is his guardian ad litem. Between her job, managing Johnson's injuries, and caring for her other four children, however, she is overwhelmed. She is counting largely on others to do the best for her son, and will approve any decision her son and his attorney make. Johnson's lawyer seems competent, but is inexperienced. Neither side has actively pursued discovery, and both seem interested in settling. Criminal charges against Samuelson for the shooting were dropped after a brief investigation.

55. This was described as follows:

In a previous settlement conference, Johnson insisted that the Officer Samuelson be disciplined and the University initially refused. After protracted discussions, the University reluctantly offered to pay Johnson \$1.5 million and to suspend Samuelson for three months without pay. Johnson rejected that offer, and you adjourned the conference to give the parties a chance to reconsider their positions.

the final offer of \$1.5 million plus firing the guard, we believed it would make the \$1.5 million appear to be more favorable to the judges.

All forty-two judges at the conference answered the question, but they did not display a contrast effect.<sup>56</sup> In the control condition, 47.6 percent (10 out of 21) indicated that they would allow the plaintiff to accept the \$1.5 million settlement, as compared to 38.1 percent (8 out of 21) in the contrast condition. Thus, the addition of the earlier, less favorable settlement offer seemingly made the comparable settlement option slightly less attractive, although this difference was not statistically significant.<sup>57</sup>

Although we think it important to report this failure to replicate the contrast effect in a different setting, we do not believe that it undermines the basic conclusion that judges are vulnerable to the contrast effect. We modeled the settlement study after contrast effects studies conducted by Kelman and his coauthors<sup>58</sup> and by Guthrie.<sup>59</sup> In those studies, the addition of an inferior choice boosted acceptance of the choice that it most closely resembled. Unlike those studies, however, we did not offer the judges the inferior choice as a third option in our study because we felt that our version more accurately reflected the way in which such settlement proposals are actually structured. The contrast effect, however, might require that the inferior option remain available as a choice. Furthermore, our sample size was small relative to those used in other studies, giving us only a limited ability to detect any effects. It is also possible that the role in which we placed judges undermined the effect. Judges were not selecting their preferred choice but instead were deciding whether to approve or reject the litigant's decision. Although we believe that the contrast effect should have improved the desirability of the option that the litigant chose, it could be that the judges were focused on a different object of judgment—the maturity of the litigant.

Overall, our research suggests that, at least in some settings, judges are vulnerable to the contrast effect. This result suggests an insidious litigation strategy—proffer a weak expert to make your good expert look better. That sounds ridiculous, but in real-world settings other than the courtroom, professionals use the contrast effect in ways that seem equally silly. For example, real estate agents reportedly show their clients houses that are wildly inferior on some dimension that is important to homebuyers in order to make the target home seem like a good buy in comparison.<sup>60</sup> Similarly, manufacturers often offer extremely

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56. The forty-two judges included forty-one U.S. magistrate judges and one U.S. district judge.

57. Fisher's exact test,  $p = .75$ .

58. Kelman et al., *supra* note 38.

59. Guthrie, *supra* note 46, at 617–19.

60. See ROBERT B. CIALDINI, *INFLUENCE: SCIENCE AND PRACTICE* 14 (4th ed. 2001).

high-end (and high-priced) versions of their products that they do not expect to sell in order to increase sales of more moderately priced products.<sup>61</sup> If such distractions can affect homebuyers and consumers when they are making serious decisions, then judges might be just as vulnerable.

The contrast effect might also explain why lawyers sometimes deliberately include weak arguments in their briefs to accompany potentially winning arguments. The weak arguments might make the tenable ones seem stronger by contrast. The effectiveness of this strategy is dubious, however, because including weak arguments might also undermine the lawyer's credibility. In any event, both consumer studies and our own research demonstrate that judges can be susceptible to the contrast effect. The lesson these studies teach is that adding seemingly irrelevant information can alter the focus of judges' attention, so the decision about whether to do it should be carefully considered.

### III. IMAGING THE NUMERATOR

We have argued elsewhere that judges, like most adults, use two distinct cognitive systems to make judgments: an intuitive system founded largely on affective processes (System 1) and a deliberative system founded largely on deductive processes (System 2).<sup>62</sup> The intuitive system is surprisingly accurate,<sup>63</sup> but it can lead to predictable errors in judgment when relied upon in the wrong circumstances. Because the intuitive system is faster than the deductive system, good judgment often requires a person to suppress an intuitive response and substitute a more deliberative response.<sup>64</sup> We have found that judges sometimes suppress misleading intuitive responses, but that they do not do so consistently.<sup>65</sup>

When asked to make judgments based on probabilistic information, people often rely on intuitive processes and gut feelings rather than on their deliberative and deductive faculties. This tendency manifests itself in multiple ways. One common way is through the process of "imaging the numerator," which consists of basing judgment on the size of a numerator in a fraction, while neglecting the denominator.<sup>66</sup>

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61. See Simonson & Tversky, *supra* note 35, at 293–94.

62. Guthrie et al., *Blinking on the Bench*, *supra* note 9, at 6–9.

63. See MALCOLM GLADWELL, *BLINK: THE POWER OF THINKING WITHOUT THINKING* 12–13 (2005).

64. See DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* 28 (2011) (describing deliberative reasoning as an effortful attempt to overcome mistakes that snap judgments can produce).

65. Guthrie et al., *Blinking on the Bench*, *supra* note 9.

66. See Paul Slovic et al., *The Affect Heuristic*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* 397, 413 (Thomas Gilovich et al. eds., 2002) ("We can characterize Epstein's subjects as following a mental strategy of 'imaging the numerator' . . ."). Others have

The so-called jellybean study by Epstein and Kirkpatrick provides a notable example of imaging the numerator.<sup>67</sup> In this study, the researchers told subjects that they would receive a prize if they drew a red jellybean from one of two jars filled with red and white jellybeans. One jar contained one red and nine white jellybeans, while the other contained ten red and ninety white jellybeans. Even though the probability of drawing a red jelly bean from each jar was identical, subjects preferred to draw from the jar containing ten red jellybeans. The researchers argued that the subjects' intuitive systems reacted to the impression that the jar containing ten red jellybeans offered more opportunities to win, thereby ignoring the fact that this jar also provided a proportionate number of chances to lose. The subjects' self-reports confirmed the researchers' hypothesis, as subjects claimed that they relied on their feelings rather than on the odds. One subject explained: "I picked the ones with more red jelly beans because it looked like there were more ways to get a winner, even though I knew there were also more whites, and that the percents were against me."<sup>68</sup> So powerful was this intuition that subjects even preferred the larger bowl when it contained less than ten red jellybeans.<sup>69</sup>

Research by John Monahan and Eric Silver suggests that the phenomenon of imaging the numerator also affects judges.<sup>70</sup> They gave judges descriptions of hypothetical individuals suffering from mental illness and asked them whether they would commit the individuals involuntarily to an institution. They described each individual's condition and diagnosis and asked judges to identify how great the risk of violence would have to be before they would commit the individual. The judges were asked to select one of five levels of risk: 1 percent, 8 percent, 26 percent, 56 percent, or 76 percent. When the researchers presented the risk of violence in a probabilistic format, the modal threshold for commitment was 26

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termed this phenomenon "denominator neglect." See, e.g., Rocio Garcia-Retamero et al., *Do Icon Arrays Help Reduce Denominator Neglect?*, 30 MED. DECISION MAKING 672, 680 (2010) (explaining that people "often pay too much attention to numerators and insufficient attention to denominators").

67. Lee A. Kirkpatrick & Seymour Epstein, *Cognitive-Experiential Self-Theory and Subjective Probability: Further Evidence for Two Conceptual Systems*, 63 J. PERSONALITY & SOC. PSYCHOL. 534, 540-42 (1992).
68. Veronika Denes-Raj & Seymour Epstein, *Conflict Between Intuitive and Rational Processing: When People Behave Against Their Better Judgment*, 66 J. PERSONALITY & SOC. PSYCHOL. 819, 823 (1994).
69. *Id.* at 822 ("[A] majority (61%) preferred the large bowl that offered a 9% probability of winning over the small bowl, with its constant offering of a 10% chance of winning. A substantial number of subjects (23%) selected the large over the small bowl when it offered only half the chance (5% vs. 10%) of winning.")
70. John Monahan & Eric Silver, *Judicial Decision Thresholds for Violence Risk Management*, 2 INT'L J. FORENSIC MENTAL HEALTH 1, 4 (2003).

percent. When the researchers presented the risks in a frequentist format (that is, one in one hundred, eight in one hundred, twenty-six in one hundred, fifty-six in one hundred, or seventy-six in one hundred), however, the modal threshold dropped to eight in one hundred. Presenting the risk of violence in a frequentist format encouraged the judges to think of the person as violent. The authors liken this effect to imaging the numerator. The risk of violence seems greater when it is described as eight in one hundred times rather than as 8 percent of the time.

Although the differences observed in the Monahan and Silver study were not statistically significant,<sup>71</sup> the result is comparable to the differences observed by forensic experts who participated in similar studies.<sup>72</sup> In one such study, for example, researchers asked clinical psychologists to indicate whether they would be willing to recommend committing a potentially violent individual.<sup>73</sup> Among the experts who were told that 8 percent of people with this individual's condition commit a violent act, 39 percent of them stated that they would recommend committing him.<sup>74</sup> Among the experts who learned that eight out of one hundred people with this individual's condition commit a violent act, 61 percent stated that they would commit him.<sup>75</sup>

In similar work, Jay Koehler has demonstrated that presenting the same information in frequentist format instead of probabilistic format can affect ordinary adults acting as jurors in a criminal case.<sup>76</sup> Koehler gave mock jurors a one-page description of a murder case in which a prosecutor presented testimony involving a forensic technique known as polymerase chain reaction (PCR) matching—a simple form of DNA matching.<sup>77</sup> Koehler informed the mock jurors that this PCR technique had revealed that blood from the crime scene matched that of the defendant. Koehler further apprised them of the likelihood that an innocent person randomly drawn from the community at large would also match the crime scene blood. He presented this probability either as 0.1 percent (probabilistic format) or

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71. *Id.* Although the authors do not report test statistics, they do report the raw data, which enabled us to conduct an order logistic regression, which confirmed that the trend was not significant ( $p = .38$ ). The authors only had twenty-six judges available for the study, which was unlikely to detect the difference that researchers have found between presentations in probabilistic format and frequentist format in other contexts.

72. See Paul Slovic et al., *Violence Risk Assessment and Risk Communication: The Effects of Using Actual Cases, Providing Instruction, and Employing Probability Versus Frequency Formats*, 24 *LAW & HUM. BEHAV.* 271 (2000).

73. *Id.*

74. *Id.*

75. *Id.*

76. Jonathan J. Koehler, *The Psychology of Numbers in the Courtroom: How to Make DNA-Match Statistics Seem Impressive or Insufficient*, 74 *S. CAL. L. REV.* 1275, 1302–03 (2001).

77. *Id.* at 1287 n.36. The text of Koehler's scenario is included as Appendix B.

as 1 in 1,000 (frequentist format).<sup>78</sup> Koehler found that subjects who saw the statistic presented in probabilistic format were more likely to conclude that the blood at the crime scene had come from the defendant than those who saw the statistic in frequentist format. Those exposed to the statistic in probabilistic format, however, did not also express a greater willingness to convict the defendant. Koehler's results confirm that the frequentist format makes it easier to imagine that many individuals would match the blood type. In contrast, the probabilistic format makes it easier to commit the "prosecutor's fallacy,"<sup>79</sup> in which the decisionmaker mistakenly assumes that 0.1 percent refers to the probability that the defendant is innocent. In other words, people deploying their deductive faculties to evaluate information will see information presented in these two formats as identical, while those relying on their intuitive faculties are more likely to interpret the frequentist presentation as suggesting innocence and the probabilistic presentation as suggesting guilt.<sup>80</sup>

These studies produce clear recommendations for lawyers: Prosecutors should generally present statistics in a probabilistic format, and criminal defense attorneys should generally present statistics in a frequentist format. Each format highlights a slightly different aspect of the same statistical evidence. The probabilistic format induces people to believe that the evidence strongly supports guilt. People exposed to the probabilistic format must thus decide how firmly they believe in forensic testimony. Conversely, the frequentist format invites people to imagine a large number of potentially innocent people who might also match the evidence. People exposed to statistics in the frequentist format must then consider, in light of other facts surrounding the case, whether the defendant is one of the many innocents or the perpetrator. In short, by thoughtfully selecting the format in which they present evidence, litigators may effectively be able to shift the object of decisionmakers' analyses and thereby alter case outcomes.

To assess whether this same effect would be observed in trial judges, we presented Koehler's materials to three groups of trial judges at various state edu-

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78. *Id.* at 1288. Koehler also varied the specificity of the population of potential innocents. He stated this either in a general way (e.g., "the probability that the suspect would match the blood sample if he were not the source is 0.1%") or by identifying a specific population (e.g., "0.1% of people in Houston would also match the blood drops"). In our study, reported below, we also varied this parameter, but we found it had little effect on the judges. Hence, we do not discuss it in detail.

79. See William C. Thompson & Edward L. Schumann, *Interpretation of Statistical Evidence in Criminal Trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy*, 11 LAW & HUM. BEHAV. 167, 170-71 (1987).

80. See Leila Schneps & Coralie Colmez, *Justice Flunks Math*, N.Y. TIMES, Mar. 26, 2013, <http://www.nytimes.com/2013/03/27/opinion/when-judges-cant-do-math-justice-suffers.html> ("Miscalculation by judges and lawyers of probabilities, from the odds of DNA matches to the chance of accidental death, have sent innocent people to jail, and, perhaps, let murderers walk free.").

cational conferences, including 68 judges from an urban Eastern jurisdiction,<sup>81</sup> 120 judges from Ohio, and 88 California judges.<sup>82</sup> We presented each of the judges with one of four versions of Koehler's scenario. Two versions presented the likelihood of matching in probabilistic (0.1 percent) format, and the other two presented it in frequentist (1 in 1000) format. This variation was crossed with the degree of specificity of the sample from which the innocent matches might be drawn (matching in general or matching people from the jurisdiction). Following Koehler, we asked the judges three questions about the fact pattern:

- (1) Based on this evidence, what is the probability that the defendant is the source of the recovered DNA trace? \_\_\_ percent
- (2) Based on this evidence, what is the probability that the defendant is guilty of the murder of Mr. Oden? \_\_\_ percent
- (3) Based on this evidence, how would you find the defendant (assuming a bench trial)? (Guilty or Not Guilty)

As to the first two questions, the judges' results mirrored Koehler's findings. Judges presented with the frequentist format indicated, on average, that the likelihood that the defendant was the perpetrator was 48 percent, whereas judges presented with the probabilistic format indicated, on average, that the likelihood of a match was 72 percent.<sup>83</sup> This difference was statistically significant.<sup>84</sup> Judges' responses regarding the probability that the defendant had committed the crime echoed this result. Judges in the frequentist condition assigned an average probability of guilt of 51 percent, as opposed to 69 percent of those in the probabilistic condition. This difference was also statistically significant.<sup>85</sup>

These assessments, however, did not affect the judges' verdicts. Among the judges who saw the frequentist presentation, 46 percent indicated that they would find the defendant guilty as opposed to 53 percent of the judges who saw the prob-

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81. These judges preferred not to have their jurisdiction identified. Three judges declined to allow us to use their results for any further discussion, and the results from these judges have been omitted from all analysis.

82. At each of these conferences, we presented at a plenary session.

83. Overall, 144 judges reviewed the frequentist presentation and 132 reviewed the probability presentation. Among judges reviewing the frequentist presentation twenty-four, thirty-four, and three declined to answer the questions concerning the probability that the defendant was the source, the probability that the defendant was guilty, and the verdict. Among judges reviewing the probability presentation twenty-nine, forty, and ten declined to answer these questions, respectively.

84.  $F(1,219) = 17.39, p < .001$ . Specificity (general versus specific location) and the interaction between specificity and format were not significant ( $F = 0.67$  and  $F = 0.51$ , respectively).

85.  $F(1,198) = 10.02, p = .002$ . Specificity (general versus specific city) and the interaction between specificity and format were not significant ( $F = 0.89$  and  $F = 0.38$ , respectively).

abilistic presentation. This difference is not significant.<sup>86</sup> This disparity between the judges' willingness to convict and their assessment of the probability of the defendant's guilt also parallels Koehler's finding with lay adults.<sup>87</sup>

The results suggest an interesting dichotomy. Judges (and lay adults) were influenced by the format in which statistical evidence was presented. They assessed the facts differently and reported that they were more persuaded by the evidence when it was presented in the probabilistic format. Nonetheless, the format did not affect the judges' willingness to convict the defendant. This result suggests that when judges are asked to render a verdict on guilt rather than to merely assess probability of guilt, they shift from reliance on intuition to a more deliberative cognitive process. Rendering a verdict likely encourages a more careful analysis of the evidence, because the risk of a wrongful conviction reduces the judge's confidence in police, prosecutors, and the evidence in general.<sup>88</sup> For judges, determining the verdict presents a different question than does assessing the probability of a blood match.

Notably, the fact that we—and Koehler—observed a small trend towards greater conviction in the probabilistic format suggests that we might not have had enough statistical power to detect an effect on a binary outcome, like guilt. Koehler, in fact, suggests as much and cites a similar study in which a significant effect was observed on guilt.<sup>89</sup> Nevertheless, the influence of the format on verdicts appears to be smaller than the influence of the format on probability assessments. Judges and jurors have to be confident of guilt to convict and likely spend more cognitive effort assessing guilt than making probability estimates. This effort tends to produce more reliable judgments.

#### IV. SUPPRESSED CONFESSIONS: POLICING THE POLICE

Our final study examines a situation in which judges are under cognitive pressure to rely on an untoward influence—that of suppressed evidence. In bench trials, motions, and sentencings, judges can sometimes find themselves in the awkward position of having to determine what evidence to admit and then having to attempt to disregard the evidence that they have excluded. Juries have a

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86. Fisher's exact test,  $p = .61$ .

87. Koehler found that 32 percent of those who read the frequency format convicted, but 36 percent of those who read the probability format convicted. Koehler, *supra* note 76, at 1289.

88. See Charles Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357, 1378 (1985) (“[T]he correlation between probability and acceptability is not exact.”).

89. Koehler, *supra* note 76, at 1289 n.40.

luxury in this regard, in that they are commonly (although certainly not always) shielded from any knowledge of the excluded evidence.

In a previous paper, we demonstrated that judges are often influenced by evidence even after they have ruled it inadmissible.<sup>90</sup> We also identified two circumstances in which judges seemed able to disregard inadmissible evidence. First, judges ignored the outcome of a search when making probable cause assessments,<sup>91</sup> and, second, judges seemed unaffected by a reliable but illegally obtained confession.<sup>92</sup> We follow up on this latter finding here.

In our previous experiment, we asked judges to decide whether they would find a criminal defendant guilty or innocent in a bench trial. We provided all of the judges with a scenario containing rather weak evidence as to the guilt of a defendant charged with robbing a convenience store. We informed half of the judges that the defendant had provided a reliable confession to the crime but that the confession was obtained two hours after the defendant had asked for a lawyer—a request that the police had ignored. When we asked these judges to rule on the admissibility of this confession, almost all of the judges ruled the confession inadmissible.<sup>93</sup> Surprisingly, they also appeared to ignore it when deciding whether to convict. Judges who learned of the confession and suppressed it were no more likely to convict the defendant than the other half of the judges who had never heard the confession.<sup>94</sup>

We wondered how judges managed to accomplish this cognitively challenging task. Anecdotal comments from the judges who participated in the study provided a few clues as to what might have accounted for their apparent ability to disregard the relevant but inadmissible confession. Judges noted that the crime was “only a robbery,” no one was hurt, and that not much cash was stolen. Thus, the cost of suppressing the evidence—a lost conviction for a relatively minor crime—was lower than it would have been for a more serious crime. The judges also expressed annoyance at the police officers’ blatant disregard of constitutional rights.

Such comments suggest that the judges did not truly ignore the inadmissible confession but rather discounted its importance under the circumstances by weighing the cost of suppression against the degree of police misconduct. If

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90. Wistrich et al., *supra* note 9, at 1286–1324.

91. *Id.* at 1313–18. We explored this result in exhaustive detail in Rachlinski et al., *Probable Cause*, *supra* note 9.

92. Wistrich et al., *supra* note 9, at 1318–22.

93. *Id.* at 1321 n.278.

94. *Id.* at 1321. Although 20.7 percent of the judges convicted when exposed to the inadmissible confession and only 17.7 percent convicted in the control condition, that difference was not statistically significant. *Id.*

that inference is correct, then both the gravity of the crime and the severity of police misconduct could influence conviction rates. To test this theory, we used a similar fact pattern, but we altered it by varying both the gravity of the crime and the severity of the police misconduct. The new hypothetical case contained a 2x3 design in which we crossed the gravity of the crime (armed robbery or murder) and the severity of the police misconduct (none, mild or severe). We tested whether either or both factors would influence conviction rates.

We created two crime fact patterns modeled after our earlier study. One involved a bank robbery, while the other involved a bank robbery that included a murder. All versions of the problem, labeled "Evaluation of a Robbery Trial," included the following facts (additional facts present only in the robbery-turned-murder version are noted in brackets):

Mr. Simson is on trial for bank robbery under 18 U.S.C. § 2113 [MURDER: and a related murder]. Mr. Simson has waived his right to a jury trial. You are thus presiding in a bench trial. The following summarizes the evidence presented at trial:

In the early morning, an armed assailant wearing jeans, a white t-shirt, a ski mask, and black gloves entered a small branch of First Federal Bank (a federally insured bank), ordered everyone onto the ground, and demanded that a teller put money in a plastic shopping bag. The teller complied, quickly emptying \$520 that she had just received from a customer into the bag. As she reached for more money, the perpetrator ran off. The robbery was captured on a surveillance camera videotape.

[MURDER: On his way out of the bank, the perpetrator stumbled into a young woman pushing a stroller with her infant son. Startled, the perpetrator fired at the woman twice, killing her instantly. The child was unharmed.]

When police arrived, the teller reported that once outside the bank, the perpetrator pulled off his ski mask, discarding both it and the gun as he climbed quickly into a white Ford Taurus, and sped off. Police retrieved the gun and mask; neither had usable fingerprints. The gun was unloaded. The gun had been reported stolen several years earlier by its original owner, who is now deceased.

Several police officers then began a search of the neighborhood for a white Ford Taurus. Two hours after the crime, they found one, parked 10 blocks from the crime scene. The Department of Motor Vehicle records identified the owner as the defendant. The police knocked on the door to his apartment. The defendant matched the height, weight, and race of the perpetrator in the surveillance videotape, although he

was wearing different clothing. The police then insisted that the defendant accompany them to the stationhouse to answer questions, which he did.

Upon arrival, the police led him to a room, locked the door, read him his *Miranda* rights, and began interrogating him. The defendant reported that he had been home alone all morning. The police allowed the teller to listen in from the next room. The teller reportedly said “that sounds like the guy.” The police then placed the defendant under arrest. They obtained a search warrant and searched his apartment. They found shopping bags similar to the one used by the perpetrator of the crime, a pair of black gloves, and clothing matching that of the perpetrator (white t-shirt and jeans) in the washing machine. The defendant also had nearly six hundred dollars in cash in his apartment. The police did not find firearms or ammunition of any kind.

In the two versions not containing a confession, the materials ended by noting: “The police continued questioning the defendant, but he requested a lawyer and the interrogation ended.” Then the materials asked: “Based solely on the evidence admitted at trial, would you convict the defendant?”

In the two versions involving mild police misconduct, the story instead continued as follows:

The police continued questioning the defendant. Even though the defendant clearly requested a lawyer, twice, the police refused to call one and continued the interrogation. Two hours later, the defendant confessed and agreed to write out a description of the crime. His written description matched the events perfectly, including the fact that he discarded the ski mask and gun outside the store (which the police had not told him). The entire interrogation was recorded with both video and audio.

In the two versions involving severe police misconduct, the story continued in a different manner:

The police continued to interrogate the defendant. During the entire interrogation, they had denied the defendant access to the restroom, and he ultimately soiled his clothing. One officer had threatened the defendant and “pushed him around.” After nine hours of this treatment, the defendant confessed and agreed to write out a description of the crime. His written description matched the events perfectly, including the fact that he discarded the ski mask and gun outside the store (which the police had not told him). The entire interrogation was recorded with both video and audio.

Finally, in the four versions in which the defendant confessed, the materials went on to state:

The defendant’s attorney has moved to suppress the confession, arguing that the interrogation violated the defendant’s rights under *Miranda* by continuing after the defendant had requested an attorney. Would you grant the motion and suppress the evidence?

After obtaining the ruling, the materials then asked: “Based solely on the evidence admitted at trial, would you convict the defendant?”

We presented this scenario at multiple judicial education conferences in order to obtain enough data to fill out all six conditions; in all, 81 U.S. district judges, 44 U.S. magistrate judges, 101 Florida state trial judges, and 88 California state trial court judges responded to this scenario—for a total of 314 judges.

Excluding the small group of judges who declined to suppress the evidence,<sup>95</sup> Table 2 below reports the conviction rates by condition.<sup>96</sup>

TABLE 2. Percent Convicting by Condition

	No Confession	Mild Police Misconduct	Severe Police Misconduct	Total
Robbery	29.6 (13/44)	43.1 (22/51)	28.3 (15/53)	33.8 (50/148)
Murder	24.0 (12/50)	36.0 (18/50)	44.0 (22/50)	34.7 (52/150)
Total	26.6 (25/94)	39.6 (40/101)	35.9 (37/103)	34.2 (102/298)

Unlike our previous study, the confession affected the judges’ verdicts, although this effect varied with the gravity of the crime and the severity of the police misconduct. In the absence of a confession, the gravity of the crime did not affect the conviction rate significantly; roughly one in four judges convicted in both the murder and robbery scenarios.<sup>97</sup> When the police engaged in a minor

95. Seven judges in total admitted the confession. These consisted of one district judge who convicted in the murder, severe misconduct condition; one district judge who acquitted in the robbery, severe misconduct condition; one magistrate judge who convicted in the robbery, mild misconduct condition; one Florida judge who acquitted in the murder, mild misconduct condition; one Florida judge who convicted in the murder, mild misconduct condition; one Florida judge who convicted in the robbery, mild misconduct condition; and one California judge who convicted in the robbery, mild misconduct condition.

96. Nine judges gave no verdict, including six Florida judges (one robbery, no confession condition; one robbery, mild misconduct condition; one robbery, severe misconduct condition; one murder, mild misconduct condition; two murder, severe misconduct condition) and three California judges (one robbery, mild misconduct condition; one murder, mild misconduct condition; one murder, severe misconduct condition).

97. Fisher’s exact test,  $p = .642$ .

violation of the defendant's rights, the judges were influenced by the confession; even though they suppressed the confession, they were more likely to convict the defendant.<sup>98</sup> Interestingly, the gravity of the crime did not affect the conviction rate in the mild misconduct scenarios.<sup>99</sup> When the police misconduct was severe, however, the conviction rate dropped slightly for the robbery (albeit not significantly),<sup>100</sup> and rose slightly for the murder.<sup>101</sup>

Analyzing the results using logistic regression revealed that, overall, the gravity of the crime had no significant effect,<sup>102</sup> the presence of a confession had a marginally significant effect,<sup>103</sup> the severe police misconduct produced a slightly lower conviction rate than the mild police misconduct,<sup>104</sup> and the crime by confession interaction was not significant.<sup>105</sup> Notably, however, the interaction between the crime and the severity of the police misconduct was significant.<sup>106</sup> In effect, the presence of a confession and the severity of the police misconduct affected the judges differently for each crime. For the robbery, the confession after mild misconduct increased the conviction rate, but the conviction rate returned to the baseline rate when the police misconduct was severe. For the murder, the confession after mild misconduct increased the conviction rate, and the conviction rate remained higher even when the police misconduct was severe.

These results show that judges are not, in fact, able to ignore a confession. Rather, both the confession—and the degree of police misconduct that produced it—factor into the judge's ultimate decision. More severe police misconduct reduced the judges' willingness to convict—but only for a less serious crime. When the defendant had committed murder, the judges were less willing to punish the same police misconduct with lower conviction rates—rather, the judges who had heard confessions, however obtained, were consistently more willing to convict. It is noteworthy that, even while making this complex judgment, the judges followed the law exceptionally well—almost all of the judges recognized that the confessions were clearly illegally obtained and suppressed them. But the judges also took two extralegal steps. They convicted the defendant more often when they learned of (and suppressed) the confession, and they punished severe police mis-

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98. Collapsing across both crimes, the conviction rate in the confession condition in which police misconduct was mild (39.6 percent) was marginally significantly higher than the conviction rate when there was no confession (26.6 percent). Fisher's exact test,  $p = .07$ .

99. Fisher's exact test,  $p = .54$ .

100. Fisher's exact test,  $p = .15$ .

101. Fisher's exact test,  $p = .54$ .

102.  $z = .61$ ,  $p = .54$ .

103.  $z = 1.68$ ,  $p = .09$ .

104.  $z = 1.98$ ,  $p = .05$ .

105.  $z = .20$ ,  $p = .85$ .

106.  $z = 2.03$ ,  $p = .04$ .

conduct not only by suppressing the conviction (which the law obliges them to do) but also by reducing their willingness to convict the defendant (when the crime was only a robbery).

The object of judgment in this hypothetical case was a combination of the underlying facts, the additional confession, the underlying crime, and the severity of police misconduct. If the judges had truly been ignoring the confession, only the underlying facts would have affected their judgment.

### CONCLUSION

Cases are often complicated.<sup>107</sup> Judges, who suffer from the same cognitive limitations as the rest of us, cannot possibly give each aspect of a complicated case the same degree of consideration—especially not while under pressure to render a quick decision. Inevitably, some aspects of a case influence a judge more than others. Therefore, the quality of justice may depend on the object of the judge's attention.

In this Article, we have shown various ways in which shifting the locus of a judge's attention can alter the judge's analytical process and ultimate judgment. Collectively, our studies show that presenting judges with additional information or altering the way in which information is presented can affect judges' decisions. For example, making the burden that incarceration poses on the state more salient to a judge can inject new, utilitarian considerations into the judge's decisionmaking process and change sentencing outcomes. Similarly, the format in which statistical information is presented can shift a judge's attention from the likelihood of guilt to the likelihood of innocence—and vice versa. In this sense, judges are akin to officials in a basketball game. The fouls an official calls during a game depends on the particular players that the official happens to be watching at a critical moment. If an official keeps his eye on the ball-handler on the perimeter, he might miss a foul under the basket; if he focuses on the rebounders under the basket, he might miss a travel or double dribble by the ball-handler on the perimeter. Likewise, a judge's inferences, evidentiary determinations, rulings on motions, and criminal sentences might turn on which aspects of the case capture the judge's attention at the time she renders her decision.

This has obvious implications for litigators and their clients. Because of case complexity, heavy caseloads, and cognitive constraints, judges tend to focus their

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107. LOUIS D. BRANDEIS, *LOUIS D. BRANDEIS'S MIT LECTURES ON LAW (1892–1894)*, at 247–48 (Robert F. Cochran, Jr. ed., 2012) (“[Q]uestions instead of being simple, so that it is clear who is in the right, are extremely complicated; it is often impossible to tell who is either legally or morally right, until the case is tried out in court, and the decision rendered by the proper tribunal.”).

attention on some aspects of a case and to neglect others. A good lawyer will attempt to steer a judge's attention in a direction that benefits that lawyer's case. For example, defense counsel might mention the costs of incarceration or highlight shady police conduct. Defense attorneys might also seek to present data in a frequentist format to highlight the likelihood of innocence, while prosecutors can increase the likelihood of a conviction by presenting statistical data in a probabilistic format. Further, litigators should be mindful that the presence of less credible experts or percipient witnesses can influence judges' assessments of other expert or percipient witnesses.

The adversarial system places judges in a challenging position. It makes them dependent upon litigants for information, so much so that judges have been likened to oysters who can absorb only what happens to be provided to them.<sup>108</sup> Even a managerial judge<sup>109</sup> cannot entirely control what is presented to him or her, or the format in which it is presented. This may leave judges vulnerable to distraction, misdirection, and manipulation. Like the magician's mark, their attention may be shifted to the wrong place at the wrong time, rendering them susceptible to sophistry. The rules of evidence and procedure are designed to mitigate this danger, but they have achieved limited success. They fail to regulate many situations in which the decisionmaker is vulnerable to attention-shifting mechanisms,<sup>110</sup> and even regulated areas—such as questions of the admissibility of evidence—they imperfectly safeguard the decisionmaker's impartiality.<sup>111</sup> Collectively, our experiments suggest that, although judges are vulnerable to misdirection techniques, they sometimes do succeed in keeping their eyes on the ball.

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108. Calvert Magruder, *Mr. Justice Brandeis*, 55 HARV. L. REV. 193, 194 (1941) ("The position of a judge has been likened to that of an oyster—anchored in one place, unable to take the initiative, unable to go out after things, restricted to working on and digesting what the fortuitous eddies and currents of litigation may wash his way.").

109. See generally Judith Resnik, *Managerial Judges*, 96 HARV. L. REV. 374 (1982).

110. For example, they do not prescribe the format in which statistical evidence must be presented (or require that it be presented in multiple formats), tightly restrict what counsel can present in closing argument, and so on.

111. For example, they do not prohibit attorneys from proffering inadmissible evidence or bar judges from presiding over settlement conferences in their own cases.

**APPENDIX A: TRUTH IN SENTENCING SCENARIO****State v. Campbell [Rape]**

Imagine you are presiding over a rape case.

Hector Campbell, an unemployed drummer, was arrested at a party for allegedly raping his ex-girlfriend at knifepoint. Hector was charged with rape. The evidence at trial, which included testimony from the girlfriend and two other witnesses, showed convincingly that he did commit the rape. Hector is 24-years-old and has a high school diploma and a spotty employment record. He has one prior conviction for assault and battery.

In your jurisdiction, rape involving an aggravating factor like the use of a deadly weapon carries a maximum prison sentence of 25 years. [You have learned from your jurisdiction's sentencing advisory commission that Hector's incarceration will cost the state \$387,500/\$775,000 if he were to serve the maximum sentence (\$15,500/\$31,000 per year).]

Based solely on these facts, what sentence will you impose on Hector?

**State v. Campbell [Drug possession]**

Imagine you are presiding over a drug possession case.

Hector Campbell, an unemployed drummer, was arrested at a party for allegedly possessing 150 grams of methamphetamine. Hector was charged with drug possession. The evidence at trial which included testimony from an undercover police officer and two other witnesses, showed convincingly that he had methamphetamine in his possession. Hector is 24-years-old and has a high school diploma and a spotty employment record. He has one prior conviction for possession of marijuana.

In your jurisdiction, methamphetamine possession without intent to sell carries a maximum prison sentence of 8 years. [You have learned from your jurisdiction's sentencing advisory commission that Hector's incarceration will cost the state \$124,000/\$248,000 if he were to serve the maximum sentence (\$15,500/\$31,000 per year).]

Based solely on these facts, what sentence will you impose on Hector?

### APPENDIX B: FORENSIC EVIDENCE PROBLEM

Imagine that you are presiding over *People v. Nethers*, a criminal case. In *People v. Nethers*, Steven Nethers was accused of murdering Richard Oden during an attempted robbery of a hardware store owned by Mr. Oden. According to reliable eyewitness accounts, the perpetrator entered Mr. Oden's hardware store at approximately 4:30 p.m. on November 2, 1997 wearing a Halloween-type of mask, and waving a small caliber handgun. The perpetrator approached Mr. Oden (who was behind the cash register) and said, "Open it fast or you're a dead man." According to the eyewitnesses, when the perpetrator turned his head to survey the store, Mr. Oden grabbed a hammer from the counter and smashed the perpetrator on the head with a single blow. The perpetrator fired a single shot into Mr. Oden's chest and fled the store. Mr. Oden died shortly thereafter in a local hospital.

During an investigation of the hardware store crime scene, the police identified and recovered several moist blood drops from the path that was taken by the perpetrator as he fled the store. These drops were subjected to a form of DNA analysis called PCR testing. The PCR tests revealed the blood to be of a type known as "2, 3." Because this blood type was different from Mr. Oden's blood type, police believed that the recovered blood drops came from the bleeding head of the robber. During routine interviews of people who live in the neighborhood, the police identified several potential suspects. All of these individuals agreed to provide blood samples to police for comparison with blood that was recovered from the crime scene. One of the suspects, Mr. Steven Nethers, matched the 2, 3 blood type and was arrested for the murder.

At trial, the prosecution alleged that the blood analysis demonstrated Mr. Nethers was the source of the wet blood drops, and that he was therefore guilty of attempted robbery and murder. A DNA expert testified that his tests could not rule out Mr. Nethers as a possible source of the blood drops. He also testified that the probability that the suspect would match the blood sample if he were not the source is [0.1 percent/ 1 in 1,000]. The defense argued that the blood evidence is irrelevant because there was no direct evidence, such as eyewitness identifications, that linked Mr. Nethers to these crimes.