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NEUROSCIENCE AND SENTENCING

Nancy Gertner*

INTRODUCTION

This symposium comes at a propitious time for me. I am reviewing the sentences I was obliged to give to hundreds of men—mostly African American men—over the course of a seventeen-year federal judicial career.¹ As I have written elsewhere, I believe that 80 percent of the sentences that I imposed were unfair, unjust, and disproportionate.² Everything that I thought was important—that neuroscientists, for example, have found to be salient in affecting behavior—was irrelevant to the analysis I was supposed to conduct. My goal—for which this symposium plays an important part—is to reevaluate those sentences now under a more rational and humane system, this time at least informed by the insights of science. The question is how to do that: How can neuroscience contribute to the enterprise and what are the pitfalls? This Article represents a few of my preliminary conclusions, but my retrospective analysis is not complete.

I approach the issue of neuroscience and sentencing from three vantage points. First, I look at the sentencer's brain. I ask who the sentencing decision maker is and what cognitive and other pressures the sentencer experiences.³ The insights of neuroscience will be a nullity if they are filtered through a system—like the one I labored under—that makes them irrelevant, ignored, and even trivialized. Likewise, science will be irrelevant if decades of a mandatory sentencing system has affected the cognitive lens through which judges today see the sentencing task, as I believe it has. Nearly thirty years of sentencing by a flawed formula—of avoiding the exercise of meaningful discretion; of major changes in the division of labor on

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1. I retired from the U.S. District Court for the District of Massachusetts in September 2011.

2. See, e.g., Nancy Gertner, *Undoing the Damage of Mass Incarceration*, *BOS. GLOBE* (Nov. 4, 2015), <https://www.bostonglobe.com/opinion/2015/11/04/undoing-damage-mass-incarceration/9Ww80SKxQm9EbdHxmZG5sM/story.html> [<https://perma.cc/J6BL-83B3>].

3. The model for dealing with the “sentencer’s brain” was laid out in Judge Morris Hoffman’s superb book, see MORRIS B. HOFFMAN, *THE PUNISHER’S BRAIN: THE EVOLUTION OF JUDGE AND JURY 204–07* (2014), which addressed the evolutionary antecedents of punishment.

sentencing between Congress, prosecutors, and the U.S. Sentencing Commission; and of a relentless focus on retribution and sentencing disparity, rather than rehabilitation or deterrence—has altered the “sentencer’s brain.”⁴ Second, I address the sentencing stage, the context in which neuroscience may play a role, and the rules governing it. Sentencing is the territory of what I have described as “good enough” evidence, where the rules of evidence, including the rules on the admission of expert testimony set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,⁵ do not apply and where there are few constitutional protections guaranteeing the defense’s access to information. This is a setting that poses considerable promise and dangers for science: the promise of using neuroscience to meaningfully individualize sentences on the one hand, and the risks of manipulation in the introduction of junk science on the other. Third, I address—at a very preliminary level—what kind of substantive content neuroscience can bring to sentencing decisions. Because the science is changing rapidly, this section is suggestive at best. Its implications for sentencing could well fill a tome, not an article.

I. THE SENTENCER’S BRAIN

For the past three decades, the sentencer’s brain in the federal system and many state systems has been focused on only one of the traditional purposes of sentencing⁶: retribution. In addition, it has focused on one sentencing problem: the avoidance of unwarranted sentencing disparity between judges. The resulting sentencing regime was rigid, formulaic, and severe. Rehabilitation was discredited as a purpose of sentencing in the 1980s because some social scientists believed that it did not work.⁷ In addition, disparate sentencing practices—particularly racial inequities—seemed inevitable in a system that focused almost exclusively on the individual and had so little empirical evidence, training, peer review—or any review—to

4. See generally Nancy Gertner, *A Short History of American Sentencing: Too Little Law, Too Much Law, or Just Right*, 100 J. CRIM. L. & CRIMINOLOGY 691 (2010) [hereinafter Gertner, *A Short History of American Sentencing*]; Nancy Gertner, *From Omnipotence to Impotence: American Judges and Sentencing*, 4 OHIO ST. J. CRIM. L. 523 (2007) [hereinafter Gertner, *From Omnipotence to Impotence*]. I focus on federal sentencing first because it is the system with which I am most familiar but also because of the significance of federal sentencing practices on state systems. Although state courts account for the vast majority of criminal prosecutions, federal law had an outsized impact on their work.

5. 509 U.S. 579 (1993).

6. The traditional purposes of sentencing are retribution, incapacitation, deterrence, and rehabilitation. See, e.g., Michael M. O’Hear, *The Original Intent of Uniformity in Federal Sentencing*, 74 U. CIN. L. REV. 749, 753 (2006).

7. See Robert Martinson, *What Works? Questions and Answers About Prison Reform*, 35 PUB. INT. 22 (1974). Robert Martinson later recanted his 1974 work. See Robert Martinson, *New Findings, New Views: A Note of Caution Regarding Sentencing Reform*, 7 HOFSTRA L. REV. 243, 252 (1979) (noting that “new evidence” led him to reject his prior conclusion). Indeed, rehabilitation was challenged by progressive groups like the American Friends Service Committee: “The ideal to which reformers have been urging us is theoretically faulty, systematically discriminatory in administration and inconsistent with some of our most basic concepts of justice. The 200-year-old experiment has failed.” AM. FRIENDS SERV. COMM., STRUGGLE FOR JUSTICE: A REPORT ON CRIME AND PUNISHMENT IN AMERICA 12 (1971).

support it.⁸ But in the past decade, concerns about mass incarceration, the continued racial imbalances, and high cost of imprisonment after the 2008 Great Recession, have led to a growing emphasis on what some scholars have called the “new rehabilitation,”⁹ this time apparently grounded more in science—especially neuroscience—and with apparently more modest aims.

It is worth reviewing rehabilitation’s history and failures, if only as a cautionary tale, for what it may forecast about the new rehabilitation’s use of neuroscience in sentencing. And it is likewise worth reviewing the three-decades-long sentencing regime that existed between the old rehabilitation and the new to evaluate the changes, if any, it has made in the sentencer’s brain.

A. *The Ideal of Rehabilitation*

From the turn of the century through the 1980s, the predominant view was that crime was a “moral disease.”¹⁰ Sentencing mimicked a medical model in which judges were charged with tailoring the punishment to the individual—in effect, coming up with a “cure.”¹¹ The problem was that judges did not know how to exercise their considerable discretion. Sentencing was not taught in law school. To the extent that there was any debate about the efficacy of programs or approaches, it was on the pages of scholarly journals, not in judicial courses.¹² As I have noted, “[i]t was as if judges were functioning as diagnosticians without authoritative texts, surgeons without *Gray’s Anatomy*.”¹³

Until the enactment of the Federal Sentencing Guidelines (“the Guidelines”) in 1987, appellate review of sentences was extremely limited. If judges were not asked to give reasons for their sentences, they did not do so. Few bothered to write sentencing opinions. Nor was there peer review, as there would be in a medical setting.¹⁴

8. I have discussed this at length in several articles. See generally Gertner, *A Short History of American Sentencing*, *supra* note 4; Gertner, *From Omnipotence to Impotence*, *supra* note 4.

9. See Mark R. Fondacaro et al., *The Rebirth of Rehabilitation in Juvenile and Criminal Justice: New Wine in New Bottles*, 41 OHIO N.U. L. REV. 697, 698 (2015); Meghan J. Ryan, *Science and the New Rehabilitation*, 3 VA. J. CRIM. L. 261, 289 (2015).

10. See Elizabeth T. Lear, *Is Conviction Irrelevant?*, 40 UCLA L. REV. 1179, 1186 (1993).

11. See, e.g., *Williams v. New York*, 337 U.S. 241, 248 (1949) (“Today’s philosophy of individualizing sentences makes sharp distinctions for example between first and repeated offenders. . . . Retribution is no longer the dominant objective of the criminal law. Reformation and rehabilitation of offenders [are] important goals of criminal [law].”).

12. Kate Stith and Judge José Cabranes note that “law faculties had long regarded sentencing as a ‘soft’ sub-specialty of criminal law, populated primarily by aficionados of psychiatry, sociology, social work, and other such branches of the ‘social’ sciences.” KATE STITH & JOSÉ A. CABRANES, *FEAR OF JUDGING: SENTENCING GUIDELINES IN THE FEDERAL COURTS* 26 (1998).

13. Gertner, *From Omnipotence to Impotence*, *supra* note 4, at 528.

14. Efforts to guide judicial discretion, as with sentencing councils or sentencing information systems, failed in the years preceding the Sentencing Reform Act. See generally James R. Thompson & Gary L. Starkman, Book Review, 74 COLUM. L. REV. 152, 152 (1974) (reviewing MARVIN E. FRANKEL, *CRIMINAL SENTENCES: LAW WITHOUT ORDER* (1972)).

Unwarranted disparity among judges was inevitable. Judge Marvin Frankel described the disparities as the result of “the unruliness, the absence of rational ordering, the unbridled power of the sentencers to be arbitrary and discriminatory.”¹⁵ There was no common law of sentencing that would have constrained discretion—as there was, for example, in torts or contracts—precisely because there were few formal sentencing opinions, even at the trial level. Constitutional review of sentencing decisions was limited; proportionality challenges based on the Eighth Amendment or due process were rare and, more significantly, rarely successful.¹⁶

Without meaningful studies and evidence, judicial training, or peer review—or indeed, any appellate review—rehabilitation during this period involved more faith than science. It was no surprise that the system resulted in longer sentences and disparity in sentencing between judges—especially racial disparity—and, as a result, a considerable backlash. To avoid that backlash, the new rehabilitation must avoid these pitfalls.

B. Mandatory Guidelines and Mandatory Minimums

By the 1980s, for a variety of reasons that I have addressed elsewhere,¹⁷ retribution and disparity avoidance dominated the federal sentencing regime, giving rise to harsh mandatory minimum sentences and mandatory guidelines.¹⁸ In 1984, Congress passed the Sentencing Reform Act¹⁹ (SRA), creating a new agency, the U.S. Sentencing Commission (“the Sentencing Commission” or “the Commission”), charged with creating and implementing sentencing guidelines. While not immediately apparent from the enabling legislation,²⁰ the Sentencing Commission began to supplant judges as experts in sentencing. That result might have been helpful if the first Commission had been composed of actual experts and if the Guidelines it produced were the product of careful research. Neither was the case.²¹ The Commission was political from the outset, without real sentencing expertise among its members.²² Congress had no problem regularly intervening or

15. FRANKEL, *supra* note 14, at 49. Some scholars have suggested disparity was nowhere near as substantial as the pre-Guidelines scholarship suggested. *See* STITH & CABRANES, *supra* note 12, at 111.

16. *See* Kevin Reitz, *Sentencing Guideline Systems and Sentence Appeals: A Comparison of Federal and State Experiences*, 91 NW. U. L. REV. 1441, 1443 (1997). *See generally* Nancy Gertner, *On Competence, Legitimacy, and Proportionality*, 160 U. PA. L. REV. 1585 (2012).

17. *See* Gertner, *A Short History of American Sentencing*, *supra* note 4.

18. *See* Douglas A. Berman & Stephanos Bibas, *Making Sentencing Sensible*, 4 OHIO ST. J. CRIM. L. 37, 40–41 (2006).

19. Pub. L. No. 98-473, 98 Stat. 1987 (1984).

20. Daniel Freed, *Federal Sentencing in the Wake of Guidelines: Unacceptable Limits on the Discretion of Sentencers*, 101 YALE L.J. 1681, 1744–45 (1992); Gertner, *From Omnipotence to Impotence*, *supra* note 4, at 529–30.

21. *See* FRANKEL, *supra* note 14, at 119–20 (explaining that the Commission called for only “people of stature, competence, devotion, and eloquence,” in particular, “lawyers, judges, penologists, . . . criminologists . . . sociologists, psychologists, business people, artists and . . . former or present prison inmates”); *see also* Gertner, *A Short History of American Sentencing*, *supra* note 4, at 700.

22. STITH & CABRANES, *supra* note 12, at 48.

ignoring it, passing mandatory minimum sentences and directing the Commission to raise particular guidelines. A number of states likewise created sentencing commissions, implementing sentencing guidelines, although none were as detailed and rigid as the Federal Sentencing Guidelines.²³

The Guidelines were, as Professor Kate Stith and Judge José Cabranes described it, “a compilation of administrative diktats”²⁴ that the Commission “promulgated and enforced *ipse dixit*.”²⁵ They were not informed by the purposes of sentencing; there was no legislative history, no findings describing why the Commission made the choices it did. They were unmoored from any evidentiary showing, let alone the insights of science, and they were severe. They comprised “back-of-an-envelope calculations and collective intuitive judgments.”²⁶ While the Commission claimed to base the Guidelines on existing practice, its data were limited and its analysis skewed.²⁷ It took the existing sentencing lengths and increased them, using Congress’s mandatory minimum sentences as the base levels, making sentencing even harsher.

The Commission made other problematic decisions. The Guidelines were complex and numerical. They were keyed to the “objective” facts of the offense and the offender, like the quantity of drugs or the amount of loss on the one hand, and the offender’s criminal record on the other—criteria that would maximize retribution and minimize judicial discretion. They rejected most of the factors that had been salient pre-Guidelines, including concepts of *mens rea*, the traditional basis for moral culpability, and, as I describe below, an area in which neuroscience could well have an impact. Although the statute directed the court to consider the “history and characteristics of the defendant,”²⁸ most factors personal to the offender and salient to neuroscientists were treated as largely irrelevant—drug or alcohol

23. Significantly, the American Law Institute wholly rejected the federal guideline regime in its efforts to propose a model penal code for sentencing. See KEVIN R. REITZ, AM. LAW INST., MODEL PENAL CODE: SENTENCING REPORT 115–25 (2003), <http://www.lhc.ca.gov/studies/185/sentencing/2003ModelPenalCode-ReitzAttachmentAJune06.pdf> (discussing defects in the federal sentencing system) [<https://perma.cc/Q98U-JK2Y>].

24. STITH & CABRANES, *supra* note 12, at 95.

25. *Id.*

26. Michael Tonry, *The Questionable Relevance of Previous Convictions to Punishments for Later Crimes*, in PREVIOUS CONVICTIONS AT SENTENCING: THEORETICAL AND APPLIED PERSPECTIVES 91, 93 (Julian V. Roberts & Andrew von Hirsch eds., 2010).

27. See Gertner, *A Short History of American Sentencing*, *supra* note 4, at 701.

28. 18 U.S.C. § 3553(a) (2012).

dependence, gambling addiction,²⁹ “lack of guidance” as a youth,³⁰ even “mental and emotional conditions.”³¹

To be sure, with the enactment of the Guidelines, there was considerably more judicial training in sentencing than there had ever been prior to their enactment, during the era of the “old rehabilitation.” Significantly, this was training in the application of the Guidelines’ formulas and how to compute the numbers, but there was still no training on the purposes of sentencing, alternatives to incarceration, what works to prevent recidivism or to effect deterrence. The Sentencing Commission would not permit any other agency to provide training on sentencing, even though the Federal Judicial Center, whose mission was to train judges, was well equipped to do so. As neuroscience and psychology advanced, their insights could not make it into federal sentencing in any systematic way. It was, in effect, a closed system, unaffected by science and moved only by the pathological politics of crime, in which the Guidelines were mechanistically and uncritically enforced.

This was especially the case at the appellate level. Judges on the appellate courts, who had never had to address sentencing appeals before the SRA, and may never have sentenced anyone before they became appellate judges, rigorously enforced the Guidelines—the only sentencing framework they knew.³²

The result was more than a change in sentencing practices; it was a change in the lens through which federal judges viewed sentencing. While before the Guidelines and mandatory minimum sentences judges saw sentencing as an aspect of an American judge’s unique competence, and even as essential to judicial independence, those attitudes shifted dramatically in thirty short years.³³ Many federal judges came to believe that they were not competent to sentence at all absent explicit rules externally promulgated by Congress or the Commission and that these entities had more expertise than they had. And sentences that would have been unthinkable decades ago were commonplace. As I noted:

Twenty years of Guideline sentencing has transformed the federal bench. It did so not only for judges who came of age during the Guidelines era. It was also for those who had practiced criminal law, or had been on the bench pre-Sentencing Reform Act. . . . It is a tectonic shift in the way judges see the job of sentencing. Guidelines and mandatory minimum sentences have

29. U.S. SENTENCING GUIDELINES MANUAL § 5H1.4 (U.S. SENTENCING COMM’N 2015) (“Drug or alcohol dependence or abuse ordinarily is not a reason for a downward departure. Substance abuse is highly correlated to an increased propensity to commit crime. . . . In certain cases a downward departure may be appropriate to accomplish a specific treatment purpose.”).

30. *Id.* § 5H1.12 (“Lack of guidance as a youth and similar circumstances indicating a disadvantaged upbringing are not relevant in determining whether a departure is warranted.”).

31. *Id.* § 5H1.3 (“Mental and emotional conditions may be relevant in determining whether a departure is warranted, if such conditions, individually or in combination with other offender characteristics, are present to an unusual degree and distinguish the case from the typical cases covered by the guidelines. . . . In certain cases a downward departure may be appropriate to accomplish a specific treatment purpose.”).

32. See Gertner, *From Omnipotence to Impotence*, *supra* note 4.

33. See *id.* at 524.

simply normalized sentences that would have been obscene years ago. We have come to view imprisonment as the appropriate punishment for all crimes with the only question being *how much*.³⁴

So substantial was the change that even when the Guidelines became advisory after the U.S. Supreme Court's decision in *United States v. Booker*,³⁵ when extraordinary advances in neuroscience offered the possibility of a new kind of rehabilitation, little if anything changed in federal sentencing. And this result is all the more extraordinary because appellate review of non-Guideline sentences post-*Booker* is supposed to be deferential to the lower court.³⁶ In the post-*Booker* era, one would have expected judges to regularly consider evidence-based practices, neuroscientific insights into conditions like addiction, or the impact of toxic stress and childhood adversity. They have not done so. Instead, the new rehabilitation is reflected only at the periphery of federal sentencing—a pretrial diversion program in a handful of courts, a drug-treatment program in others, a reentry program

34. Nancy Gertner, *Judicial Discretion in Sentencing—Real or Imagined*, 28 FED. SENT'G REP. 165, 166 (2016) (footnotes omitted).

35. 543 U.S. 220 (2005). In 2005, the Supreme Court made the Federal Sentencing Guidelines advisory, not mandatory, to remedy a Sixth Amendment challenge to them. *See id.* at 246.

36. In a series of decisions post-*Booker*, the Supreme Court authorized district courts to set a sentence based on its “reasonableness” in the light of the very general statutory factors in 18 U.S.C. § 3553(a) (2012), regardless of whether such a sentence was within the Guidelines range. And substantive appellate review of such a sentence would be under an abuse of discretion standard, the most deferential standard of all. *Booker*, 543 U.S. at 261–64; *see also* *Nelson v. United States*, 555 U.S. 350, 352 (2009) (per curiam) (reversing a within-Guideline sentence, holding that “[t]he Guidelines are not only *not mandatory* on sentencing courts; they are also not to be *presumed* reasonable”); *Spears v. United States*, 555 U.S. 261, 265–66 (2009) (ruling that a sentencing judge could reject advisory Guidelines based solely on policy considerations); *Kimbrough v. United States*, 552 U.S. 85, 101–02 (2007); *Gall v. United States*, 552 U.S. 38, 51 (2007) (holding that a sentencing judge could consider factors regardless of whether they were allowable under the Guidelines). According to one judge, the Guidelines “are finally just guidelines.” John Gleeson, *The Sentencing Commission and Prosecutorial Discretion: The Role of Courts in Policing Sentence Bargains*, 36 HOFSTRA L. REV. 639, 660 (2008). While these principles have been interpreted differently in appellate courts throughout the country, it is clear that a reasoned decision varying from the Guidelines’ rigidity should survive substantive appellate review. For example, of the 61,866 defendants sentenced between 2006 and 2014 in trial courts in the Eleventh Circuit, the court held that just fifteen sentences were substantively unreasonable. *United States v. Rosales-Bruno*, 789 F.3d 1249, 1274 (11th Cir. 2015) (surveying downward variance sentences in the Eleventh Circuit). At an April 2, 2014 Federalist Society event at the Harvard Law School, in which the author participated, Judge Reena Raggi of the Second Circuit noted that few if any district court sentences were reversed since *Booker*. Judge Edith Jones of the Fifth Circuit went further, complaining that the “‘reasonableness’ determination . . . defies appellate explanation” because appellate courts “have no principled way to disagree with, much less overturn, such disparate sentences.” *See* Memorandum from Edith H. Jones, Chief Judge, U.S. Court of Appeals for the Fifth Circuit to the U.S. Sentencing Comm’n 4 (Nov. 20, 2009), <http://www.ussc.gov/sites/default/files/pdf/amendment-process/public-hearings-and-meetings/20091119-20/Jones.pdf> [<https://perma.cc/9JDB-KHDN>]. Judge Danny Boggs of the Sixth Circuit expressed a similar sentiment, writing in dissent, “I find it difficult to express a way in which a judge can adequately say that a sentence is ‘too much’ or ‘too little’ in any form of words.” *United States v. Funk*, 534 F.3d 522, 531 (6th Cir.) (Boggs, J., dissenting), *reh’g en banc granted, opinion vacated*, No. 05-3708, 2008 U.S. App. LEXIS 27700 (6th Cir. Dec. 18, 2008).

here, a veterans' court there—all the while the Guidelines approach is unchanged.

Indeed, recent neuroscience has suggested that the Guidelines sentencing approach has affected the sentencer's brain in profound ways, which affects how policymakers should go about changing the system.

*C. The Sentencer's Brain
and the Institutions That Support It*

In recent years, neuroscientists have focused their attention on the sentencer's brain, the neural underpinnings of punishment decisions. One study described the results of a functional magnetic resonance imaging (fMRI) experiment in which subjects' brains were scanned while they were evaluating culpability and while they were evaluating the magnitude of punishment.³⁷ Different brain regions were involved in the respective tasks: subjects used their right dorsolateral prefrontal cortices to determine culpability and their social and affective processing brain networks (particularly the right amygdala, medial prefrontal cortex, and posterior cingulate cortex) to assign sentences.³⁸ The former were brain regions classically associated with cognitive tasks, like numerical processing, while the latter were brain regions associated with social-emotional processing, like intuitions.³⁹

Applying these conclusions, one scholar suggested that the Guidelines framework has taken these two aspects of third party punishment and divided them between different institutions.⁴⁰ The Commission is tasked with making those “intuitive and nonrational . . . decisions,” which formerly judges made, while federal judges are tasked with applying them using their cognitive-quantitative functions.⁴¹

In effect, the Guidelines enabled judges to cede moral decision making to another body; their task became the application of an apparently rational formula to the case at hand—a purely cognitive process. The change would have been salutary if the Guidelines that federal judges were applying formulaically were fair, appropriate, driven by evidence, transparent, or evidence based. As described above, they were not. Federal sentencing

37. See Joshua W. Buckholtz et al., *The Neural Correlates of Third-Party Punishment*, 60 NEURON 930 (2008).

38. *Id.* at 932–33, 935.

39. *Id.* at 934, 936 (describing the “‘cold’ deliberate computations supported by the prefrontal cortex and ‘hot’ emotional processes represented in socio-affective brain networks.”). Indeed, I wonder whether this is simply the neuroscience version of what scholars studying bureaucracies have said for years—that bureaucracy is supposed to drive emotion and subjective desire out of administrative decisions. See, e.g., PETER M. BLAU & MARSHALL W. MEYER, BUREAUCRACY IN MODERN SOCIETY (2d ed. 1956).

40. See Rebecca Krauss, Comment, *Neuroscience and Institutional Choice in Federal Sentencing Law*, 120 YALE L.J. 367, 369 (2011).

41. *Id.*

embodied the illusion of a rational process, but in reality was something else—what one writer described as “equal nonsense for all.”⁴²

To be sure, the same social-emotional processing involved in punishment decisions also enabled racist and stereotypical thinking pre-Guidelines. The challenge going forward is to create a system that acknowledges that sentencing an individual involves more than the application of a formula, that it involves judgment and discretion, all the while avoiding the pitfalls of the pre-Guidelines regime. This would be a system informed by appellate review, and even peer review, with evidence-based guidance from neuroscience, social psychology, and psychiatry—not mandatory diktats.

Such a system would have to abandon the other impediments to meaningful reform that psychologists and neuroscientists have identified in the federal system. For example, so long as there are numerical guidelines, they will skew the results of sentencing—what social psychologists call “anchoring.” Judges are apt to “come up with or evaluate numbers by focusing on a reference point (an anchor) and then adjusting up or down from that anchor.”⁴³ The Guidelines manual—with its 300 odd pages of directives and a numerical grid—provides a readymade anchor.⁴⁴ Sentencing procedures that have evolved around a Guidelines structure would have to change. Guidelines sentencing, at least in some courts, is rote; post-*Booker* discretion should take more time, more resources, different training and analysis, different sources of information, a different kind of monitoring, and, as I describe below, different evidentiary rules.

II. THE SENTENCING CONTEXT: GOOD ENOUGH EVIDENCE

The context in which sentencing decisions are made has not materially changed from the days of rehabilitation, even as sentencing shifted from a purely discretionary system to a mandatory, structured one. It is a setting in which evidence, including expert evidence, is not tested as rigorously as it is at trials, with important implications for neuroscience and the new rehabilitation.

When rehabilitation was the dominant philosophy, there were few if any limits on the information that the judge was supposed to have. It made no more sense to limit the kind of information that a judge could receive and rely on at sentencing in exercising his “clinical” role—to cure the “moral disease”—than to limit the information available to a medical doctor in

42. Erik Luna, *Gridland: An Allegorical Critique of Federal Sentencing*, 96 J. CRIM. L. & CRIMINOLOGY 25, 81 (2005) (quoting Albert W. Alschuler, *The Failure of the Sentencing Guidelines: A Plea for Less Aggregation*, 58 U. CHI. L. REV. 901, 918 (1991)).

43. Stephanos Bibas, *Plea Bargaining Outside the Shadow of Trial*, 117 HARV. L. REV. 2463, 2515 (2004).

44. Nancy Gertner, *What Yogi Berra Teaches About Post-Booker Sentencing*, 115 YALE L.J. POCKET PART 137, 138 (2006), <http://yalelawjournal.org/forum/what-yogi-berra-teaches-about-post-booker-sentencing#> [<https://perma.cc/9RKG-WA3W>].

determining a diagnosis.⁴⁵ Over time, different standards of proof and evidence evolved between the trial stage and the sentencing stage.⁴⁶

The trial stage is the stage of constitutional rights, formal evidentiary rules, and proof beyond a reasonable doubt. At sentencing, the rules of evidence do not apply. Hearsay and character evidence is admissible.⁴⁷ The standard of proof is the lowest in the criminal justice system: a fair preponderance of the evidence. Additionally, the risk of error is allocated differently at trials and at sentencing. Many of the rules of evidence applicable at trial are justified by the concern that a presumptively innocent man not be convicted; the risk of error is on the prosecution. In some cases, potentially probative evidence is excluded, not simply based on the risk of a wrongful conviction, but also based on concerns about the decision maker, a lay jury. Character evidence, particularly evidence of prior crimes, is excluded because the jury may overvalue it, finding a propensity to commit crimes, which is inconsistent with the presumption of innocence.⁴⁸ But once a defendant is convicted, the rules change: the constitutional protections are minimal, the emphasis shifts from protecting the innocent to seeking the truth,⁴⁹ and the decision maker is a judge, presumed to be capable of separating the wheat

45. See Gertner, *From Omnipotence to Impotence*, *supra* note 4, at 527. *Williams v. New York*, 337 U.S. 241 (1949), reflected this approach. The jury convicted Williams of first degree murder and recommended life imprisonment. The judge disagreed, sentencing him to death. While Williams had no criminal record, the judge, relying on information in the presentence report that was inadmissible at trial, concluded that the defendant had committed a string of uncharged burglaries, that he had a “morbid sexuality,” and that he was a “menace to society.” *Id.* at 244. “Retribution is no longer the dominant objective of the criminal law,” the Court declared. *Id.* at 248. Rather, “[r]eformation and rehabilitation of offenders have become important goals of criminal jurisprudence.” *Id.* Any restrictions upon a trial judge’s ability to obtain pertinent information “would undermine modern penological procedural policies.” *Id.* at 250. See generally Claire McCusker Murray, *Hard Cases Make Good Law: The Intellectual History of Prior Acquittal Sentencing*, 84 ST. JOHN’S L. REV. 1415 (2010) (discussing *Williams*).

46. See Nancy Gertner, *Sentencing Reform: When Everyone Behaves Badly*, 57 ME. L. REV. 569, 571 (2005).

47. In a policy statement, the Commission declared that the sentencing judge may consider relevant information without regard to the rules of evidence, so long as the information has “sufficient indicia of reliability to support its probable accuracy.” U.S. SENTENCING GUIDELINES MANUAL § 6A1.3(a) (U.S. SENTENCING COMM’N 2015). On its face, the standard seems somewhat more stringent than the “minimal indicium of reliability” of the pre-Guidelines era. See *United States v. Miele*, 989 F.2d 659, 663–64 (3d Cir. 1993) (quoting *United States v. Baylin*, 696 F.2d 1030, 1040 (3d Cir. 1982)). The Commission commentary noted that under pre-Guidelines practice, sentencing factors were often determined informally, in part because offense and offender characteristics “rarely had a highly specific or required sentencing consequence.” See U.S. SENTENCING GUIDELINES MANUAL § 6A1.3 cmt. (U.S. SENTENCING COMM’N 1997). In contrast, under the Guidelines, resolution of disputed facts has “a measurable effect on the applicable punishment.” *Id.* But while the Commission has suggested that “[m]ore formality” is unavoidable if sentencing is to be accurate and fair, the law is murky as to how far “[m]ore formality” extends. *Id.*; e.g., *United States v. Little*, 61 F.3d 450, 453 n.2 (6th Cir. 1995).

48. See Judith M.G. Patterson, *Evidence of Prior Bad Acts: Admissibility Under the Federal Rules*, 38 BAYLOR L. REV. 331, 331 (1986).

49. Murray, *supra* note 45, at 1424–25. See generally Nancy Gertner, *Circumventing Juries, Undermining Justice: Lessons Learned from Criminal Trials and Sentencing*, 32 SUFFOLK U. L. REV. 419 (1999).

from the chaff without the need for the usual rules. In this very different setting, the floodgates are open to all sorts of evidence, including bad character evidence, evidence of the defendant's remorse, prior crimes charged and uncharged, and even acquitted conduct.⁵⁰

Significantly, *Daubert* does not apply at sentencing. The standard at sentencing is that the evidence must have "sufficient indicia of reliability to support its probable accuracy,"⁵¹ nothing like Federal Rule of Evidence 702 and its attendant decisional law. While the scholarly literature is replete with criticisms of the application of *Daubert* in trial settings, expert testimony at sentencing raises even more significant problems. For example, Dean David Faigman and others have described the "G2i" problem: the problem of drawing inappropriate inferences about individuals from group data.⁵² Inferences from group data, however, are frequently admitted in individual sentencing proceedings in the form of actuarial data about risk assessment, testimony about recidivism rates, or general experiential accounts about gang behavior. Indeed, because this is a setting in which folk generalizations about character, deterrence, and recidivism are too often bandied about, it is unlikely that a court would strictly limit expert testimony on "G2i" grounds even as a matter of judicial discretion.

Neuroscience testimony could well be offered by prosecutors to show aggravating factors and by defense lawyers to show mitigating factors. While Professor Deborah Denno's longitudinal studies found no instance of the prosecution using neurogenetic evidence as an aggravating factor in capital cases, the past may not predict the future, particularly in noncapital cases where the rules are more relaxed.⁵³ After all, federal courts did not enhance

50. See generally Alan C. Michaels, *Trial Rights at Sentencing*, 81 N.C. L. REV. 1771 (2003). While mandatory guidelines and mandatory minimums attached determinate and severe consequences to sentencing findings, for example, about drug quantity and criminal record, relaxed sentencing procedural rules (a legacy from the past sentencing regime) made those factors easier to prove.

51. *United States v. McCaskey*, 9 F.3d 368, 380 (5th Cir. 1993) (quoting U.S. SENTENCING GUIDELINES MANUAL § 6A1.3(a) (U.S. SENTENCING COMM'N 1992)); accord *United States v. Ferron*, 357 F.3d 722 (7th Cir. 2004).

52. David L. Faigman et al., *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417, 420 (2014) (describing the G2i problem as the "gap between conventional scientific practice and ordinary trial practice involves the challenge of reasoning from group data to decisions about individuals (an analytical process that we designate as 'G2i'). . . . [A]ll expert evidence, whether based on controlled experimental research or years of experience, presents G2i issues. Experts testify to such matters as the conditions likely to lead to false confessions, the indicia of schizophrenia, factors that contribute to eyewitness misidentification, the cancer-causing properties of benzene, and thousands more. These are all general—population-based—statements about the empirical world. They are the 'G' of G2i and represent the ordinary perspective of most research and most expertise. However, in the courtroom, the operative questions pertain to the particular case at hand, the 'i' of G2i: Did the suspect falsely confess? Does the defendant have schizophrenia? Was the witness's eyewitness identification accurate? Did benzene cause the plaintiff's leukemia?").

53. See generally Deborah W. Denno, *Courts' Increasing Consideration of Behavioral Genetics Evidence in Criminal Cases: Results of a Longitudinal Study*, 2011 MICH. ST. L. REV. 967. And in the short term at least, there are practical difficulties for the prosecution to compel neurogenetic or neurological evidence from an unwilling defendant. See Teneille

procedural protections in noncapital sentencing, even as sentences have increased. In effect, there is capital sentencing, with some protections,⁵⁴ and the “ordinary sentencing,” largely without.

The rules of relevance also are considerably more relaxed at sentencing. At trial, to determine the relevance of a particular brain defect, a court would be concerned about the causal relationship between it and the crime at issue. But at sentencing, the issues are broader. It does not matter whether the defendant’s addiction *caused* his illegal behavior, ostensibly a trial question. The issue is whether his addiction impairs his potential for rehabilitation, a sentencing question. A judge might sentence an addict who committed a bank robbery differently than someone who is not an addict, even if that addiction did not cause the crime, because what it takes to restore his life may be different. The brain lesion identified by a neurologist may not have diminished the defendant’s capacity to commit the crime, but it could be an impediment to his ability to recover from the consequences of his conviction.

In short, neuroscience offers considerable promise—as I describe below—but considerable dangers, in a setting that, until now, has not been geared toward a critical examination of the evidence.

III. NEUROSCIENCE AT SENTENCING: THE “NEW REHABILITATION”

The “new rehabilitation”—now informed by neuroscience and evidence-based science—offers the possibility of yet another shift in American sentencing away from retribution toward an approach more finely tailored to the individual, his needs, and his future.⁵⁵ The challenge will be to avoid the perils of the “old rehabilitation” and its overreliance on faith. Grounded in empirical findings, there should be less concern about disparity in sentencing by judicial actors. When a judge sentences a drug addict to an addiction-treatment program with a proven track record, that sentence can serve as a precedent for similarly situated offenders. Judicial training can go beyond Guidelines-speak. Judges can be trained in how to evaluate what works and what does not and what offenders would be amenable to which sentencing alternatives. A sentencing commission can evaluate programs in terms of their efficacy, publicize the best practices in sentencing drug-addicted offenders or juveniles rather than enforcing compliance with the Guidelines.

Neuroscience can help inform administrators about prison conditions—the impact of solitary confinement on prisoners, the unique issues associated

Brown & Emily Murphy, *Through a Scanner Darkly: Functional Neuroimaging as Evidence of a Criminal Defendant’s Past Mental States*, 62 STAN. L. REV. 1119, 1133 (2010). *But see* Nita A. Farahany, *Incriminating Thoughts*, 64 STAN. L. REV. 351, 352 (2012).

54. *See* Carol S. Steiker & Jordan M. Steiker, *Opening a Window or Building a Wall?: The Effect of Eighth Amendment Death Penalty Law and Advocacy on Criminal Justice More Broadly*, 11 U. PA. J. CONST. L. 155, 158 (2009). The Supreme Court’s decision in *Miller v. Alabama*, 132 S. Ct. 2455 (2012), may spell a change in the Court’s willingness to scrutinize procedures in noncapital cases as well. *See generally* Nancy Gertner, *Miller v. Alabama: What It Is, What It May Be, and What It Is Not*, 78 MO. L. REV. 1041 (2013).

55. *See, e.g.*, Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Nothing and Everything*, 359 PHIL. TRANSACTIONS ROYAL SOC’Y LONDON B 1775 (2004).

with juvenile offenders, and the effect of prison violence. It can address programmatic issues within the walls—which programs work, which do not. It can help tailor postrelease programs by establishing a continuum of care, bearing in mind the impact of prolonged confinement.

But again, there are pitfalls. Some of the most important work on the impact of social and economic deprivation in early childhood may be entirely appropriate for policy discussions but is not necessarily helpful to individual sentencing. The National Scientific Council on the Developing Child, for example, has studied the impact of excessive or prolonged “activation of the stress response systems” on the brain architecture, learning, behavior, and long-term health. It concludes that “if the stress response is extreme, long lasting, and buffering relationships are unavailable to the child, the result can be toxic stress, leading to damaged, weakened bodily systems and brain architecture, with lifelong repercussions.”⁵⁶ These observations, while critically important to understand offenders, raise problems when applied to sentencing. Precisely because this description applies to so many offenders in the criminal justice system—as my own judicial experience suggests—it does not help to individualize any given one. The overwhelming majority of the young men I sentenced had some form of toxic stress during early development—from childhood abuse, trauma from witnessing a shooting (or being shot themselves), chaotic personal relationships, malnutrition, extreme poverty, et cetera. More significantly, the “toxic stress” literature does not offer a remedy. Indeed, precisely because it describes problems so intractable and results so difficult to reverse, it could have the same pitfalls as the old rehabilitation, namely providing a rationale for the longer imprisonment of these offenders.

Likewise, risk-assessment instruments, which enable a more informed choice about which offenders will recidivate than the judge’s “back of the envelope” intuition, may well be skewed by inappropriate generalizations based on race or gender. While these instruments ostensibly look only at demographic information, after decades of mass incarceration and racial bias in the criminal justice system, the demographics are themselves distorted, particularly by race.⁵⁷

And then there is the question of resources. The more neuroscientific evidence is introduced into sentencing proceedings, the more stress is put on the resources of the criminal justice system. There is surely a risk that only wealthy defendants will offer this evidence. For example, poorer defendants’ records suggested that when they acted up in high school, they were labeled disciplinary problems and expelled. Their subsequent criminal behavior would be presented before me without a mitigating explanation. For well-heeled offenders, in contrast, acting up in high school would be more likely

56. Nat’l Sci. Council on the Developing Child, *Excessive Stress Disrupts the Architecture of the Developing Brain* 1 (Harvard Univ. Ctr. on the Developing Child, Working Paper No. 3, 2014), http://developingchild.harvard.edu/wp-content/uploads/2005/05/Stress_Disrupts_Architecture_Developing_Brain-1.pdf [https://perma.cc/8V65-673R].

57. See, e.g., Sonja B. Starr, *Evidence-Based Sentencing and the Scientific Rationalization of Discrimination*, 66 STAN. L. REV. 803, 819 (2014).

to lead to a psychiatric referral and their subsequent criminal behavior cast in a more sympathetic light.

CONCLUSION

The discussion about the role of neuroscience in courts largely has focused on two settings: the culpability determination and capital cases, not ordinary sentencing. Culpability determinations raise important questions about criminal responsibility. But sentencing is different. It is not only backward looking, reevaluating culpability to a degree, but it is also forward looking, considering recidivism, deterrence, and rehabilitation. And, in making that far more complex determination, the sentencer should use all of the new tools at his disposal, so long as he understands the history and risks.