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HOW PROSECUTORS AND DEFENSE ATTORNEYS DIFFER IN THEIR USE OF NEUROSCIENCE EVIDENCE

Deborah W. Denno*

INTRODUCTION

Much of the public debate surrounding the intersection of neuroscience and criminal law is based on assumptions about how prosecutors and defense attorneys differ in their use of neuroscience evidence. For example, according to some commentators, the defense's use of neuroscience evidence will abdicate criminals of all responsibility for their offenses. In contrast, the prosecution's use of that same evidence will unfairly punish the most vulnerable defendants as unfixable future dangers to society.¹ This "double-edged sword" view of neuroscience evidence is important for flagging concerns about the law's construction of criminal responsibility and punishment: it demonstrates that the same information about the defendant can either be mitigating or aggravating depending on who is raising it.² Yet empirical assessments of legal decisions reveal a far more nuanced reality, showing that public beliefs about the impact of neuroscience on the criminal law can often be wrong.³

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1. See Deborah W. Denno, *The Myth of the Double-Edged Sword: An Empirical Study of Neuroscience Evidence in Criminal Cases*, 56 *B.C. L. REV.* 493, 496–97 (2015).

2. *Id.* at 496 (“[N]euroscience evidence can be portrayed as a potential ‘double-edged sword: it may diminish [a defendant’s] blameworthiness for his crime even as it indicates that there is a probability that he will be dangerous in the future.’”).

3. Wide-scale empirical research, recently completed in Canada, England, the Netherlands, the United States, and Wales, has been particularly effective in revealing

This Article takes an evidence-based and multidisciplinary approach to examining how courts respond to neuroscience evidence in capital cases when the defense presents it to argue that the defendant's mental state at the time of the crime was below the given legal requisite due to some neurologic or cognitive deficiency. A focus on a relatively specific aspect of criminal doctrine, especially one concerning defendants' mental states, enables a more fine-tuned comparison of how the prosecution and defense treat this evidence and the framework courts use for making decisions. The analysis relies on data from my "Neuroscience Study," a unique project evaluating every criminal case in the United States that has addressed neuroscience evidence over the course of two decades (1992–2012).⁴ Neuroscience constitutes "the branch of the life sciences that studies the brain and nervous system,"⁵ and it is not surprising that the role of neuroscience evidence in the justice system is considered controversial.⁶ However, an evidence-based approach rests on the premise that large-scale empirical research studies are among the most effective ways to combat distorted narratives of how neuroscience fits into the legal system's framework.⁷

Part I of this Article briefly describes my Neuroscience Study, some of the neuroscience evidence that comes into court, as well as my past findings concerning the different ways that prosecutors and defense attorneys use neuroscience evidence. Part II then examines thirty-nine capital cases that my Neuroscience Study uncovered in which the defense attempted to use neuroscience evidence to dismiss or diminish the defendant's level of intent either at the guilt phase or the penalty phase, along with a corresponding

incorrect beliefs. *See generally* Paul Catley & Lisa Claydon, *The Use of Neuroscientific Evidence in the Courtroom by Those Accused of Criminal Offenses in England and Wales*, 2 J.L. & BIOSCIENCES 510 (2015) (researching England and Wales); Jennifer A. Chandler, *The Use of Neuroscientific Evidence in Canadian Criminal Proceedings*, 2 J.L. & BIOSCIENCES 550 (2015) (researching Canada); Deborah W. Denno, *Concocting Criminal Intent*, 105 GEO. L.J. (forthcoming 2017) [hereinafter Denno, *Concocting Criminal Intent*] (researching the United States); Denno, *supra* note 1, at 493 (researching the United States); Deborah W. Denno, *The Place for Neuroscience in Criminal Law*, in PHILOSOPHICAL FOUNDATIONS OF LAW AND NEUROSCIENCE 69 (Dennis Patterson & Michael S. Pardo eds., 2016) (researching the United States); Nita A. Farahany, *Neuroscience and Behavioral Genetics in US Criminal Law: An Empirical Analysis*, 2 J.L. & BIOSCIENCES 485 (2016) (researching the United States); Lyn M. Gaudet & Gary E. Marchant, *Under the Radar: Neuroimaging Evidence in the Criminal Courtroom*, 64 DRAKE L. REV. 577 (2016) (researching the United States); C.H. de Kogel & E.J.M.C. Westgeest, *Neuroscientific and Behavioral Genetic Information in Criminal Cases in the Netherlands*, 2 J.L. & BIOSCIENCES 580 (2015) (researching the Netherlands).

4. Denno, *supra* note 1, at 500–04.

5. NEUROSCIENCE AND THE LAW: BRAIN, MIND, AND THE SCALES OF JUSTICE glossary at 206 (Brent Garland ed., 2004); *see also* OWEN D. JONES ET AL., LAW AND NEUROSCIENCE 762 (2014) (defining neuroscience as "[t]he scientific study of the structure and function of the nervous system; includes experimental and clinical studies of animals and humans").

6. *See supra* notes 1–3 and accompanying text (discussing the controversy concerning the double-edged-sword view of neuroscience in the criminal law).

7. Todd R. Clear, *Policy and Evidence: The Challenge to the American Society of Criminology: 2009 Presidential Address to the American Society of Criminology*, 48 CRIMINOLOGY 1, 2 (2010) ("It suddenly seems that everyone in the policy-making world, from professional associations to the White House, has accepted the importance of the evidence-based paradigm.").

rebuttal or counterargument from the prosecution.⁸ My Neuroscience Study also discovered a comparable number of noncapital cases in which the defense argued for a lower level mens rea, and this Article's selection of only capital cases controls for some of the vast differences between the two different types of litigation. Regardless, revelations concerning these "lower mens rea" cases can illuminate why the criminal justice system employs neuroscience evidence generally, as well as the way it answers some of the premier questions in the criminal law: How do we assess a defendant's mental state based upon the evidence we have before us? How do we really know what the defendant was intending?

My Neuroscience Study shows that most of these lower mens rea cases constitute ineffective assistance of counsel claims and therefore have a two-part doctrinal structure for courts to follow concerning the defense counsel's level of "deficiency" and the corresponding "prejudice" to the defendant.⁹ However it is unclear what kind of framework courts are supposed to apply in deciding when to allow relevant neuroscience evidence to fulfill the deficiency or prejudice standards in these claims. A substantial number of courts rely on a double-edged-sword type of analysis of the evidence to determine which factors are mitigating or aggravating. Yet this approach often relies on three presumptions: (1) the prosecution can successfully rebut or nullify whatever neuroscience information the defense presents as mitigating, (2) the prosecution can turn that same information into aggravating evidence that can become highly damaging to the defense, and (3) the prosecution can accurately speculate how positively or negatively a jury would view such neuroscience evidence as a whole. These unpredictable and dichotomous presumptions, however, overly simplify and skew the highly varied nature and purpose of neuroscience evidence, which is hardly universal.

This Article concludes that the lack of consistency and guidance among lower mens rea cases seemingly hinders a more effective application of neuroscience evidence in intent determinations. The real controversy behind the influx of neuroscience evidence in the criminal justice system is not whether it will be damaging to defendants, but whether it will be wrongly cabined when it could be put to good use. Such a direction is more likely if courts can go beyond the double-edged-sword approach and establish a more realistic framework. This Article endorses the "reasonable jurist[]"¹⁰ framework that one court has introduced and examines how such a criminal justice actor would view the evidence. The reasonable jurist standard recognizes the value of case-by-case determinations and the need to refrain from assumptions about how jurists will view particular types of evidence. Therefore, a reasonable jurist standard provides courts with a more realistic lens through which to assess the great range of neuroscience factors.

8. These cases are listed in this Article's appendix. *See infra* Appendix.

9. *See infra* notes 22–33 and accompanying text (discussing the doctrine and composition of ineffective assistance of counsel claims).

10. *Smith v. Dretke*, 422 F.3d 269, 278 (5th Cir. 2005); *see also infra* Part II.C (discussing the "reasonable jurist" standard).

An advantage of large-scale empirical research is that it enables researchers to pinpoint particular questions that would otherwise remain unanswered due to small sample sizes or other limitations. Questions about a defendant's level of intent lie at the heart of criminal law and its system of punishment. Insight on these issues opens a more productive inquiry as to how the system currently works, as well as how it *should* work.

I. NEUROSCIENCE AS A TOOL FOR THE PROSECUTION AND DEFENSE

This part discusses my Neuroscience Study as a backdrop for understanding how I selected this Article's thirty-nine "lesser-intent cases."¹¹ It also provides an overview of the defense attorney's obligations and the prosecutor's role, both in general terms and, more specifically, how the defense and the prosecution have applied neuroscience evidence differently in other types of criminal cases.

A. *The Neuroscience Study*

The Neuroscience Study consists of all criminal law cases (totaling 800) that addressed neuroscience evidence from January 1, 1992 to December 31, 2012. The cases were collected employing the Westlaw and LexisNexis legal databases, which enabled an ongoing examination of more than 100 factors that are relevant to how the criminal justice system handles such evidence. A detailed description of the Neuroscience Study's methodology and drawbacks—such as using only legal databases—has been provided elsewhere.¹² Nonetheless, the Neuroscience Study offers an opportunity to examine distributions and trends that has never before been available to researchers and to question undocumented assumptions about the role of neuroscience.

The Neuroscience Study's 800 cases consist of three categories: (1) 514 cases (64.25 percent) concern neuroscience evidence as it pertains to the defendant; (2) 247 cases (30.88 percent) concern neuroscience evidence as it pertains to the victim, primarily to prove the extent of a victim's brain injury; and (3) 39 cases (4.88 percent) concern neuroscience evidence as it pertains to both the defendant and the victim—because neuroscience evidence was relevant to both.¹³ Neuroscience evidence comprised two groups of tests: (1) "imaging tests," which are created by computer images of a human brain, such as an MRI or CT scan, and (2) "non-imaging tests," which consist of measurements provided by a medical professional for determining how an individual's brain functions, including intelligence tests and fine-motor ability tests.¹⁴ While many articles on the topic of neuroscience and law

11. *See infra* Appendix.

12. *See generally* Denno, *Concocting Criminal Intent*, *supra* note 3; Denno, *supra* note 1, at 500–01.

13. *See* Denno, *supra* note 1, at 501.

14. *See id.* at 500.

focus on imaging tests,¹⁵ both imaging and nonimaging tests are important for assessing brain dysfunction.¹⁶

Overall, the majority of defendants in the Neuroscience Study were convicted of murder, and most were eligible for the death penalty.¹⁷ This Article analyzes those capital cases in which defense attorneys used neuroscience evidence to argue that their clients could not have formed the criminal intent for which they were convicted and punished.

B. The Defense Attorney's Obligations

In a capital case, attorneys can introduce neuroscience evidence during the guilt-or-innocence phase, the penalty phase, or both.¹⁸ The guilt-or-innocence phase requires the prosecution to prove beyond a reasonable doubt that the defendant was guilty of committing the alleged crime.¹⁹ If, for example, an attorney can show that, for any one of a range of reasons, the defendant did not have the requisite intent for premeditated murder, then the defendant may be able to avoid a death sentence. During the penalty phase of a capital case, the jury has already found the defendant guilty of a capital crime; the question becomes whether the defendant should get the death penalty or a lesser punishment, typically a life sentence. Such a determination requires the jury to examine evidence of aggravation from the prosecution and evidence of mitigation from the defense. In most states, if the aggravating evidence outweighs the mitigating evidence, the defendant can be executed.²⁰ In general, defendants are constitutionally entitled to introduce neuroscience evidence in the death penalty sentencing phase because the rules of evidence are more relaxed than in the guilt phase.²¹

The U.S. Supreme Court has stressed that an attorney's performance should be assessed by "prevailing professional norms."²² For capital cases, this mandate requires a "thorough investigation"²³ of "all reasonably available mitigating evidence"²⁴ pertaining to a defendant's relevant

15. See generally JONES ET AL., *supra* note 5 (covering a broad range of topics regarding the connection between neuroscience and law, many of which involve a discussion of brain imaging).

16. See Denno, *supra* note 1, at 505 (noting that defendant cases rely on both imaging and nonimaging tests).

17. See *id.* at 501–02.

18. See John H. Blume & Emily C. Paavola, *Life, Death, and Neuroimaging: The Advantages and Disadvantages of the Defense's Use of Neuroimages in Capital Cases—Lessons from the Front*, 62 MERCER L. REV. 909, 914 (2011).

19. See *id.*

20. See *id.* at 914–15.

21. See Jane Campbell Moriarty et al., *Brain Trauma, PET Scans and Forensic Complexity*, 31 BEHAV. SCI. & L. 702, 712–13 (2013) (noting that in penalty phase hearings, where the rules of evidence generally do not apply, certain brain scans frequently have been admitted).

22. *Strickland v. Washington*, 466 U.S. 668, 688 (1984).

23. *Porter v. McCollum*, 558 U.S. 30, 39 (2009) (quoting *Williams v. Taylor*, 529 U.S. 362, 396 (2000)).

24. *Wiggins v. Smith*, 539 U.S. 510, 524 (2003) (quoting ABA GUIDELINES FOR THE APPOINTMENT AND PERFORMANCE OF COUNSEL IN DEATH PENALTY CASES guideline 11.4.1(C) (1989)).

background,²⁵ especially evidence that has the greatest influence on mitigation, such as a defendant's cognitive or intellectual deficiencies.²⁶ Attorneys who fail to conduct proper investigations are less equipped to engage in a reasonable strategic decision about whether to introduce evidence that could help a defendant.²⁷ These attorneys also are more susceptible to defendants' appeals claiming prejudicially deficient counsel in violation of the Sixth Amendment, known as an "ineffective assistance of counsel" or a *Strickland* claim.²⁸

In *Strickland v. Washington*,²⁹ the Court set forth a two-part test to assess the validity of ineffective assistance of counsel challenges, noting first that a counsel's performance must actually be "deficient" and second that this deficient performance must have "prejudiced" the defendant.³⁰ Proof of prejudice is challenging: not only must legal counsel be substantially inadequate, but such inadequacy must also constitute the "but-for" cause of the defendant's conviction.³¹

Defendants can bring *Strickland* claims for a wide range of reasons, and they often bring many in one case. Yet, the Neuroscience Study showed that *Strickland* claims are particularly important when it comes to neuroscience evidence: nearly all of the successful *Strickland* claims recorded among the Neuroscience Study's 553 defendant cases were based on an attorney's failure to appropriately investigate, gather, or understand neuroscience evidence.³² In general, courts presume attorneys will present relevant neuroscience evidence on behalf of their clients, and they are likely to render attorneys ineffective when they fail to do so.³³

Courts' concerns about the introduction of neuroscience evidence in court appear well justified. For example, in the Neuroscience Study, defendant-petitioners who were able to satisfy the *Strickland* requirements were often "afforded relief in the form of a new penalty phase, reversal of their conviction for a new trial, or a remand with instructions to hold a new evidentiary hearing."³⁴ In addition, the Neuroscience Study has shown that

25. *Porter*, 558 U.S. at 39.

26. This evidence is varied and wide ranging. See *Sears v. Upton*, 561 U.S. 945, 946 (2010) (discussing frontal lobe damage); *Porter*, 558 U.S. at 36 (discussing brain damage and cognitive defects in reading, writing, and memory); *Rompilla v. Beard*, 545 U.S. 374, 392 (2005) (discussing organic brain damage and significant cognitive impairments); *Tennard v. Dretke*, 542 U.S. 274, 287 (2004) (discussing impaired intellectual functioning); *Wiggins*, 539 U.S. at 535 (discussing diminished mental capacities); *Williams*, 529 U.S. at 396 (discussing borderline mental retardation).

27. See *Sears*, 561 U.S. at 954 ("We rejected any suggestion that a decision to focus on one potentially reasonable trial strategy . . . [can be] 'justified by a tactical decision' when 'counsel did not fulfill their obligation to conduct a thorough investigation of the defendant's background.'" (quoting *Williams*, 529 U.S. at 396)).

28. See *Strickland v. Washington*, 466 U.S. 668, 687–91 (1984) (establishing and discussing the test for ineffective assistance of counsel).

29. 466 U.S. 668 (1984).

30. *Id.* at 687.

31. See *id.* at 694.

32. Denno, *supra* note 1, at 507.

33. See *id.* at 499, 505–25.

34. *Id.* at 506–07.

courts regularly accept neuroscience evidence to mitigate punishments in the way that traditional criminal law has always allowed and for well-established legal purposes—to provide fact-finders with more complete and reliable information when determining a defendant’s sentence.³⁵

Using neuroscience evidence in capital sentencing, however, introduces a double-edged-sword problem, namely that the defendant’s brain is considered “too broken” and the defendant “too dangerous to have at large,” even if he is “somehow less culpable.”³⁶ Yet the Neuroscience Study’s findings indicate that neuroscience evidence is introduced into court nearly exclusively by defense attorneys as a vehicle to eliminate or mitigate their clients’ punishments. This is especially apparent when the evidence is applied to death penalty cases.

C. The Prosecutor’s Role

During the penalty phase of a capital trial, the majority of death penalty states take into account, as an aggravating factor, a defendant’s potential for future dangerousness.³⁷ The issue of future dangerousness has become especially significant in the last decade because of concerns that prosecutors will use neuroscience evidence as an aggravating factor indicating a defendant’s future proclivity to commit additional crimes.³⁸

Yet the Neuroscience Study found less support than previously speculated about concerns involving the prosecutor’s use of the evidence. Only very rarely is neuroscience evidence employed by prosecutors in rebuttal to suggest that defendants will engage in future dangerous behavior and therefore deserve more punishment.³⁹ I reported a similar result when I investigated every criminal case in the United States that addressed behavioral genetics evidence over the course of seventeen years (1994–2011).⁴⁰ While prosecutors and defense attorneys do use neuroscience

35. See *id.* at 504; see also James S. Walker & William Bernet, *Neuroscience and Legal Proceedings*, in *THE ORIGINS OF ANTISOCIAL BEHAVIOR: A DEVELOPMENTAL PERSPECTIVE* 245–49 (Christopher R. Thomas & Kayla Pope eds., 2012) (discussing how neuroscience evidence connects to behavior); Adam Lamparello, *Neuroscience, Brain Damage, and the Criminal Defendant: Who Does It Help and Where in the Criminal Proceeding Is It Most Relevant?*, 39 RUTGERS L. REC. 161, 178 (2012) (noting that “brain injuries such as frontal lobe disorder” can also be “substantially relevant and probative[] [b]ecause . . . the effects that accompany an injury to the frontal lobe” can make the defendant less culpable).

36. See Owen D. Jones & Francis X. Shen, *Law and Neuroscience in the United States*, in *INTERNATIONAL NEUROLAW: A COMPARATIVE ANALYSIS* 349, 362 (T.M. Spranger ed., 2012).

37. See Mitzi Dorland & Daniel Krauss, *The Danger of Dangerousness in Capital Sentencing: Exacerbating the Problem of Arbitrary and Capricious Decision-Making*, 29 LAW & PSYCHOL. REV. 63, 64–65 (2005).

38. See O. Carter Snead, *Neuroimaging and the “Complexity” of Capital Punishment*, 82 N.Y.U. L. REV. 1265, 1318–38 (2008) (discussing and critiquing then-current and aspirational uses of neuroscience in capital cases).

39. See Denno, *supra* note 1, at 527.

40. See Deborah W. Denno, *Courts’ Increasing Consideration of Behavioral Genetics Evidence in Criminal Cases: Results of a Longitudinal Study*, 2011 MICH. ST. L. REV. 967, 1027–28 [hereinafter Denno, *Courts’ Increasing*]. This investigation of behavioral genetics evidence was conducted over time by way of three of this author’s studies. See *id.*; see also Deborah W. Denno, *Behavioral Genetics Evidence in Criminal Cases: 1994–2007*, in *THE*

evidence differently from behavioral genetics evidence, prosecutors generally do not apply either type of evidence to suggest that a defendant will be a danger in the future. In the few cases in which prosecutors applied neuroscience evidence to suggest a defendant's future dangerousness, that tactic was based primarily upon using the evidence first introduced by a defense expert under circumstances in which the defense was not properly prepared.⁴¹ For example, among the Neuroscience Study's 553 defendant cases, only 10 cases—all of which were capital murder cases—involved prosecutors successfully using such evidence.⁴² Thus, the Neuroscience Study's findings suggest that, overall, there is little likelihood (at least at the present time) that neuroscience evidence introduced by the defense will be leveraged by the prosecution in an effort to prove the defendant's future dangerousness.

If prosecutors generally refrain from rebutting defense evidence by suggesting that defendants will be a future danger, do they engage in any efforts to introduce neuroscience on their own? The Neuroscience Study showed that they do but nearly exclusively for the one-third of the Neuroscience Study's cases (286 cases in total) that consider relevant neuroscience evidence from victims.⁴³ In other words, prosecutors (not defense attorneys) were nearly exclusively responsible for introducing the neuroscience evidence (most typically brain scans) into court for these victim-evidence cases. The Neuroscience Study also revealed that nearly half of these cases were based on medical expert testimony that the victims suffered from shaken baby syndrome, a medical diagnosis with controversial scientific underpinnings and potentially distorted legal ramifications.⁴⁴ The diagnosis often successfully serves as the sole foundation for a prosecutor's case; there is commonly no proof of the defendant's act or intent, except for the victim's brain scan and the accompanying medical expert testimony, because so little circumstantial evidence is available.⁴⁵

Shaken baby syndrome cases thus portray a troubling phenomenon in which the key element of mens rea is either unclear or overlooked altogether, and prosecutors are permitted to concoct intent out of brain scans that were admitted for the sole purpose of presenting the victim's injury. The Neuroscience Study further revealed that shaken baby syndrome cases represent a microcosm of prosecutorial misuse of victim neuroscience

IMPACT OF BEHAVIORAL SCIENCES ON CRIMINAL LAW 317 (Nita A. Farahany ed., 2009); Deborah W. Denno, *Revisiting the Legal Link Between Genetics and Crime*, 69 LAW & CONTEMP. SOC'Y 209 (2006).

41. See Denno, *supra* note 1, at 526–43.

42. See *id.* at 527–28.

43. See *supra* note 13 and accompanying text. The 247 cases pertaining to the victim as well as the 39 cases pertaining to both the victim and the defendant total to 286 cases that provide information on the victim (irrespective of whether 39 of those cases also provide information on the defendant).

44. Denno, *Concocting Criminal Intent*, *supra* note 3.

45. See *id.*

evidence more generally, particularly when determining a defendant's mental state.⁴⁶

Further differences between how the defense and the prosecution approach the application of neuroscience evidence in the courtroom are discussed in more detail elsewhere.⁴⁷ The key point is that the evidence can be quite a boon for prosecutors, who decide to introduce it for the purposes of assessing a victim's injury, especially a very young victim.⁴⁸ The following part offers a more targeted context for comparing how prosecutors and defense attorneys differ in their use of neuroscience evidence, with a focus on the defendant's level of intent. This lens provides a fuller understanding of how courts consider these arguments and evidence.

II. NEUROSCIENCE AND DEFENDANTS' MENS REA

This part takes an unprecedented look at the Neuroscience Study's capital cases in which neuroscience evidence was introduced to argue that defendants did not have the requisite mens rea to commit the crimes for which they were convicted. Essentially, defendants who commit capital crimes present neuroscience evidence to establish that their mental state at the time of the crime was below the given legal requirement (a lower mens rea) due to neurologic or cognitive deficiency. This part's discussion analyzes courts' failure to provide guidelines for evaluating such evidence, often shoehorning aggravating and mitigating circumstances into lump categories (either directly or indirectly) under a double-edged-sword dichotomy without explanation or support.

In the Neuroscience Study's 800 cases,⁴⁹ there are 81 cases (10.13 percent) in which the defense argued that the defendant did not have the necessary level of mens rea: 39 of these cases involved capital offenses and 42 involved noncapital offenses.⁵⁰ This part focuses only on the capital cases so that there is consistency among the legal issues the courts consider, especially given the diverse array of evidence and defendants. This Article's appendix lists the capital cases and a brief description of each to provide a sense of the disparate nature of the cases, even though they all involve the guilt and penalty phases of death penalty trials.⁵¹

46. *See id.*

47. *See generally* Denno, *Concocting Criminal Intent*, *supra* note 3 (focusing on the prosecution's use of neuroscience evidence); Denno, *supra* note 1 (focusing on the defense's use of neuroscience evidence).

48. For an excellent article on changing assumptions about prosecutorial ethics and misbehavior, see Bruce A. Green & Ellen Yaroshefsky, *Prosecutorial Accountability 2.0*, 92 NOTRE DAME L. REV. (forthcoming 2016).

49. *See supra* note 12 and accompanying text.

50. *See* Deborah W. Denno, *The Neuroscience Study's Eighty-One Cases in Which the Defense Argued that the Defendant Did Not Have the Necessary Level of Mens Rea* (January 2016) (on file with the *Fordham Law Review*) (highlighting the thirty-nine capital cases in yellow and the forty-two noncapital cases in green).

51. *See infra* Appendix.

A. *The Mens Rea Cases*

The defense was successful, either in whole or in part, in ten cases, or one-quarter (25.64 percent) of the thirty-nine lower mens rea cases.⁵² Success was measured, for example, by the defense's win of a claim of ineffective assistance of counsel or the court's dropping of a conviction or sentence for at least one crime.⁵³

Not surprisingly, more than three-quarters of the cases overall (thirty-one cases or 79.49 percent) constituted ineffective assistance of counsel claims.⁵⁴ All but two of the successful cases⁵⁵ were part of the ineffective assistance of counsel claims, meaning that over one-quarter (25.81 percent) of the ineffective assistance of counsel claims were successful.⁵⁶ Compared to nationwide statistics on successful ineffective assistance of counsel claim cases—which average 5 percent or less in the capital arena⁵⁷—cases involving claims of the nonuse or misuse of neuroscience evidence fare substantially better. Provisionally, then, this group of cases appears to be stronger for the defense than other types of ineffective assistance of counsel cases.⁵⁸

The neuroscience evidence bolsters a range of claims concerning why a defendant would not be capable of the level of mens rea required for a particular offense. In broad categories, defense strategies raise arguments that the defendant had evidence of “mental retardation” (that is, intellectual disability), intoxication (either at the time of the crime, over time, or both), diminished capacity, an inability to premeditate or deliberate and to form intent, brain abnormality, an inability to appreciate wrongfulness or the criminality of conduct, life stressors, and poor impulse control.⁵⁹ These

52. *See infra* Appendix. The successful cases are identified by a **A** in the appendix. Take note that some of these cases may be ongoing and what may be viewed as a success at the time of this Article's publication may change in time given the likelihood of future appeals. For further explication and documentation of these cases, see Deborah W. Denno, *Lower Mens Rea Capital Cases* (June 1, 2016) (on file with the *Fordham Law Review*).

53. *See* Denno, *supra* note 52.

54. *See infra* Appendix. The ineffective assistance of counsel cases are identified by a **B** in the appendix. In many cases, it is not clear whether the ineffective assistance of counsel claims occur at the guilt phase or the penalty phase, although in theory they could occur in both phases. *See* Denno, *supra* note 52.

55. These two cases were *United States v. Davis*, 611 F. Supp. 2d 472 (D. Md. 2009), and *People v. Bradford*, 929 P.2d 544 (Cal. 1997). *See infra* Appendix.

56. This statistic was derived by dividing the eight successful cases by the thirty-one cases involving claims of ineffective assistance of counsel, which equals 25.81 percent.

57. *See* Kenneth Williams, *Does Strickland Prejudice Defendants on Death Row?*, 43 U. RICH. L. REV. 1459, 1472–79 (2009) (discussing a survey of decisions by those circuits that were the most active in the death penalty and finding that the percentage of successful ineffective of assistance of counsel claims cases was generally less than 5 percent after *Wiggins v. Smith*, 539 U.S. 510 (2003), except for the Ninth Circuit, in which wins were slightly over 50 percent).

58. *See supra* note 32 and accompanying text (noting that ineffective assistance of counsel claims involving neuroscience evidence generally were substantially more successful than claims that did not involve neuroscience evidence).

59. *See infra* Appendix. These categories of claims are identified respectively by numbers **1**–**8** in the Appendix. For further discussion and documentation, see Denno, *supra* note 52. In 2010, Congress passed Rosa's Law, which required that all federal laws replace any

categories are not mutually exclusive but rather can occur simultaneously in the same case.

All of these arguments and claims rely on a wide range of neuroscience evidence and include both imaging and nonimaging tests.⁶⁰ The challenge is that courts lack sufficient guidance concerning the use of neuroscience, even under the framework of *Strickland*. On the one hand, the Supreme Court has made clear that neuroscience evidence is an important component of responsible lawyering for capital cases.⁶¹ On the other hand, courts seem ill-equipped to interpret such evidence, while the prosecution and defense present very different perspectives.

B. *The Troubling Power of the Double-Edged Sword*

This section examines several cases that most thoroughly exemplify the use of neuroscience evidence to demonstrate a lower mens rea and how courts have responded to the presentation of such evidence. With death penalty cases, litigation becomes complex as standards and outcomes change over the years, especially in ineffective assistance of counsel cases. The double-edged-sword framework is particularly pronounced, either directly or indirectly.

1. Speculative Distinctions Among Types of Evidence

Within the group of thirty-nine Neuroscience Study cases, *Evans v. Secretary, Department of Corrections*⁶² serves as an appropriate paradigm for laying out the key contours of the double-edged-sword arguments and, therefore, the different strategies of the prosecution and defense. In *Evans*, the defendant, Wydell Evans, shot and killed his brother's girlfriend while they argued about her purported infidelity involving Evans's brother.⁶³ Evans was convicted by a jury of first-degree murder and sentenced to death, after which a series of appeals led him to contend that his trial counsel was ineffective for failing to adequately investigate a substantial array of mental health mitigation information to present at the penalty phase.⁶⁴ This information included evidence of Evans's troubled childhood—school and medical records showed that he was hit by a car and diagnosed with a closed

mention of the term “mental retardation” with the term “intellectual disability,” in light of the movement by mental health organizations and scholars to shift the terminology in the area. Rosa's Law, Pub. L. No. 111-256, 124 Stat. 2643 (2010) (codified as amended in scattered sections of 20, 29, 42 U.S.C.). This Article continues to use the term “mental retardation,” however, to be consistent with the references made in legal practice and in court cases, which have not yet fully adopted this terminological transition.

60. See *infra* Appendix. For further discussion and documentation, see Denno, *supra* note 52.

61. See *supra* notes 22–27 and accompanying text (discussing some of the major Supreme Court cases).

62. 681 F.3d 1241 (11th Cir.), *vacated on reh'g en banc*, 686 F.3d 1321 (11th Cir. 2012), *trial court opinion aff'd on reh'g en banc*, 703 F.3d 1316 (11th Cir. 2013); see *infra* Appendix.

63. *Evans*, 681 F.3d at 1244.

64. *Id.* at 1250.

head injury, which also impaired his speech and language abilities.⁶⁵ Additional school records indicated that Evans had severe learning disabilities and behavioral problems, which escalated from anger and aggression to violence and poor impulse control toward others.⁶⁶

At Evans's evidentiary hearing, three mental health experts confirmed that Evans "had brain damage attributable to his head injury" that was demonstrated by IQ test-score differences and his learning disabilities.⁶⁷ Two of the experts also suggested that Evans "suffered from an uncontrollable rage reaction or impulse disorder as a result of the brain damage" and that, at the time Evans shot his victim, he was overtaken by rage, which his drinking fueled further.⁶⁸

The Eleventh Circuit agreed with Evans that his trial counsel was deficient and that this deprived Evans of the opportunity to have jury instructions issued on two mental health statutory mitigators.⁶⁹ The court also distinguished among the different types of evidence presented and explained the importance of evaluating certain deficiencies according to their degree and time of occurrence.⁷⁰ For example, the court noted "that evidence of Evans's teenage alcohol abuse and violence may have been a double edged sword, though only at a certain chronological point,"⁷¹ thereby suggesting that the sway of such evidence was particularly critical at certain stages in a person's development. Yet the court could not "agree that Evans's closedhead injury at the age of three, resulting brain damage, and academic and behavioral difficulties in school are more harmful than helpful, as the state courts concluded."⁷² As the Eleventh Circuit emphasized, "[j]ust the opposite is true."⁷³ Indeed, the court stressed that "undisputed brain damage resulting from a traumatic brain injury is inherently mitigating,"⁷⁴ thereby putting brain injury in a category of per se mitigating evidence. Thus, the Eleventh Circuit concluded that the Florida Supreme Court was wrong to find Evans's postconviction evidence to be irrelevant in a *Strickland* claim⁷⁵: had the jury heard it, "there is a reasonable probability that it would have returned with a different sentence."⁷⁶

In a rehearing en banc, however, the Eleventh Circuit vacated its prior decision,⁷⁷ holding instead that the state court's finding that Evans failed to establish prejudice was a reasonable application of *Strickland*.⁷⁸ Once again, the court used the double-edged-sword analysis, explaining that Evans failed

65. *Id.* at 1246.

66. *Id.* at 1246–47.

67. *Id.* at 1247 (quoting *Evans v. State*, 946 So. 2d 1, 7 (Fla. 2006)).

68. *Id.* (quoting *Evans*, 946 So. 2d at 8).

69. *Id.* at 1261–62.

70. *Id.* at 1268–70.

71. *Id.* at 1269.

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.* at 1270 (quoting *Wiggins v. Smith*, 539 U.S. 510, 536 (2003)).

77. *Evans*, 686 F.3d 1321.

78. *Id.* at 1328.

to show prejudice under *Strickland* “because the mitigation evidence was a ‘double-edged sword,’ that ‘would likely have been more harmful than helpful.’”⁷⁹ The en banc court relied on recent Supreme Court decisions, which established that prejudice could not be shown if the evidence either was not “clearly mitigating” or would have “opened the door to powerful rebuttal evidence.”⁸⁰ Likewise, the court noted that Eleventh Circuit precedent also would “hold that it is reasonable to treat the kind of evidence that Evans presented in his postconviction hearing as ‘a “two-edged sword,”” noting, for example, “that evidence of an ‘antisocial personality disorder [or] narcissistic personality disorder . . . [is] more harmful . . . than mitigating.’”⁸¹ Thus, the Supreme Court of Florida reasonably concluded that Evans’s new mental health theory of mitigation “would have opened the door to damaging evidence.”⁸²

The Supreme Court of Florida’s emphasis on a double-edged-sword analysis, while shared by other cases, is inadequate and speculative in several respects. First, as Evans rightly noted, “the Supreme Court of Florida failed to say enough and instead ‘assumed the evidence was more harmful than helpful.’”⁸³ Evans’s call for a more thorough response seems basic enough given the broad diversity of evidence that he provided and the court’s approach of treating it all the same and with little explanation. Attorneys are expected to present mitigation evidence, but they are given very little guidance on how to do so. If some evidence will be viewed as possibly more harmful than helpful, then it makes sense that a court would draw some distinctions. However, the Eleventh Circuit missed the point that Evans was trying to make. Instead, it suggested that Evans’s request for clarity “smacks of a ‘grading papers’ approach”⁸⁴ that would have federal habeas courts judge the quality of the state courts’ reasoning and thus put them in a tutelary position.⁸⁵ Yet, Evans is not introducing a tutelary role for the federal courts. Rather, he seems to be asking only that the Supreme Court of Florida take on a tutelary position for attorneys so that they would know which, and when, evidence is most mitigating.

Before its en banc decision, however, the Eleventh Circuit did start to draw distinctions among the different types of mitigating evidence, although it did not cite to support. For example, Evans’s drinking and violence as a teen could have been considered a double-edged sword up to a certain age,⁸⁶ while

79. *Evans*, 703 F.3d at 1327 (quoting *Evans v. State*, 946 So. 2d 1, 13 (Fla. 2006)).

80. *Id.* (citing *Cullen v. Pinholster*, 563 U.S. 170 (2011)).

81. *Id.* at 1328 (alterations in original) (first quoting *Suggs v. McNeil*, 609 F.3d 1218, 1231 (11th Cir. 2010); then quoting *Reed v. Sec’y, Fla. Dep’t of Corr.*, 593 F.3d 1217, 1248 (11th Cir. 2010)).

82. *Id.* at 1332–33 (quoting *Cummings v. Sec’y for the Dep’t of Corr.*, 588 F.3d 1331, 1367 (11th Cir. 2009)).

83. *Id.* at 1329 (quoting *Evans*, 946 So. 2d at 13).

84. *Id.* (quoting *Wright v. Sec’y for the Dep’t of Corr.*, 278 F.3d 1245, 1255 (11th Cir. 2002)).

85. *Id.* at 1329–30.

86. *Evans v. Sec’y, Dep’t of Corr.*, 681 F.3d 1241, 1269 (11th Cir.), *vacated on reh’g en banc*, 686 F.3d 1321 (11th Cir. 2012), *trial court opinion aff’d on reh’g en banc*, 703 F.3d 1316.

“Evans’s closedhead injury at the age of three, resulting brain damage, and academic and behavioral difficulties in school” would be considered mitigating.⁸⁷ While “undisputed brain damage resulting from a traumatic brain injury is inherently mitigating”⁸⁸ in the eyes of the Eleventh Circuit judges who initially heard Evans’s petition, the en banc court noted “that evidence of an ‘antisocial personality disorder [or] narcissistic personality disorder . . . [is] more harmful . . . than mitigating.’”⁸⁹

Whether these are the kinds of detailed explanations Evans was seeking, the Eleventh Circuit is at least trying to provide some justification for its decision. The court’s confidence seems deceptively appealing as a type of framework for analyzing evidence until it becomes clear that the court offers no guidance for attorneys to work within that framework.

2. When Aggravators Become Mitigators

The *Evans* Court’s response also does not consider the additional kinds of evidentiary complexities involved in the other lesser mens rea decisions assessing neuroscience. For example, in *Commonwealth v. Johnson*⁹⁰ the situation reverses: the defendant, who is convicted of deliberately premeditated murder, contended that the neuroscience evidence his trial attorney introduced was a potentially double-edged sword (or at least the defendant viewed the evidence as possibly being interpreted as aggravating instead of mitigating).⁹¹

According to appellate counsel, for example, it was wrong for trial counsel to characterize the defendant in his opening statement as someone who is “antisocial . . . [with] impulsive action or reaction to almost little or no provocation, and also typified by a lack of remorse, misconduct.”⁹² Yet trial counsel claimed that, not only were these the words that the testifying expert used, but also his “strategy was to convince the jury that the defendant could not premeditate, that he was compelled by intoxication and other forces in his personality to perpetrate a horrific crime based on a total absence of reason.”⁹³ The *Johnson* Court determined that trial counsel’s strategy was “justified” because it was fueled by counsel’s desire to argue the defendant’s lower level of intent to avoid a first-degree murder verdict.⁹⁴ In addition, trial counsel’s approach “was not ‘tantamount to an admission of his client’s guilt’ or an ‘abdication of] his client’s position.’”⁹⁵

Johnson therefore is more of a case about how presented evidence is handled, rather than a failure to present neuroscience evidence altogether.

87. *Id.*

88. *Id.*

89. *Evans*, 703 F.3d at 1328 (alterations in original) (quoting *Reed v. Sec’y, Fla. Dep’t of Corr.*, 593 F.3d 1217, 1248 (11th Cir. 2010)).

90. 754 N.E.2d 685 (Mass. 2001); see *infra* Appendix.

91. *Johnson*, 754 N.E.2d at 698.

92. *Id.* at 699 (alterations in original).

93. *Id.*

94. *Id.*

95. *Id.* (quoting *Commonwealth v. Triplett*, 500 N.E.2d 262, 267 (Mass. 1986)).

Here, the court's discussion of the ineffective assistance of counsel claim makes relative sense. All the evidence that defense counsel introduced was already presented by the experts, so the jury was exposed to this evidence as well. Also, the court recognized that defense counsel was applying this evidence to convince the jury that the defendant could not premeditate, thus supporting a lesser-intent argument. While the strategy was not successful, it could be considered reasonable (even though some attorneys may view it as risky). The case also illustrates that the distinction between "aggravating" and "mitigating" often depends on context and the goals that the defense is trying to achieve.

C. *The Draw of the "Reasonable Jurists" Standard*

These differing perspectives on what constitutes mitigating or aggravating evidence suggest that the double-edged-sword framework is simplistic and, at times, misleading. *Smith v. Dretke*,⁹⁶ however, offers a thorough *Strickland* analysis in which the court, when compared to the *Evans* Court, appears far more cautious and reluctant to speculate on how jurists would regard evidence.⁹⁷ The court also seems to advocate using a "reasonable jurist" standard and a reference to professional norms when discussing the adequacy of trial counsel's investigation and presentation of mitigating evidence.⁹⁸ While the prosecution argued that the neuroscience evidence could have been a double-edged sword if defense counsel presented it,⁹⁹ the court disagreed, finding that this neuroscience evidence should have been introduced because reasonable jurists could be convinced that it made the defendant less culpable.¹⁰⁰

Smith, who was convicted of capital murder, contended that trial counsel provided ineffective assistance by failing to investigate mitigation evidence pertaining to his cocaine and alcohol intoxication, his background and upbringing, and his prior disciplinary record from prison.¹⁰¹ According to the prosecution, however, trial counsel's decision to forgo introducing a "psychiatric professional" to testify about Smith's substance abuse was a reasonable strategic decision because of the prosecution's assessment that the evidence "could easily be a 'double edged sword.'"¹⁰²

In response, the court noted that "reasonable jurists could conclude that the district court's assessment of the ineffective assistance of counsel claim is debatable or wrong."¹⁰³ Citing Supreme Court precedent, if the trial court did in fact conduct some sort of investigation, the issue would be its adequacy in light of professional norms.¹⁰⁴ Smith's counsel, however, falsely claimed,

96. 422 F.3d 269 (5th Cir. 2005); *see infra* Appendix.

97. *See supra* Part II.B.

98. *Smith*, 422 F.3d at 278.

99. *Id.*

100. *Id.*

101. *Id.* at 273–74.

102. *Id.* at 278.

103. *Id.*

104. *Id.* at 278–80 (citing *Wiggins v. Smith*, 539 U.S. 510 (2003)).

among other things, that she engaged in extensive interviews with some family members and that her explanations for why she presented certain testimony conflicted with the testimony that was actually introduced into court.¹⁰⁵ “Reasonable jurists” could also consider whether trial counsel’s decision to forgo investigating “the psychological and biological impact of Smith’s substance abuse” comported with professional standards.¹⁰⁶ As the court explained, “In light of the scant mitigation evidence presented, reasonable jurists could debate whether the evidence Smith now proffers would have convinced a juror that Smith was less morally culpable such that life imprisonment, rather than the death penalty, was appropriate.”¹⁰⁷ The court determined that reasonable jurists could in fact conclude that the district court wrongly denied Smith’s ineffective assistance of counsel claim.¹⁰⁸

In essence, then, *Smith*—unlike *Evans*—exemplifies a court that does not seem as quick to make assumptions about the jury’s probable determinations in a given scenario. The court steers away from speculation, choosing instead to stress that reasonable jurists could debate this matter. In addition, the court discusses the adequacy of the defense’s trial investigation in relation to the “professional norms” discussed in Supreme Court precedent.¹⁰⁹ The court attempts to give this type of discussion some sort of framework, not necessarily as to the weight given to any specific piece of evidence but, rather, as to the amount of evidence that should be presented given what information is available.

1. Problematic Double-Edged-Sword Approaches

In contrast to *Smith*, other cases, such as *Nobles v. Johnson*,¹¹⁰ appear forced and formulaic in their efforts to take on a double-edged-sword approach. In *Nobles*, the defendant claimed that his trial counsel provided ineffective assistance because, had the jury heard evidence of defendant’s mental impairment from drugs and alcohol, it could have concluded that he had not deliberately committed the murders for which he was convicted.¹¹¹ Yet, the court’s determination was that the evidence was not sufficiently strong, helpful, or convincing in light of Nobles’s questionable claims of memory loss.¹¹² By finding that trial counsel’s omission of Nobles’s evidence was not prejudicial, the court seemingly concluded that the evidence would have been inconsequential.¹¹³ Regardless, the court determined that the effect of the evidence still could have been harmful.¹¹⁴ “The so-called ‘mitigating’ psychological evidence Nobles refers to was at

105. *Id.* at 281–82.

106. *Id.* at 283.

107. *Id.* at 284.

108. *Id.* at 278.

109. *Id.* at 279–80 (citing *Wiggins*, 539 U.S. at 522–23 and *Rompilla v. Beard*, 545 U.S. 374 (2005)).

110. 127 F.3d 409 (5th Cir. 1997).

111. *Id.* at 418.

112. *Id.* at 419.

113. *Id.* at 422.

114. *See id.*

best double-edged: not to present evidence of Nobles's volatile mental state, especially given counsel's decision to emphasize Nobles's non-violent history, was clearly reasonable trial strategy."¹¹⁵ Essentially, the prosecution's focus on the double-edged aspect of the evidence of Nobles's volatile mental state helped to convince the court that counsel's trial strategy was reasonable.

*Pike v. State*¹¹⁶ is another case where the defense counsel argued against an ineffective assistance of counsel claim, stressing that certain information was double-edged in nature.¹¹⁷ However, *Pike* is also noteworthy because it provides a three-pronged analysis based on counsel's failure to present mitigating evidence.¹¹⁸ This approach appears to be the *Pike* Court's attempt to provide a framework for detecting and weighing aggravating and mitigating factors.

Christa Pike was found guilty of premeditated first-degree murder and conspiracy to commit first-degree murder after testimony indicated that she had brutally tortured the victim, leading the jury to find two statutory aggravating circumstances.¹¹⁹ Pike claimed ineffective assistance of counsel due to her counsel's failure to present mitigation evidence that was already available and to uncover additional evidence.¹²⁰ Specifically, counsel chose not to present defendant's social history evidence either through lay witnesses or through expert testimony from the forensic psychologist who had examined Pike, claiming that the psychologist's materials in particular contained double-edged information.¹²¹ Yet, the *Pike* Court found such a rationale unjustifiable. Not only should trial counsel have known about the double-edged material as a result of communications with the psychologist, but also "the negative information could have been presented in a way to strengthen the mental illness diagnosis," especially since the prosecution eventually obtained the information regardless.¹²²

The Tennessee Supreme Court established a three-step framework for courts to follow in assessing the viability of an ineffective assistance of counsel claim based on trial counsel's failure to present mitigating evidence¹²³:

- (1) the reviewing court must first analyze the nature and extent of the mitigating evidence that was available and not presented;
- (2) the court must then determine whether substantially similar mitigating evidence was presented to the jury during either the guilt phase or the sentencing phase of the proceedings; and
- (3) the court must consider whether there was such

115. *Id.*

116. No. E2009-00016-CCA-R3-PD, 2011 WL 1544207 (Tenn. Crim. App. Apr. 25, 2011); *see infra* Appendix.

117. *Pike*, 2011 WL 1544207, at *50.

118. *Id.* (citing the three-prong approach and *Goad v. State*, 938 S.W.2d 363, 371 (Tenn. 1996)).

119. *Id.* at *1.

120. *Id.* at *49.

121. *Id.* at *50.

122. *Id.*

123. *Id.* (citing *Goad*, 938 S.W.2d at 371).

strong evidence of applicable aggravating factors that the mitigating evidence would not have affected the jury's determination.¹²⁴

The *Pike* Court determined that Pike had satisfied none of the three factors. First, while the forensic psychologist testified that there was a range of mitigation evidence that she thought could have been presented to the jury, counsel concluded it was best to limit some of the mitigation in an effort to control the negative aspects of it.¹²⁵ In addition, the court found that some of the information in the psychologist's report was "substantially similar" to that provided during the guilt and sentencing phases of the trial.¹²⁶ Lastly, the court also concluded that the aggravating factors so clearly outweighed the mitigating factors that the mitigation evidence would not have affected the jury regardless.¹²⁷ Therefore, Pike could not successfully establish that there was prejudice.¹²⁸

The *Pike* case is noteworthy for two reasons: (1) the court offers a three-part test to provide a framework for discussing the level of ineffective assistance of counsel, as well as the weighing of aggravating and mitigating factors, and (2) the court accepts defense counsel's argument that the forensic psychologist's materials presented double-edged information. While there may have been mitigating evidence that was not presented to the jury, the court had previously granted counsel's decision to limit at least some of that evidence in an effort to contain the negative aspects of it. At the same time, the *Pike* framework is not substantially different from a double-edged approach; it simply gives the court a more structured way of asking the questions, but the double-edged perspective remains.

2. Determining What Is "Reasonable"

The *Smith* "reasonable jurists" standard provides a framework for examining lower mens rea cases without being caught inside the double-edged-sword box. Of course, there are many decisions to be made about what a jurist could consider "reasonable" based upon issues raised by some of the Neuroscience Study's cases. For example, the *Evans* Court stressed that "undisputed brain damage resulting from a traumatic brain injury is inherently mitigating."¹²⁹ This circumstance seems to characterize the defendant in *Odle v. Calderon*.¹³⁰ He had experienced a lobectomy, after which he "was missing a piece of his brain the size of a grapefruit,"¹³¹ causing a varying array of mental deficiencies and behavioral problems

124. *Id.*

125. *Id.* at *51.

126. *Id.*

127. *Id.*

128. *Id.* at *52.

129. *Evans v. Sec'y, Dep't of Corr.*, 681 F.3d 1241, 1269 (11th Cir.), *vacated on reh'g en banc*, 686 F.3d 1321 (11th Cir. 2012), *trial court opinion aff'd on reh'g en banc*, 703 F.3d 1316 (2013).

130. 919 F. Supp. 1367 (N.D. Cal. 1996), *rev'd and remanded sub nom. Odle v. Woodford*, 238 F.3d 1084 (9th Cir. 2001); *see infra* Appendix.

131. *Odle*, 238 F.3d at 1089.

immediately after his trauma occurred. A reasonable jurist would likely view this information as critical to a mitigation analysis, but any determination under a *Smith* standard would not be as definitive as the standard the court suggests in *Evans*.

There are other questions. What is the appropriate scientific standard for mitigation? Depending on the issue being raised, some courts appear more willing to rely on so-called “objective tests,” rather than an expert’s testimony interpreting test results. In *Clayton v. Roper*,¹³² the Eighth Circuit determined that the trial court did not err in finding the defendant competent, given that “the court placed more emphasis on the objective findings from the tests the [expert] doctor performed than on [the expert’s] ultimate conclusion.”¹³³ Likewise, the court favored test results over the defense’s testimony from a neurologist and clinical psychologist. Those two experts stated that, as a result of the defendant losing about 8 percent of his brain tissue in a prior sawmill accident, coupled with his frequent alcohol use, defendant’s ability to form intent was compromised.¹³⁴ Yet, how does a court distinguish between an “objective” test and expert testimony? In what way is a test’s findings separate from an expert’s interpretation of the results? Would the court simply want the expert to testify, for example, that the defendant lost 8 percent of his brain tissue, and then leave it to the judge or jury to determine whether that loss would compromise a defendant’s ability to form intent? In *United States v. Battle*,¹³⁵ during its competency determination, the court noted that objectively graded personality tests conducted by experts for both sides suggested that the defendant did not suffer from a thought disorder of psychotic proportions.¹³⁶ A court may believe that a focus on objective tests may eliminate some ambiguity or guesswork from decision making, but such an approach also discards an important part of a criminal trial involving neuroscience evidence—expert testimony.

Additional considerations exist beyond the kinds of standards courts may use in assessing neuroscience evidence in lower mens rea determinations. For example, it is still unclear what long-term effect *Cullen v. Pinholster*,¹³⁷ and related cases, will have. *Cullen* is the Supreme Court’s decision restricting prisoners’ attempts to acquire federal habeas relief under the Antiterrorism and Effective Death Penalty Act of 1966.¹³⁸ The case is in the Neuroscience Study’s database because the defendant was plagued by a vast range of mental, personality, and behavioral disorders, and the Court used the opportunity to impose limits on capital defendants generally.¹³⁹ Regardless, neuroscience evidence is now so pronounced throughout the criminal justice

132. 515 F.3d 784 (8th Cir. 2008); *see infra* Appendix.

133. *Clayton*, 515 F.3d at 791.

134. *Id.* at 787–88.

135. 272 F. Supp. 2d 1354 (N.D. Ga. 2003); *see infra* Appendix.

136. *See Battle*, 272 F. Supp. 2d at 1362.

137. 563 U.S. 170 (2011); *see infra* Appendix.

138. *Cullen*, 563 U.S. at 174.

139. For a discussion of *Cullen*, see Denno, *Courts’ Increasing, supra* note 40, at 1021–27.

system that, while a case like *Cullen* may control its reach, the evidence is here to stay. The key question that remains is how we will deal with it.

CONCLUSION

The double-edged-sword framework is a common component of capital cases involving both aggravating and mitigating evidence. Yet, what constitutes aggravating as opposed to mitigating evidence is often in flux, a circumstance that can cause confusion and potential manipulation by prosecutors and defense attorneys alike, especially in cases involving neuroscience. By identifying and analyzing criminal cases in which defense attorneys contend that their clients did not possess the requisite level of intent, this Article attempts to expand the legal system's opportunities to use neuroscience evidence in reliable and valid ways. The guiding standards for doing so are critically important, however, and they must accommodate the nature of the litigation process and the actors involved in it. Increasingly, those standards must also welcome, when appropriate, the contributions of modern science in helping the system decipher one of society's great mysteries—how people think and how the legal system can better address the actions that result from those thoughts.

APPENDIX

THE NEUROSCIENCE STUDY: CAPITAL CASES IN WHICH NEUROSCIENCE
EVIDENCE WAS INTRODUCED TO ARGUE THAT THE DEFENDANT DID NOT
HAVE THE REQUISITE MENS REA

- ☒ Cases involving claims of ineffective assistance of counsel
- △ Cases in which the defense was successful

Cases in which the defendant had evidence of one or more key factors:

- ① mental retardation (intellectual disability)¹⁴⁰
- ② intoxication (involving either drugs or alcohol)
- ③ diminished capacity
- ④ an inability to premeditate and/or to form intent (typically for first-degree murder charges)
- ⑤ brain abnormality
- ⑥ an inability to appreciate wrongfulness or criminality of conduct
- ⑦ life stressors, including evidence of child abuse
- ⑧ poor impulse control

1. *Baumruk v. State*, 364 S.W.3d 518 (Mo. 2012) (en banc) (discussing the State's rebuttal evidence that, despite the brain injuries that resulted from the defendant being shot in the head twice, he was nevertheless deemed competent to stand trial and did not suffer from delusions or from a mental disease or defect).

☒ ① ⑥ ⑦

2. *Bean v. Calderon*, 163 F.3d 1073 (9th Cir. 1998) (finding that defense counsel was ineffective at the penalty phase of trial for failing to present sufficient psychiatric evidence that defendant suffered from mental retardation, posttraumatic stress disorder, brain damage, and habitual drug use in support of a diminished capacity defense).

☒ △ ① ② ③ ④

3. *Blanco v. Sec'y, Fla. Dep't of Corr.*, 688 F.3d 1211 (11th Cir. 2012) (finding that although the psychiatrist appointed by the trial court to assist petitioner in presenting mitigating evidence was unpersuasive, he was still effective in that the psychiatrist's preparation included a one-hour mental health evaluation of the defendant and review of records provided by other experts).

⑥

4. *Brant v. State*, 21 So. 3d 1276 (Fla. 2009) (upholding the proportionality of the defendant's death sentence based on the testimony of two defense expert witnesses who opined that, while the defendant's substance abuse problem aggravated his preexisting sexual obsessive disorder, substantially

140. *See supra* note 59 (discussing courts' usage of the term "mental retardation" rather than "intellectual disability").

impairing his ability to refrain from committing rape, he did not have any similar corresponding mental disorder that would have caused a similar type of impairment in his ability to refrain from committing murder).

② ③ ⑤

5. *Clayton v. Roper*, 515 F.3d 784 (8th Cir. 2008) (holding that the trial court did not err in finding the defendant competent based on the results of the objective psychiatrist tests, rather than on the defense's testimony from a neurologist and clinical psychologist that, as a result of the defendant losing about 8 percent of his brain tissue in a prior accident, coupled with his frequent alcohol use, defendant's ability to form intent was compromised).

④ ⑤

6. *Commonwealth v. Johnson*, 754 N.E.2d 685, 699 (Mass. 2001) (discussing the defense counsel's strategy to obtain a verdict less than first-degree murder by convincing "the jury that the defendant could not premeditate, that he was compelled by intoxication and other forces in his personality to perpetrate a horrific crime based on a total absence of reason").

⊠ ▲ ② ④

7. *Commonwealth v. Marshall*, 810 A.2d 1211, 1221 (Pa. 2002) (rejecting the defendant's claims of diminished capacity or mental impairment because the defense counsel found no signs of major mental illness, organic brain disease, or other malady, and finding the evidence of the defendant's voluntary intoxication insufficient to reduce his first-degree murder conviction as it failed to show that the defendant was so "overwhelmed or overpowered by [drugs] to the point of losing his faculties or sensibilities" at the time he murdered his wife and daughter (quoting *Commonwealth v. Tilley*, 595 A.2d 575, 580 (Pa. 1991))).

⊠ ② ③ ⑤

8. *Commonwealth v. Yancy*, 797 N.E.2d 371 (Mass. 2003) (finding that the defense counsel's failure to call the neuroradiologist who performed a single photon emission computerized tomography scan on the defendant's brain and found a temporal lobe abnormality to testify about the effect of the defendant's organic brain defect and drug use on his ability to premeditate did not render counsel ineffective because the neuroradiologist refused to testify to any link between the defendant's brain abnormality and his actions in killing the victims and thus would not have aided the defense).

⊠ ② ⑤

9. *Davis v. Greer*, 13 F.3d 1134 (7th Cir. 1994) (noting that the defense counsel was not ineffective for failing to present evidence of the defendant's mental illness, mental retardation, and troubled family background as requested by the defendant).

⊠ ⑤ ⑦

10. *Evans v. Sec'y, Dep't of Corr.*, 681 F.3d 1241 (11th Cir. 2012) (discussing, but ultimately denying, the claim that defense counsel failed to conduct a thorough investigation into the defendant's abusive childhood, his well-documented severe learning disability, and his medical and psychological history indicating that the defendant suffered from emotional handicap and an uncontrollable rage reaction or impulse disorder as a result

of brain damage), *vacated on reh'g en banc*, 686 F.3d 1321 (11th Cir. 2012), *trial court opinion aff'd on reh'g en banc*, 703 F.3d 1316 (11th Cir. 2013).

☒ ⑤ ⑦ ⑧

11. *Jackson v. Calderon*, 211 F.3d 1148 (9th Cir. 2000) (discussing the prejudicial impact during the penalty phase of the trial of defense counsel's failure to present any medical testimony of the defendant's drug intoxication at the time of the murder or any testimony that the defendant suffered abuse, neglect, and instability throughout his childhood and was diagnosed as schizophrenic; further noting that even if available PET scan evidence could establish that Jackson suffered some PCP-induced brain abnormality, the effect of such abnormality on the defendant's ability to premeditate, or form a specific intent at the time of the shooting, was not demonstrated); *see also* *Jackson v. Calderon*, CV 91-4249-R, 1997 WL 855516 (C.D. Cal. Nov. 14, 1997).

☒ ▲ ② ⑤ ⑦

12. *Jones v. Ryan*, 583 F.3d 626 (9th Cir. 2009) (finding defense counsel ineffective for failing to secure a mental health expert and seek neurological testing, as the evidence indicated that the defendant had a traumatic childhood fraught with mental and sexual abuse, brain injuries, multiple psychological disorders, and drug addiction issues, all of which would have impacted the jury's decision to impose the death penalty), *vacated*, 563 U.S. 932 (2011).

☒ ▲ ② ⑦

13. *Nelson v. State*, 43 So. 3d 20 (Fla. 2010) (explaining that the fact that the defendant had once tried to commit suicide and was on psychotropic medication does not mean he was incompetent or that the court was required to order a competency evaluation; in addition, because the defendant did not raise an insanity defense, the defense counsel could not be found deficient for failing to call the doctor who diagnosed the defendant with schizoaffective disorder as a witness).

☒ ① ⑥ ⑦

14. *Nobles v. Johnson*, 127 F.3d 409 (5th Cir. 1997) (rejecting on procedural grounds the defendant's claim of insufficient assistance of counsel based on the failure to present mitigating evidence regarding the defendant's traumatic childhood and his history of drug abuse and mental illness).

☒ ② ⑦

15. *Odle v. Calderon*, 919 F. Supp. 1367 (N.D. Cal. 1996) (discussing the plethora of mental health records and expert witnesses presented at trial to explain how the severe brain trauma and temporal lobe lobectomy suffered by the defendant following a car accident resulted in erratic behavior and personality changes to support the court's rejection of the defendant's claim of ineffective counsel), *rev'd and remanded sub nom.* *Odle v. Woodford*, 238 F.3d 1084 (9th Cir. 2001).

☒ ⑤

16. *Olsen v. State*, 67 P.3d 536 (Wyo. 2003) (finding that defense counsel was not ineffective for failing to argue the defense of mental incapacity

during the guilt phase of trial, despite several experts opining that the defendant suffered from an arteriovenous malformation rupture and alcohol intoxication at the time of the murders because there was sufficient premeditation and planning activity).

☒ Ⓐ ② ⑤

17. *People v. Beeler*, 891 P.2d 153 (Cal. 1995) (explaining that defendant's history of severe sexual, physical, and emotional abuse and prior psychological diagnoses of schizophrenia and disassociation did not support an inference of organic brain damage that would warrant defense counsel to seek neurological testing).

☒ ⑤ ⑦

18. *People v. Bradford*, 929 P.2d 544 (Cal. 1997) (analyzing how the State's expert witness rebutted the defense's theory that the defendant suffered from idiosyncratic intoxication, a form of psychomotor epilepsy, by pointing to the defendant's medical records, EEG results, and detailed statement to police to negate the suggestion that the defendant suffered any amnesia or history of brain trauma as required for said diagnosis).

Ⓐ ② ⑤

19. *People v. Mincey*, 827 P.2d 388 (Cal. 1992) (affirming the death sentence for the torture and murder of the defendant's child, where experts from both the defense and prosecution testified that the defendant was not suffering from organic brain damage, amphetamine psychosis, or any other disorder and opined that even a misguided attempt at child discipline can involve an intent to cause cruel pain and suffering requisite for a first-degree murder conviction).

⑦

20. *People v. Musselwhite*, 954 P.2d 475 (Cal. 1998) (noting that the central feature of the defendant's defense at trial was the claim that the defendant suffered from an organic brain defect (supported by the brain electrical activity mapping test) that, in conjunction with prolonged crack cocaine abuse, rendered him incapable of the deliberation and premeditation required to support a verdict of first-degree murder).

☒ ② ④ ⑤ ⑧

21. *Pike v. State*, No. E2009-00016-CCA-R3-PD, 2011 WL 1544207 (Tenn. Crim. App. Apr. 25, 2011) (affirming that counsel was not ineffective for failing to present mitigating evidence that the defendant suffered from brain damage; psychiatric disorders, including bipolar disorder and borderline personality disorder; a heterotopia, which is associated with mental retardation and epilepsy; and a history of severe substance abuse, physical abuse, and sexual abuse).

☒ ⑤ ⑦ ⑧

22. *Cullen v. Pinholster*, 563 U.S. 170 (2011) (holding that counsel was not ineffective for failing to investigate and present mitigating evidence, which included family members' criminal, mental, and substance abuse problems, and the defendant's medical and mental health history, such as his epileptic disorder).

☒ ⑤ ⑦

23. *Reid v. True*, 349 F.3d 788 (4th Cir. 2003) (finding that defense counsel was not ineffective for failing to pursue an insanity defense or a voluntary intoxication defense, despite expert testimony indicating that the defendant had suffered from brain damage and a seizure disorder and may have been too intoxicated to form the necessary intent to commit premeditated murder).

☒ ② ④ ⑤ ⑥

24. *Reynolds v. Bagley*, 498 F.3d 549 (6th Cir. 2007) (finding the psychologists retained by defense counsel sufficient under *Strickland*, where one of the psychologists was inexperienced, did not perform a CT scan, and only performed a five-minute neurological exam).

☒ ②

25. *Roberts v. Bowersox*, 61 F. Supp. 2d 896 (E.D. Mo. 1999) (explaining that the trial court's exclusion of evidence regarding defendant's crack cocaine usage did not violate due process, where two mental health experts and an EEG revealed that the defendant suffered from epileptiform and frontal temporal abnormalities, because if the defendant's brain abnormality did not result in sufficient diminished capacity to negate the required mental state, then voluntary intoxication, which aggravates the alleged abnormalities, does not serve to negate the mental state either).

☒ ② ③ ④ ⑤

26. *Samayoa v. Ayers*, 649 F. Supp. 2d 1102 (S.D. Cal. 2009) (opining that there was no prejudice, even if defense counsel was ineffective in failing to present information about the defendant's physical, emotional, and sexual abuse, his extreme poverty, or his familial history of drug and alcohol abuse to the mental health experts and to the jury as mitigation; that said, the court issued a certificate of appealability on one claim related to ineffective assistance of counsel because the court found that counsel's performance was likely deficient in preparing for and conducting the penalty phase of petitioner's trial), *aff'd*, 649 F.3d 919 (9th Cir. 2011); *see also* *People v. Samayoa*, 938 P.2d 2 (Cal. 1997).

☒ ▲ ⑤ ⑦

27. *Saranchak v. Beard*, 616 F.3d 292 (3d Cir. 2010) (explaining that trial counsel's failure to investigate and present an adequate diminished capacity defense did not prejudice the defendant due to the overwhelming evidence of the defendant's specific intent to commit the murders, despite testimony that the defendant suffered from auditory hallucinations, schizoaffective disorder, delusion, pathological paranoia, and a tenuous ability to apprehend reality).

☒ ② ③ ④ ⑤

28. *Schriro v. Landrigan*, 550 U.S. 465 (2007) (denying the defendant's ineffective assistance of counsel claim for failure of counsel to investigate additional mitigating evidence in light of the fact that the defendant had expressly refused and repeatedly interrupted his counsel's efforts to raise mitigating evidence and understood the consequences of these actions).

☒ ⑦

29. *Smith v. Dretke*, 422 F.3d 269 (5th Cir. 2005) (finding a cause of action where it was debatable whether trial counsel's failure to investigate

the psychological and biological impact of the defendant's long and extensive history of substance abuse was reasonable given the testimony that the defendant had been on a weeklong crack cocaine binge preceding the murder and could not remember committing the murder).

⊠ **A** **2**

30. *Smithers v. State*, 826 So. 2d 916 (Fla. 2002) (noting that testimony from a forensic psychiatrist, one of the State's expert witnesses, that the defendant had antisocial personality traits, such as lack of remorse for others, was of minor consequence and constituted harmless error and thus did not warrant granting the defendant's motion for mistrial).

5 **7**

31. *State v. Anderson*, 79 S.W.3d 420 (Mo. 2002) (en banc) (finding the State's expert testimony—that the defendant was in the normal range of intelligence, exhibited no pathological paranoia or delusional thinking, and had no brain damage—to be more credible and persuasive than defense's directly opposing testimony in deeming the defendant competent to stand trial).

4 **5**

32. *State v. Frogge*, 607 S.E.2d 627 (N.C. 2005) (reinstating the defendant's death sentence on the grounds that an MRI of the defendant's brain revealed no anomalies and that, even if counsel had pursued mitigating evidence of permanent residual effects of an earlier head injury at the time the defendant committed the murders, he still would not be excused).

⊠ **2** **3** **5**

33. *Summerlin v. Stewart*, 267 F.3d 926 (9th Cir. 2001) (discussing court-appointed psychiatric testimony that described the defendant as "functionally mentally retarded," with organic brain dysfunction, explosive personality disorder, paranoid personality disorder, and antisocial personality disorder yet found the defendant competent to stand trial and legally sane under the *M'Naghten* standard), *opinion withdrawn*, 281 F.3d 836 (9th Cir.), *reh'g en banc granted*, 310 F.3d 1221 (9th Cir. 2002), *rev'd and remanded sub nom. Schriro v. Summerlin*, 542 U.S. 348 (2004).

⊠ **1** **8**

34. *Thomas v. Gilmore*, 144 F.3d 513 (7th Cir. 1998) (finding that the defendant's trial lawyer was not at fault for failing to search the defendant's prison and school records, which might have provided an alternative theory of mitigation by revealing that the defendant was of below average intelligence, emotionally disturbed, and suffering from schizoid tendencies and a paranoid personality).

⊠ **7**

35. *Thompson v. Bell*, 373 F.3d 688 (6th Cir. 2004) (explaining that the decision to exclude relevant psychological evidence that the defendant suffered from organic brain damage and schizoaffective disorder, bipolar type, at the time of the offense and affirm the defendant's death sentence was based on procedural grounds), *rev'd*, 545 U.S. 794 (2005); *see also* *Thompson v. Bell*, 315 F.3d 566 (6th Cir. 2003).

⊠ **6**

36. *United States v. Battle*, 272 F. Supp. 2d 1354 (N.D. Ga. 2003) (discussing the district court's finding that the defendant was competent to stand trial and that despite the defendant's IQ of eighty-six, he could successfully fool an experienced psychiatrist regarding the genuineness of his claimed delusion of having implants that harassed him and monitored his thoughts); *see also* *United States v. Battle*, 264 F. Supp. 2d 1088 (N.D. Ga. 2003).

☒ ⑤ ⑥

37. *United States v. Davis*, 611 F. Supp. 2d 472 (D. Md. 2009) (discussing defense's evidence of the defendant's chaotic and violent home environment, well-documented and consistent history of intellectual and adaptive functioning deficits, and partial-complex seizure disorder, in finding the defendant mentally retarded and thus ineligible for imposition of the death penalty).

▲ ①

38. *White v. State*, 973 P.2d 306 (Okla. Crim. App. 1998) (reversing and remanding a first-degree murder conviction and death penalty sentence on the grounds that the lower court's exclusion of defense's mental health expert testimony supporting the defendant's claim that his voluntary intoxication affected his mental state and prevented him from forming malice aforethought was prejudicial and an abuse of discretion).

☒ ▲ ②

39. *Zink v. State*, 278 S.W.3d 170 (Mo. 2009) (en banc) (holding that the defendant's trial counsel was not ineffective for failing to obtain a PET scan of the defendant's brain in order to strengthen his diminished capacity defense because first, the use of PET scans to demonstrate any definite link between the defendant's brain abnormalities and his diagnosed personality disorder was not generally accepted in the scientific community and, second, even if the PET scan results did support the personality disorder diagnoses, the defendant's cognitive abilities were normal and there was overwhelming evidence that the defendant acted with deliberation in committing the murder).

☒ ③ ⑤