

9-1-2014

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Suggested Citation

Andrea MacIver, The Clash Between Science and the Law: Can Science Save Nineteen-year-old Dzhokhar Tsarnaev's Life?, 35 N. Ill. U. L. Rev. 1 (2014).

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The Clash Between Science and the Law: Can Science Save Nineteen-year-old Dzhokhar Tsarnaev’s Life?

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I. INTRODUCTION

On April 15, 2013, two bombs exploded at the finish line of the Boston Marathon.¹ The bombs, made out of pressure cookers, explosive powder from fireworks, shrapnel, adhesive, and other materials,² left three dead and hundreds of others seriously injured.³ The bombing left the city of Boston—and the world—in shock. How could someone do something so hor-

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1. Indictment at ¶ 6, *United States v. Tsarnaev*, No. 13 CR 10200, 2013 WL 3215742 (D. Mass. June 27, 2013) [hereinafter *Tsarnaev Indictment*].

2. *Id.* at ¶ 8.

3. Deborah Feyerick, Ross Levitt & Matt Smith, *Boston bomb suspect pleads not guilty*, CNN.COM (July 11, 2013, 2:18 PM), <http://www.cnn.com/2013/07/10/us/boston-bombing-case/index.html?iref=allsearch>. See *Tsarnaev Indictment*, *supra* note 1, at ¶ 7.

rific to innocent men, women, and children on one of Boston's most celebrated days, Patriot's Day?⁴ In the days following the bombings, officials worked tirelessly to figure out that question, and they did. The bombers were Russian brothers, Dzhokhar Tsarnaev and Tamerlan Tsarnaev.⁵ Tamerlan Tsarnaev, the older twenty-six-year-old brother, was killed following an altercation with the police during which Dzhokhar Tsarnaev allegedly contributed to Tamerlan Tsarnaev's death by running over him in a vehicle.⁶ The younger brother, nineteen-year-old Dzhokhar Tsarnaev, survived and will live to face the consequences of his actions.⁷ However, before he faces those consequences, prosecutors and defense attorneys are going to have to answer some tough questions. Should Dzhokhar receive the death penalty? What will Dzhokhar's defense be? Why did Dzhokhar kill innocent people? What was motivating him? What role did his older brother have in planning and carrying out the bombings? Another question that may not be at the forefront of the litigation, but deserves addressing, is: was there something about nineteen-year-old Dzhokhar's brain that made him more susceptible to engaging in such horrific acts? And, if so, does that make him any more fit or less fit for the death penalty?

The United States' legal system has constantly been confronted with how it should deal with and punish youth⁸ who commit crimes. At one point, age had almost no bearing on one's sentence, and a child of at least seven years could be sentenced to death if he or she committed a heinous enough crime.⁹ However, flash forward to 2013 and the Supreme Court of the United States has placed significant limits on the sentences that may be imposed on youth under the age of eighteen: they cannot be sentenced to death, they cannot automatically receive life without the possibility of parole, and they cannot be sentenced to life without the possibility of parole for nonhomicide crimes.¹⁰ The driving factor behind these limitations has been, in large part, new scientific studies regarding the development of a

4. Tsarnaev Indictment, *supra* note 1, at ¶¶ 3-4.

5. Wayne Drash, *Acquaintances: The brain behind bombings is older brother*, CNN.COM (Apr. 23, 2013, 10:35 AM), <http://www.cnn.com/2013/04/21/us/tsarnaev-brothers-relationship/index.html?iref=allsearch>.

6. See Feyerick et al., *supra* note 3; Drash, *supra* note 5.

7. Feyerick et al., *supra* note 3.

8. Throughout this Article, the terms "youth," "minor," and "juvenile" will be used interchangeably. For purposes of this Article, unless specified otherwise or when using the terms to discuss judicial opinions, this term refers to persons nearing their mid-twenties and younger.

9. *In re Gault*, 387 U.S. 1, 16 (1967) (recognizing that children under the age of seven were considered to be incapable of possessing criminal intent and, thus, capital punishment was theoretically permitted for anyone over the age of seven).

10. See *Roper v. Simmons*, 543 U.S. 551, 560 (2005); *Graham v. Florida*, 560 U.S. 48 (2010); *Miller v. Alabama*, 132 S. Ct. 2455 (2012).

youth's brain. New developments in MRI imaging have made it possible to safely and effectively image a youth's brain, leading to the scientific finding that, contrary to what scientists originally thought, a youth's brain is generally not fully developed until the youth's early- to mid-twenties.¹¹ This lack of development in a youth's brain greatly affects their ability to make rational decisions, their culpability for their actions, and their ability to grow out of any criminal tendencies. As a result, it makes sense why the Supreme Court of the United States has limited the most serious legal punishments from being imposed on minors. However, if the studies show that the brain is not fully developed until one's early- to mid-twenties—which is exactly what the studies show—why has the Supreme Court drawn the line for these harshest penalties *at the age of eighteen*? The obvious answer is to save judicial resources and ensure consistency in sentencing across the board. This is why our country has sentencing statutes, of course. And while it is understandable why lines need to be drawn—even seemingly arbitrary lines—when that line is the difference between life and death, should that line be given a little more consideration?

Part A of this Article analyzes the Cruel and Unusual Punishment Clause of the Eighth Amendment and, specifically, how it has been interpreted in cases involving youth over the years.¹² Part B discusses new scientific studies regarding the development of the brain, and takes an in-depth look at the recent scientific findings that show the brain does not fully develop until a youth's early- to mid-twenties.¹³ Part C discusses how these studies have found their way into the Supreme Court's rulings in *Roper v. Simmons*, *Graham v. Alabama* and *Miller v. Alabama*.¹⁴ Part D discusses the implications of the clash between science and the law for juvenile offenders who commit crimes after the age of eighteen, but before their early-

11. Ann Maclean Massie, *Suicide on Campus: The Appropriate Legal Responsibility of College Personnel*, 91 MARQ. L. REV. 625, 661 (2008); Adam Ortiz, *Cruel and Unusual Punishment: The Juvenile Death Penalty: Adolescence, Brain Development, and Legal Culpability*, 2004 A.B.A. JUV. JUST. CENTER 1 (Jan. 2004), available at http://www.americanbar.org/content/dam/aba/publishing/criminal_justice_section_newsletter/crimjust_juvjus_Adolescence.authcheckdam.pdf; Claudia Wallis, *What Makes Teens Tick*, DEATH PENALTY INFORM. CENTER (May 10, 2004), <http://www.deathpenaltyinfo.org/what-makes-teens-tick-flood-hormones-sure-also-host-structural-changes-brain-can-those-explain-behav>; Jen Christensen, *Are you a heavy drinker? You'd be surprised*, CNN.COM (June 27, 2014, 5:47 PM), <http://www.cnn.com/2014/06/26/health/heavy-drinking-definition/> (“The frontal cortex -- the part of the brain that helps you make decisions and control impulsivity -- doesn't develop fully until you are 25.”).

12. See *infra* notes 16-96 and accompanying text.

13. See *infra* notes 97-134 and accompanying text.

14. See *infra* notes 135-152 and accompanying text.

to mid-twenties, with a focus on nineteen-year-old Dzhokhar Tsarnaev.¹⁵

II. BACKGROUND

A. HISTORICAL OVERVIEW OF YOUTH AND CRUEL AND UNUSUAL PUNISHMENT.

The Cruel and Unusual Punishment Clause of the Eighth Amendment states: “Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.”¹⁶ This provision is applicable to the states through the Fourteenth Amendment.¹⁷ The right encompassed in the Eighth Amendment “flows from the basic ‘precept of justice that punishment for crime should be graduated and proportioned to [the] offense.’”¹⁸ “By protecting even those convicted of heinous crimes, the Eighth Amendment reaffirms the duty of the government to respect the dignity of all persons.”¹⁹ While this principle is easily understood in theory, the application of this principle has proven to be more difficult as courts constantly grapple with the scope and reach of the Cruel and Unusual Punishment Clause.²⁰

1. *Stanford v. Kentucky*

In *Stanford v. Kentucky*, the Supreme Court of the United States held that it was not cruel and unusual punishment to sentence sixteen- and seventeen-year-olds convicted of murder to death.²¹ “A divided [*Stanford*] Court rejected the proposition that the Constitution bars capital punishment for juvenile offenders” older than fifteen but younger than eighteen.²² In coming to this conclusion, “[t]he Court noted that 22 of the 37 death penalty States permitted the death penalty for 16-year-old offenders, and, among

15. See *infra* notes 154-187 and accompanying text.

16. U.S. CONST. amend. VIII.

17. ARTHUR W. CAMPBELL, LAW OF SENTENCING § 8:18 (3d ed. 2004).

18. *Roper v. Simmons*, 543 U.S. 551, 560 (2005) (alteration in original) (quoting *Atkins v. Virginia*, 536 U.S. 304, 311 (2002) (quoting *Weems v. United States*, 217 U.S. 349, 367 (1910))).

19. *Id.*

20. CAMPBELL, *supra* note 17. (“Because its core concept [of the cruel and unusual punishment clause] remains largely subjective, the Eighth Amendment ha[s] been frequently invoked by offenders and diversely applied by the courts. Only in death sentences had the High Court applied it with relative clarity, consistency, and frequency.”).

21. *Stanford v. Kentucky*, 492 U.S. 361, 380 (1989).

22. *Roper*, 543 U.S. at 556 (commenting on the holding in *Stanford*).

these 37 States, 25 permitted it for 17-year-old offenders.”²³ As such, the Court found that “there was no national consensus sufficient to label a particular punishment cruel and unusual.”²⁴

On the same day the Court decided *Stanford*, it also decided *Penry v. Lynaugh*, which held that the Eighth Amendment also did not mandate a categorical ban on the death penalty for persons who are mentally retarded.²⁵ In coming to this conclusion, the Court found that only two states had banned the imposition of the death penalty on those who are mentally retarded and that was not “sufficient evidence . . . of a national consensus.”²⁶ Further, despite arguments from Penry’s attorneys that sentencing a mentally retarded person to death was the effective equivalent of sentencing a seven-year-old child to death, the Court held that it could not “conclude that the Eighth Amendment precludes the execution of any mentally retarded person of Penry’s ability convicted of a capital offense simply by virtue of his or her mental retardation.”²⁷

2. *Atkins v. Virginia*

Flash forward fourteen years to 2002 and the Supreme Court, in *Atkins v. Virginia*, held that the execution of mentally retarded offenders was cruel and unusual punishment and such a punishment *would* violate the Eighth Amendment.²⁸ In coming to this conclusion, the *Atkins* Court found that mental retardation diminishes personal culpability, even where the offender may be able to distinguish right from wrong.²⁹ Similarly, the Court found that the impairments of mentally retarded offenders make it less defensible to impose the death penalty as retribution for past crimes as imposing the death penalty is less likely to have any real deterrent effect.³⁰ Based on

23. *Id.* at 562.

24. *Id.* (quoting *Stanford v. Kentucky*, 492 U.S. 361, 370-71 (1989) (internal quotation marks omitted)).

25. *Penry v. Lynaugh*, 492 U.S. 302 (1989).

26. *Id.* at 334.

27. *Id.* at 340.

28. *Atkins v. Virginia*, 536 U.S. 304 (2002).

29. *Id.* at 318.

30. *Id.* at 319-20.

[C]linical definitions of mental retardation require not only subaverage intellectual functioning, but also significant limitations in adaptive skills such as communication, self-care, and self-direction that became manifest before age 18. Mentally retarded persons frequently know the difference between right and wrong and are competent to stand trial. Because of their impairments, however, by definition they have diminished capacities to understand and process information, to communicate, to abstract from mistakes and learn from experience, to

those findings, the Court concluded that there was a national consensus against executing mentally retarded persons, despite its finding to the contrary a decade earlier, and held that imposing the death penalty on mentally retarded offenders would constitute cruel and unusual punishment in violation of the Eighth Amendment.³¹

3. *Roper v. Simmons*

In *Roper v. Simmons*, the Court reconsidered the question of whether the Eighth Amendment's Cruel and Unusual Punishment Clause permitted the execution of a juvenile offender who was over the age of fifteen but younger than eighteen.³² In *Roper*, seventeen-year-old Christopher Simmons murdered a woman.³³ Nine months later, at the age of eighteen, Simmons was tried and sentenced to death.³⁴ Prior to the murder, Simmons had discussed his plan to murder the victim with two friends, Charles Benjamin and John Tessmer.³⁵ Together, the group of friends carried out the plan,³⁶ which involved breaking and entering into the woman's house, tying up her hands and feet, placing duct tape over her eyes and mouth, transporting her to the state park, and throwing her body from a bridge into the Meramec River, where she drowned.³⁷ Simmons bragged about the murder before he was arrested at school, and he openly discussed the murder after being arrested.³⁸

The State charged Simmons with burglary, kidnapping, stealing, and first-degree murder and sought the death penalty as punishment.³⁹ In sup-

engage in logical reasoning, to control impulses, and to understand the reactions of others. There is no evidence that they are more likely to engage in criminal conduct than others, but there is abundant evidence that they often act on impulse rather than pursuant to a premeditated plan, and that in group settings they are followers rather than leaders.

Id. at 318.

31. *Id.* at 321. "Construing and applying the Eighth Amendment in light of our 'evolving standards of decency,' we therefore conclude that such punishment is excessive and that the Constitution 'places a substantive restriction on the State's power to take the life' of a mentally retarded offender." *Atkins v. Virginia*, 536 U.S. 304, 321 (2002). (quoting *Ford v. Wainwright*, 477 U.S. 399, 405-06 (1986)).

32. As stated above, the Court had previously found in 1989 that executing such a juvenile did not violate the Eighth Amendment.

33. *Roper v. Simmons*, 543 U.S. 551, 556-57 (2005).

34. *Id.* at 556.

35. *Id.*

36. Charles Benjamin assisted Simmons in the murder, but John Tessmer left before the two had departed for the woman's home. *Id.*

37. *Roper*, 543 U.S. at 556-57.

38. *Id.* at 557.

39. *Id.*

port of its request for the death penalty, the State presented the following aggravating evidence: “[T]he murder was committed for the purpose of receiving money; was committed for the purpose of avoiding, interfering with, or preventing lawful arrest of the defendant; and involved depravity of mind and was outrageously and wantonly vile, horrible and inhumane.”⁴⁰ The defense argued that Simmons’s young age should serve as a mitigation factor to his sentence, “remind[ing] the jurors that juveniles of Simmons’ [sic] age cannot drink, serve on juries, or even see certain movies, because ‘the legislatures have wisely decided that individuals of a certain age aren’t responsible enough.’”⁴¹ Yet, despite these arguments, Simmons was sentenced to death.⁴² Simmons challenged his conviction and sentence claiming that he had received ineffective assistance of counsel.⁴³ The court found that no constitutional violations occurred in the handling of his case and denied him post-conviction relief.⁴⁴ Simmons appealed this finding, but the Missouri Supreme Court affirmed the lower court’s decision.⁴⁵ The federal courts also denied Simmons’s petition for a writ of habeas corpus.⁴⁶

Following what would have appeared to be the end of Simmons’s efforts for post-conviction relief, the Supreme Court decided *Atkins v. Virginia*. *Atkins*, as stated earlier, held that the Eighth and Fourteenth Amendments prohibited the execution of mentally retarded persons. Based upon the holding in *Atkins*, Simmons filed a new petition for post-conviction relief claiming that the Constitution prohibited the execution of an offender who was under the age of eighteen at the time he committed the crime.⁴⁷ The Supreme Court of Missouri agreed with Simmons’s argument, and the United States Supreme Court subsequently granted certiorari on the issue.

The Supreme Court of the United States affirmed the Missouri Supreme Court’s holding, and found that the Eighth and Fourteenth Amendments of the Constitution prohibited the imposition of the death penalty on an offender who was under the age of eighteen at the time he or she committed the crime.⁴⁸ The Court based its decision, which was a deviation from its past holdings, upon the following eight propositions:

(1) “The evidence of national consensus against the death penalty for juveniles is similar, and in some

40. *Id.* at 557.

41. *Id.* at 558.

42. *Roper v. Simmons*, 543 U.S. 551, 558 (2005).

43. *Id.*

44. *Id.* at 559.

45. *Id.* at 559.

46. *Id.*

47. *Roper v. Simmons*, 543 U.S. 551, 559 (2005).

48. *Id.* at 560.

respects parallel, to the evidence *Atkins* held sufficient to demonstrate a national consensus against the death penalty for the mentally retarded.”⁴⁹

(2) “Second, Congress considered the issue when enacting the Federal Death Penalty Act in 1994, and determined that the death penalty should not extend to juveniles.”⁵⁰

(3) “As in *Atkins*, the objective indicia of consensus in this case . . . provide[d] sufficient evidence that today our society views juveniles . . . as ‘categorically less culpable than the average criminal.’”⁵¹

(4) General maturity-related differences between juveniles under 18 and adults demonstrated that “juvenile offenders cannot with reliability be classified among the worst offenders.”⁵²

(5) The reasoning applied by a plurality of the court concerning the immaturity of people under the age of 16 in *Thompson v. Oklahoma*—where the court had held that the Eighth Amendment prohibited imposition of the death penalty for offenses committed when offenders were under 16—applied to all offenders under 18.⁵³

(6) Once the diminished culpability of juveniles was recognized, it was “evident that the penological justifications [(restitution and deterrence)] for the death penalty appl[ied] to them with lesser force than to adults.”⁵⁴

(7) “The age of 18 is the point where society draws the line for many purposes between childhood and

49. *Id.* at 564.

50. *Id.* at 567.

51. *Id.* (quoting *Atkins*, 536 U.S. at 316).

52. *Roper v. Simmons*, 543 U.S. 551, 569 (2005).

53. *Id.* at 574 (citing *Thompson v. Oklahoma*, 487 U.S. 815 (1988)).

54. *Id.* at 571.

adulthood.”⁵⁵

(8) “[T]he United States [was] the only country in the world that continue[d] to give official sanction to the juvenile death penalty.”⁵⁶

Although much of the *Roper* decision focused upon the international and national consensus regarding the death penalty and juveniles,⁵⁷ the opinion also made it clear that the Court had taken into consideration the “diminished culpability of juveniles” in its ruling.⁵⁸ Specifically, the Court noted: (1) “[a] lack of maturity and an underdeveloped sense of responsibility are found in youth more often than in adults and are more understandable among the young[.]”⁵⁹ (2) “juveniles are more vulnerable or susceptible to negative influences and outside pressures, including peer pressure[.]” and (3) “the character of a juvenile is not as well formed as that of an adult.”⁶⁰ The Court further noted that “these differences render suspect any conclusion that a juvenile falls among the worst offenders.”⁶¹ The Court also pointed out that the deterrent effect of imposing the death penalty was weak with teenagers because teenage offenders are not likely to make the same cost-benefit analysis as adults prior to committing crimes.⁶²

In acknowledging that the Court in *Roper* was making a break from past precedent, Justice Stevens and Justice Ginsberg made the following remarks in their concurring opinion:

Perhaps even more important than our specific holding today is our reaffirmation of the basic principle that informs the Court’s interpretation of the Eighth Amendment. If the meaning of that Amendment had been frozen when it was originally drafted, it would pose no impediment to the execution of 7-year-old children today.⁶³

55. *Id.* at 574.

56. *Id.* at 575.

57. The court recognized that at the time *Roper* was decided, nationally thirty states prohibited the death penalty for juveniles, and internationally the United States was the only country in the world that had not “turned its face against the juvenile death penalty.” *Roper v. Simmons*, 543 U.S. 551, 557 (2005).

58. *Id.* at 571.

59. *Id.* at 569 (quoting *Johnson v. Texas*, 509 U.S. 350, 367 (1993)).

60. *Id.* at 569-70.

61. *Id.* at 570.

62. *Roper v. Simmons*, 543 U.S. 551, 572 (2005).

63. *Id.* at 587 (Stevens, J., concurring).

Further, “[i]n the best tradition of common law, the pace of evolution is a matter for continuing debate; but that our understanding of the Constitution does change from time to time has been settled since John Marshall breathed life into its text.”⁶⁴

However, despite the Court’s efforts in legitimizing its ruling, which was a clear deviation from precedent, the Court recognized problems that would inevitably arise as a result of its ruling:

Drawing the line at 18 years of age is subject, of course, to the objections always raised against categorical rules. The qualities that distinguish juveniles from adults do not disappear when an individual turns 18. By the same token, some under 18 have already attained a level of maturity some adults will never reach. For the reasons we have discussed, however, a line must be drawn. The plurality opinion in *Thompson* drew the line at 16. In the intervening years the *Thompson* plurality’s conclusion that offenders under 16 may not be executed has not been challenged. The logic of *Thompson* extends to those who are under 18. The age of 18 is the point where society draws the line for many purposes between childhood and adulthood. It is, we conclude, the age at which the line for death eligibility ought to rest.⁶⁵

More assertively pointing out the issues that arise by drawing the line for the death penalty at the age of eighteen, Justice O’Connor wrote the following in her dissenting opinion:

The Court’s decision today establishes a categorical rule forbidding the execution of any offender for any crime committed before his 18th birthday, no matter how deliberate, wanton, or cruel the offense. . . . [The majority opinion] fails to establish that the differences in maturity between 17-year-olds and young “adults” are both universal enough and significant enough to justify a bright-line prophylactic rule against capital punishment of the former. The Court’s analysis is premised on the differences *in the aggregate* between juveniles and

64. *Id.*

65. *Id.* at 574.

adults, which frequently do not hold true when comparing individuals. . . . Chronological age is not an unfailing measure of psychological development, and common experience suggests that many 17-year-olds are more mature than the average young “adult” Indeed, the age-based line drawn by the Court is indefensibly arbitrary—it quite likely will protect a number of offenders who are mature enough to deserve the death penalty and may well leave vulnerable many who are not.⁶⁶

Justice Scalia’s dissent went even further than Justice O’Connor’s comments by attacking the underlying science that was relied upon by the Court in drawing the line for death at the age of eighteen. Justice Scalia noted that the American Psychological Association (APA), which provided the Court with scientific evidence showing that persons under the age of eighteen lack the ability to take moral responsibility for their decisions, “ha[d] previously taken precisely the opposite position before this very Court.”⁶⁷ Justice Scalia explained, “Given the nuances of scientific methodology and conflicting views, courts—which can only consider the limited evidence on the record before them—are ill equipped to determine which view of science is the right one.”⁶⁸ Furthermore, according to Justice Scalia, even if the Court did take the scientific evidence presented before it at face value, such evidence was only able to show that “*on average*” or “*in most cases*” juveniles under the age of eighteen are unable to take moral responsibilities for their actions.⁶⁹

4. *Graham v. Florida*

Nearly five years after *Roper* was decided, the Supreme Court was faced with yet another case involving a juvenile and the Cruel and Unusual Punishment Clause. In *Graham v. Florida*, sixteen-year-old Terrance Jamar Graham was initially arrested for attempted armed robbery, which he plead guilty to and spent less than one year in jail.⁷⁰ While on probation, and less than six months after being released from jail, Graham was arrested again and found guilty of armed burglary and attempted armed robbery.⁷¹ For such a sequence of crimes, Graham received the maximum sentence al-

66. *Id.* at 601-02 (O’Connor, J., dissenting).

67. *Roper v. Simmons*, 543 U.S. 551, 617 (2005). (Scalia, J., dissenting).

68. *Id.* at 618 (Scalia, J., dissenting).

69. *Id.* (Scalia, J., dissenting) (emphasis in original).

70. *Graham v. Florida*, 560 U.S. 48, 53 (2010).

71. *Id.* at 53-57.

lowed in Florida: life imprisonment for the armed burglary and fifteen years for the attempted armed robbery.⁷² Graham appealed his sentence to the Supreme Court of the United States, and after granting certiorari, the Court was tasked with answering the following question: “whether the Constitution permits a juvenile offender to be sentenced to life in prison without parole for a nonhomicide crime.”⁷³ In the end, a divided Court held that sentencing a juvenile to life without the possibility of parole for a nonhomicide crime was unconstitutional because it violated the Eighth Amendment’s prohibition against cruel and unusual punishment.⁷⁴ Consistent with the majority opinions in *Atkins* and *Roper*, the *Graham* court focused heavily upon “the evolving standards of decency that mark the progress of a maturing society.”⁷⁵ The Court also acknowledged the scientific studies regarding juveniles that had been discussed in *Roper* and stated that “[n]o recent data provide reason to reconsider the Court’s observations in *Roper* about the nature of juveniles. As petitioner’s *amici* point out, developments in psychology and brain science continue to show fundamental differences between juvenile and adult minds.”⁷⁶ As such, “*Graham* [held] that the Eighth Amendment requires the state to afford the juvenile offender a ‘meaningful opportunity to obtain release based on demonstrated maturity and rehabilitation,’ and that ‘[a] life without parole sentence improperly denies the juvenile offender a chance to demonstrate growth and maturity.’”⁷⁷ The Court further found that “[e]ven if the State’s judgment that Graham was incorrigible were later corroborated by prison misbehavior or failure to mature, the sentence was still disproportionate because the judgment was made at the outset[,]”⁷⁸ because a juvenile offender “will on average serve more years and a greater percentage of his life in prison than an adult offender.”⁷⁹

While the *Graham* Court, like the *Roper* Court, recognized that “[c]ategorical rules tend to be imperfect,” the *Graham* Court added that categorical rules are necessary when dealing with juveniles and the most severe criminal punishments, especially in light of the alternative, a case-

72. *Id.* at 59.

73. *Id.* at 52-53.

74. *Id.* at 62.

75. *Graham v. Florida*, 560 U.S. 48, 58 (2010). (quoting *Estelle v. Gamble*, 429 U.S. 97, 102 (1976) (quoting *Trop v. Dulles*, 356 U.S. 86, 101 (1958))).

76. *Id.* at 68 (“[P]arts of the brain involved in behavior control continue to mature through late adolescence. . . . Juveniles are more capable of change than are adults, and their actions are less likely to be evidence of ‘irretrievably depraved character’ than are the actions of adults.”) (quoting *Roper*, 543 U.S. at 570).

77. *People v. Caballero*, 282 P.3d 291, 294 (Cal. 2012).

78. *Graham*, 560 U.S. at 73.

79. *Id.* at 70.

by-case approach to sentencing.⁸⁰ According to the *Graham* Court, the case-by-case approach would be too difficult and it would be impossible for the court to “distinguish the few incorrigible juvenile offenders from the many that have the capacity for change.”⁸¹ A case-by-case approach was also inferior to a categorical rule because “it does not take account of special difficulties encountered by counsel in juvenile representation” because “the features that distinguish juveniles from adults also put them at a significant disadvantage in criminal proceedings.”⁸²

In his dissenting opinion, Justice Alito warned against the majority’s departure from the “[d]eath is different” distinction that was made in *Roper* and stated:

The Court now claims not only the power categorically to reserve the ‘most severe punishment’ . . . but also to declare that ‘less culpable’ persons are categorically exempt from the ‘second most severe penalty.’ No reliable limiting principle remains to prevent the Court from immunizing any class of offenders from the law’s third, fourth, fifth or fiftieth more severe penalties as well.⁸³

Justice Alito further noted that “even if it were relevant, none of this psychological or sociological data is sufficient to support the Court’s ‘moral’ conclusion that youth defeats culpability in *every* case.”⁸⁴

5. *Miller v. Alabama*

In 2012, the Supreme Court heard a consolidated case regarding two fourteen-year-old juveniles convicted of murder and sentenced to a mandatory term of life imprisonment without the possibility of parole.⁸⁵ In the first of the consolidated cases, fourteen-year-old Kuntrell Jackson accompanied by two other boys, planned to rob a video store.⁸⁶ On their way to the video store, they learned that one of the boys was carrying a shotgun.⁸⁷ Jackson stayed outside the video store for most of the robbery, but when he entered the store, one of his co-conspirators shot and killed the store clerk.⁸⁸ In the

80. *Id.* at 74.

81. *Id.* at 77.

82. *Id.* at 78.

83. *Graham v. Florida*, 560 U.S. 48, 103 (2010) (internal citations omitted).

84. *Id.* at 118 (quoting *Roper*, 543 U.S. at 570).

85. *Miller v. Alabama*, 132 S. Ct. 2455, 2457 (2012).

86. *Id.*

87. *Id.*

88. *Id.*

second of the consolidated cases, Evan Miller and a friend, after an evening of drinking and drug use with Miller's neighbor, beat the neighbor and set his trailer on fire, resulting in the neighbor's death.⁸⁹

In holding that the Eighth Amendment prohibits the automatic sentencing of life without the possibility of parole for minors convicted of homicide, such as these minors, the Court first discussed the precedent it laid out in *Roper* and *Graham*. "*Roper* and *Graham* establish that children are constitutionally different from adults for purposes of sentencing,"⁹⁰ and this contention, according to the evidence provided to the Court in *Miller*, has only grown stronger.⁹¹ Further, "*Roper* and *Graham* emphasized that the distinctive attributes of youth diminish the penological justifications for imposing the harshest sentences on juvenile offenders, even when they commit terrible crimes."⁹² In focusing on the ruling in *Graham*, the court noted that "nothing that *Graham* said about children is crime-specific. Thus, its reasoning implicates any life-without-parole sentence for a juvenile, even as its categorical bar relates only to nonhomicide offenses."⁹³ The Court then found that the mandatory sentencing schemes that had been imposed on each minor in *Miller* "precludes consideration of his chronological age and its hallmark features—among them, immaturity, impetuosity, and failure to appreciate risks and consequences."⁹⁴ As a result, the Court ruled that "the Eighth Amendment forbids a sentencing scheme that mandates life in prison without possibility of parole for juvenile offenders."⁹⁵

However, Justice Scalia, still dissenting in *Miller*, suggested:

Perhaps science and policy suggest society should show greater mercy to young killers, giving them a greater chance to reform themselves at the risk that they will kill again. But that is not our decision to make. Neither the text of the Constitution nor our precedent prohibits legislatures from requiring that juvenile murderers be sentenced to life without parole.⁹⁶

89. *Id.*

90. *Miller v. Alabama*, 132 S. Ct. 2455, 2464 (2012).

91. *Id.* at 2464 n.5 ("The evidence presented to us in these cases indicates that the science and social science supporting *Roper*'s and *Graham*'s conclusions have become even stronger.").

92. *Id.* at 2465.

93. *Id.* at 2458.

94. *Id.* at 2468.

95. *Miller v. Alabama*, 132 S. Ct. 2455, 2469 (2012).

96. *Id.* at 2482 (citation omitted).

Nevertheless, despite Justice Scalia's dissent in *Miller*, and all the other dissenting opinions in *Roper*, *Graham* and *Miller*, as of 2012, the Supreme Court has ensured that juveniles under the age of 18 cannot be sentenced to the death penalty, cannot be sentenced to life without the possibility of parole for a nonhomicide crime, and cannot automatically be sentenced to life without the possibility of parole for a homicide crime. As a result, the Supreme Court of the United States, with the help of new scientific MRI studies, has greatly changed the landscape of juvenile punishments from a time when children over the age of seven could justifiably be sentenced to death for their crimes. How much farther the Supreme Court will go in shielding youth criminals from the harshest criminal penalties is unknown.

III. ANALYSIS

A. NEW SCIENCE SHOWS THE BRAIN CONTINUES TO DEVELOP UNTIL ONE'S EARLY TWENTIES.

Juveniles have not changed; the imaging available to study their brains has changed. New imaging techniques, known as functional MRIs, have "changed the way scientists understand the development of the human brain as it progresses from childhood through adolescence and into adulthood."⁹⁷ By allowing professionals to safely image a youth's brain on numerous occasions over time, scientists have discovered that the brain does not fully develop until much later in life than once thought.⁹⁸ According to a report issued by the American Bar Association, "Important changes in adolescent brain anatomy and activity take place far later in development than previously thought, and those findings could impact how policymakers and the highest courts are treating teenagers"⁹⁹

Prior to functional MRIs,¹⁰⁰ it was generally believed that the brain was fully developed by the age of 12.¹⁰¹ Now, with the advancements in

97. Brief for the Am. Med. Ass'n & the Am. Acad. of Children & Adolescent Psychiatry as Amici Curiae Supporting Neither Party, *Miller v. Alabama*, 132 S. Ct. 2455 (2012) (Nos. 10-9646, 10-9647), 2012 WL 121237, at *16 [hereinafter *Miller* Brief].

98. "Only in the past few years, with the advent of magnetic resonance imaging devices ('MRIs'), have neuroscientists been able safely to conduct longitudinal studies on the brains of healthy children as they progress through normal developmental stages." Massie, *supra* note 11, at 659.

99. A.B.A., 31 CHILD L. PRAC. 113, 124 (2012).

100.

This insight emerges from sophisticated and non-invasive brain imaging techniques performed by high-resolution structural and functional magnetic resonance imaging ("MRI") methods. These imaging techniques are a quantum leap beyond previous methods for assessing brain development. Be-

imaging, and specifically functional MRIs, scientists have learned that the brain goes through “a second wave of synapse formation and a spurt of growth in the cerebral cortex, followed by a ‘pruning back’ throughout adolescence.”¹⁰² As a result, scientists have learned that the brain does not fully develop until the late teens or early twenties, and the last part of the brain to develop is the prefrontal cortex, the area of the brain that controls the “executive functions—planning, impulse control and reasoning.”¹⁰³ As a result, there are real differences between an adult’s brain and an adolescent’s brain: “Adolescents are less able to control their impulses; they weigh the risks and rewards of possible conduct differently; and they are less able to envision the future and apprehend the consequences of their actions.”¹⁰⁴ As stated by the American Psychological Association in its *amicus* brief to the Supreme Court, “Even older adolescents who have developed general cognitive capacities similar to those of adults show deficits in these aspects of social and emotional maturity.”¹⁰⁵

These new studies have found their way into the legal system and have greatly altered the way our courts treat adolescents, especially those facing the death penalty or life in prison without the possibility of parole. Interestingly enough, even though the studies are clear in that the brain does not fully develop until one’s early- to mid-twenties, the Supreme Court has continued to draw the line for the harshest penalties *at the age of 18*. As stated by Dr. Giedd, the physician at the forefront of these scientific studies,

[I]t seems almost arbitrary that our society has decided that a young American is ready to drive a car at 16, to vote and serve in the Army at 18 and to drink alcohol at 21. . . . [T]he best estimate for when the brain is mature is 25, the age at which

fore the rise of neuroimaging, the understanding of brain development was gleaned largely from post-mortem examinations. Modern imaging techniques, however, have begun to shed light on how a live brain operates, and how a particular brain develops over time.

Miller Brief, *supra* note 97, at *15-16.

101. Massie, *supra* note 11, at 660 (“Until these studies, most scientists believed that the brain had completed its development by around the age of twelve.”); Wallis, *supra* note 11.

102. Massie, *supra* note 11, at 660.

103. Massie, *supra* note 11, at 661 (footnote omitted) (internal quotation marks omitted).

104. *Miller* Brief, *supra* note 97, at *8 (citing Laurence Steinberg, *Adolescent Development and Juvenile Justice*, 5 ANN. REV. CLINICAL PSYCHOL. 47, 55-56 (2008)).

105. *Miller* Brief, *supra* note 97, at 8.

you can rent a car. Avis must have some pretty sophisticated neuroscientists.¹⁰⁶

With the advent of new imaging, scientists have discovered that after children reach the age of 11 or 12, “there is a second wave of proliferation and pruning that occurs later in childhood . . . affecting . . . [the] ‘highest mental functions.’”¹⁰⁷ During this wave, neural waxing and waning occurs; however, unlike the prenatal changes that occur in the brain, “this neural waxing and waning alters not the number of nerve cells but the number of connections, or synapses, between them.”¹⁰⁸ Thus,

When a child is between the ages of 6 and 12, the neurons grow bushier, each making dozens of connections to other neurons and creating new pathways for nerve signals. The thickening of all this grey matter—the neurons and their branchlike dendrites—peaks when girls are about 11 and boys 12 1/2, at which point a serious round of pruning is under way. Gray matter is thinned out at a rate of 0.7% a year, tapering off in the early 20s. At the same time, the brain’s white matter thickens. The white matter is composed of fatty myelin sheaths that encase axons and, like insulation on a wire, make nerve-signal transmissions faster and more efficient.¹⁰⁹

As a result, this second wave of proliferation verifies that the brain does not fully develop until one’s early twenties.¹¹⁰

These new findings are significant because the part of the brain that is last to develop is the prefrontal cortex, which according to Dr. Giedd, is also the “CEO” or “executive of the brain.”¹¹¹ This is because the frontal lobe “govern[s] impulsivity, judgment, planning for the future, foresight of

106. Wallis, *supra* note 11 (internal quotation marks omitted). Likewise, according to Ruben Gur, MD, PhD and Director at the University of Pennsylvania Medical Center, “The evidence now is strong that the brain does not cease to mature until the early 20s in those relevant parts that govern impulsivity, judgment, planning for the future, foresight of consequences, and other characteristics that make people morally culpable . . .” Ortiz, *supra* note 11.

107. Wallis, *supra* note 11.

108. *Id.*

109. *Id.*

110. Massie, *supra* note 11, at 661 (“Researchers are uncertain as to how long the brain’s maturation process goes on, but they believe that it continues into young adulthood, at least through the early twenties.”).

111. Massie, *supra* note 11, at 661.

consequences, and other characteristics that make people morally culpable”¹¹² Dr. Giedd goes so far as to state that “it’s [the] part of the brain that most separates man from beast.”¹¹³ As a result of this late development in the brain, even though teenagers may seem “physically mature, they may not appreciate the consequences or weigh information the same way adults do. So . . . [although] somebody looks physically mature, their brain may in fact not be mature.”¹¹⁴ Along the same lines, Dr. Laurence Steinberg states

[A]dolescents mature intellectually before they mature socially or emotionally, a fact that helps explain why teenagers who are so smart in some respects do surprisingly dumb things From a neuroscientific standpoint, it therefore makes perfect sense to have a lower age for autonomous medical decision making than for eligibility for capital punishment, because certain brain systems mature earlier than others.¹¹⁵

Because the frontal lobe develops last, youth are more likely than adults to engage in risky behavior, to be impulsive, to not think through their actions and to follow the behavior of others.¹¹⁶ “For example, from adolescence into early childhood, there is a strengthening of activity in brain systems involving self-regulation, and functional MRIs have shown that reward centers in the adolescent brain are activated more than in children or adults”¹¹⁷ This means that “[h]eightedened sensitivity to anticipated rewards motivates adolescents to engage in risky acts, such as unprotected sex, fast driving or drugs when the potential for pleasure is high. This hypersensitivi-

112. Ortiz, *supra* note 11.

113. Massie, *supra* note 11, at 661 (quoting statement of Dr. Jay Giedd).

114. Ortiz, *supra* note 11, at 2.

115. A.B.A., *supra* note 99, at 124(internal quotation marks omitted). See also Andrea MacIver, *Suicide Causation Experts in Teen Wrongful Death Cases: Will They Assist the Trier of Fact?*, 45 J. MARSHALL L. REV. 51 (2011) (suggesting that experts would be necessary to explain the complexities of the development of a youth’s brain in suicide cases).

116.

More generally, the late development of the frontal lobe, responsible for the ‘executive functions,’ may help to account for teenagers’ willingness to indulge in risky behaviors, including experimentation with alcohol and drugs. Research also indicates that young people are more willing to take risks in the presence of friends than when they are alone.

Massie, *supra* note 98, at 662.

117. A.B.A., *supra* note 99, at 124.

ty to reward is particularly pronounced when they're with their friends."¹¹⁸ Similarly, adolescents have a difficult time in exercising self-control and, as a result, adolescents statistically are overrepresented in virtually every category of risky behavior.¹¹⁹

Further, adolescents "lack the experience, perspective, and judgment to recognize and avoid choices that could be detrimental to them."¹²⁰ Adolescents as whole "have less life experience on which to draw, making it less likely that they will fully apprehend the potential negative consequences of their actions."¹²¹ In other words, "children characteristically lack the capacity to exercise mature judgment and possess only an incomplete ability to understand the world around them."¹²² As a result, "adolescents are likely less capable than adults are in *using* these capacities in making real-world choices, partly because of [a] lack of experience and partly because teens are less efficient than adults in processing information."¹²³ As such, the ability to realistically think about the future increases with age and continues to develop through one's early twenties.¹²⁴

Due to adolescents' developmental immaturity, they are also "more susceptible than adults to the negative influences of their environment, and their actions are shaped directly by family and peers in ways that adults' are not."¹²⁵ As such, adolescents are easily influenced by their peers, both directly and indirectly. "In some contexts, adolescents might make choices in response to direct peer pressure, as when they are coerced to take risks that they might otherwise avoid. More indirectly, adolescents' desire for peer approval, and consequent fear of rejection affects their choices even without direct coercion."¹²⁶

118. A.B.A., *supra* note 99, at 124 (quoting Laurence Steinberg, PhD) (internal quotation marks omitted).

119. Emily C. Keller, *Constitutional Sentences for Juveniles Convicted of Felony Murder in the Wake of Rope, Graham, & JDB*, 11 CONN. PUB. INT. L. J. 297, 313 (Spring-Summer 2012).

120. *J.D.B. v. North Carolina*, 131 S. Ct. 2394, 2403 (2011) (quoting *Bellotti v. Baird*, 443 U.S. 622, 635 (1979)) (internal quotation marks omitted).

121. *Miller* Brief, *supra* note 97, at *3-4 (citing Jeffrey Arnett, *Reckless Behavior in Adolescence: A Developmental Perspective*, 12 DEVELOPMENTAL REV. 339, 351-52 (1992)).

122. *J.D.B.*, 131 S. Ct. at 2397.

123. Elizabeth S. Scott & Laurence Steinberg, *Adolescent Development and the Regulation of Youth Crime*, 18 THE FUTURE OF CHILD 15, 20 (2008).

124. See Jari-Erik Nurmi, *How Do Adolescents See Their Future? A Review of the Development of Future Orientation and Planning*, 11 DEVELOPMENTAL REV. 1, 28-29 (1991).

125. *Miller* Brief, *supra* note 97, at *15.

126. Laurence Steinberg, *Adolescent Development and Juvenile Justice*, 5 ANN. REV. CLINICAL PSYCHOL. 459, 469 (2009).

Additionally, “[m]ost juveniles who engage in criminal activity are not destined to become life-long criminals,”¹²⁷ and even youth who commit serious crimes “are likely to outgrow these behaviors.”¹²⁸ Frequently, adolescent criminal conduct is the result of experimentation with risky behavior rather than any deep-rooted moral deficiency.¹²⁹ “Only a small proportion of adolescents who experiment with illegal activities will develop an entrenched pattern of criminal behavior that persists into adulthood; ‘the vast majority of adolescents who engage in criminal or delinquent behavior desist from crime as they mature.’”¹³⁰ However, despite these findings, experts still cannot say with any reliability whether a particular juvenile will outgrow his or her criminal tendencies.¹³¹

Based upon these findings regarding the development of the brain and the conclusions that have been drawn from them, our courts have decided that the cruel and unusual punishment clause of the Eighth Amendment dictates that minors be treated differently than adults when imposing the harshest penalties.¹³² This is because youth do not process or make decisions in the same way as adults, and these differences in the decision-making process are the result of scientific differences in the way the brain develops.

Because of these differences, juvenile offenders are not making the same calculations as adults when they participate in felonies. They are not as likely to be weighing the risks of their involvement, including the risk that someone might get hurt or killed. When confronted with the prospect of short-term rewards—from approval of their peers to any tangible rewards from the felony itself—juveniles

127. Keller, *supra* note 119, at 315 (referencing *Roper*, 543 U.S. at 570).

128. Keller, *supra* note 119, at 315.

129. Terrie Moffitt, *Adolescent-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy*, 100 PSYCHOL. REV. 674, 686 (1993).

130. Miller Brief, *supra* note 97, at *21 (citing Laurence Steinberg & Elizabeth Scott, *Less Guilty by Reason of Adolescence: Developmental Immaturity, Diminished Responsibility, and Juvenile Death Penalty*, 58 AM. PSYCHOLOGIST, 1009, 1014-15 (2003)).

131. See Miller Brief, *supra* note 97, at *21-22.

132. Marsha Levick et al., Article, *The Eighth Amendments Evolves: Defining Cruel and Unusual Punishment Through the Lens of Childhood and Adolescence*, 15 U. PA. J. L. & SOC. CHANGE 285, 299 (2012) (“Youths’ developmental immaturity leads them to function differently than adults in independent functioning, decision-making, emotion regulation, and general cognitive processing. These differences have been observed in behavioral studies as well as studies documenting neurological changes that take place during adolescence and early adulthood. Adolescents’ resulting deficits in certain areas, such as decision-making and impulsivity, along with their heightened vulnerability and the inherently transitory nature of adolescence, suggest that they should be treated differently under the Eighth Amendment.”).

are more likely to prioritize those rewards over any long-term consequences.¹³³

Accordingly, adolescents are more apt to take risks without weighing the consequences and they are more susceptible to negative influences from outside pressure.¹³⁴

B. FUNCTIONAL MRI STUDIES ARISE IN THE LEGAL SYSTEM

For better or for worse, science, and more specifically these studies about the way in which the brain develops, has made its way into the judicial system. As is apparent from the *Roper*, *Graham* and *Miller* opinions, the scientific research submitted to the Court by attorneys and scientific and medical experts through amicus briefs had a profound impact on the outcome of those cases, and more generally, on the meaning of the cruel and unusual punishment clause itself. And, while science was introduced to the Court both in favor of expanding the rights of juveniles as well as limiting the rights of juveniles, in either case, experts are helping to shape policy and legal discussion when it comes to youth and the harshest criminal penalties imposed by courts.¹³⁵

In *Roper*, the American Medical Association (AMA) submitted an amicus brief.¹³⁶ Within that brief, the AMA stated that “[t]o a degree never before understood, scientists can now demonstrate that adolescents are immature not only to the observer’s naked eye, but in the very fibers of their brains.”¹³⁷ The AMA further reported:

Adolescent brains are not fully developed in regions related to reasoning, risk taking, and impulse control. Even more groundbreaking than the evidence of brain activity is the recent reevaluation, confirmed through brain imaging studies, that the brain’s frontal lobes are still structurally immature well into late adolescence. The prefrontal cortex (which . . . is most associated with impulse control,

133. Keller, *supra* note 119, at 315.

134. Keller, *supra* note 119, at 313-15.

135. American Bar Association, 31 No. 9 CHILD L. PRAC. 124 (Sept. 2012) (quoting Laurence Steinberg, PhD).

136. The American Medical Association was just one of many parties to file amicus briefs in *Roper*.

137. Brief for the Am. Med. Ass’n et al. as Amici Curiae in Support of Respondent at 10, *Roper v. Simmons*, 543 U.S. 551 (2005) (No. 03-633), 2004 WL 1633549, at *10 [hereinafter *Roper* Brief].

risk assessment, and moral reasoning) is “one of the last brain regions to mature.”¹³⁸

The AMA concludes that such studies have shown that “the regions of the brain associated with impulse control, risk assessment, and moral reasoning develop last, after late adolescence.”¹³⁹

In *Graham*, the Court received a brief from the American Psychiatric Association (APA), which emphasized the new brain studies and the impact they should have on sentencing minors. “[R]ecent neuroscience research shows that adolescent brains are not yet fully developed in regions related to higher-order functions such as impulse control, planning ahead, and risk evaluation.”¹⁴⁰ The APA recognized that “[s]cience cannot, of course, draw bright lines precisely demarcating the boundaries between childhood, adolescence and adulthood,”¹⁴¹ however it noted that “qualities that distinguish juveniles from adults do not disappear when an individual turns 18.”¹⁴² An adolescent can only learn through his or her experiences and such a “process will probably not be completed until very late in the teen years [E]xpecting the experienced-based ability to resist impulses to be fully formed prior to age eighteen or nineteen would seem on present evidence to be wishful thinking.”¹⁴³ Further, the APA reported to the Court that “[e]mpirical research confirms that adolescents—even old adolescents—have not fully developed these abilities and hence lack an adult’s capacity for mature judgment.”¹⁴⁴ “[M]ost identity development takes place during the late teens and early twenties”¹⁴⁵ and as a result “[c]oherent integration of identity does not occur until late adolescence or early adulthood; the final stages of this process often occur in the college years.”¹⁴⁶

138. *Roper* Brief, *supra* note 137, at 16 (emphasis omitted) (footnotes omitted).

139. *Roper* Brief, *supra* note 137, at 11.

140. Brief for the Am. Psychological Ass’n et al. as Amici Curiae Supporting Petitioners at 4, *Graham v. Florida*, 560 U.S. 48 (2010) (Nos. 08-7412, 08-7621), 2009 WL 2247126, at *4 [hereinafter *Graham* Brief].

141. *Graham* Brief, *supra* note 140, at 6 n.3.

142. *Graham* Brief, *supra* note 140, at 6 n.3 (citing *Roper*, 543 U.S. at 574) (internal quotation marks omitted).

143. *Graham* Brief, *supra* note 140, at 10 (quoting Franklin E. Zimring, *Penal Proportionality for the Young Offenders*, in *Youth on Trial* 271, 280 (Thomas Grisso & Robert G. Schwartz eds., 2000)).

144. *Graham* Brief, *supra* note 140, at 13.

145. *Graham* Brief, *supra* note 140, at 19 n.39 (quoting Laurence Steinberg & Robert G. Schwartz, *Developmental Psychology Goes to Court*, in *Youth on Trial: A Developmental Perspective on Juvenile Justice* 9, 27 (Thomas Grisso & Robert G. Schwartz eds., 2000) (internal quotation marks omitted) (parentheses omitted)).

146. *Graham* Brief, *supra* note 140, at 19 n.39 (providing parenthetical information to Elizabeth Scott & Laurence Steinberg, *Rethinking Juvenile Justice* 38 (2008)).

And, by the time *Miller* was decided in 2012, amicus briefs again inundated the Court. These briefs, however, relied heavily on research and studies already cited before the Court in *Roper* and *Graham*, and merely emphasized that over time, the science backing such research has only grown stronger. According to the American Psychological Association, American Psychiatric Association, and National Association of Social Workers,

an ever-growing body of research in developmental psychology and neuroscience continues to confirm and strengthen the Court's conclusions[:] Compared to adults, juveniles are less able to restrain their impulses and exercise self-control; less capable of considering alternative courses of action and avoiding unduly risky behaviors; and less oriented to the future and thus less attentive to the consequences of their often-impulsive actions. Research also continues to demonstrate that 'juveniles are more vulnerable or susceptible to negative influences and outside pressures, including peer pressure,' while at the same time they lack the freedom and autonomy that adults possess to escape such pressures.¹⁴⁷

As such, this "research continues to confirm and expand upon the fundamental insight underlying this Court's previous decisions[:] Juveniles' profound differences from adults undermine the possible penological justifications for punishing a juvenile offender with a sentence that 'guarantees he will die in prison without any meaningful opportunity to obtain release.'"¹⁴⁸ "By now, '[t]here is incontrovertible evidence of significant changes in the brain structure and function during adolescence,' and '[a]lthough most of this work has appeared just in the last 10 years, there is already strong consensus among developmental neuroscientists about the nature of' these changes."¹⁴⁹ Similarly, as stated in the brief of the American Medical Association and the American Academy of Child and Adolescent Psychiatry,

147. *Miller* Brief, *supra* note 97, at *3-4 (quoting *Roper*, 543 U.S. at 569).

148. *Miller* Brief, *supra* note 97, at *5.

149. *Miller* Brief, *supra* note 97, at *3-4 (quoting Laurence Steinberg, *Should the Science of Adolescent Brain Development Inform Public Policy?*, 64 AM. PSYCHOLOGIST 739, 742 (2009)).

[E]ach time this Court has examined the constitutional limitations of imposing severe penalties on juvenile offenders, the scientific research on the development of the adolescent brain has grown. This research establishes that the brain systems that are crucial for exerting cognitive control over behavior and processing rewards are still immature during adolescence.¹⁵⁰

And, in a brief authored by numerous former juvenile court judges, the authors point out the studies relied on in the Court's rulings in both *Roper* and *Graham* and emphasize that "the seriousness of the offense simply does not change the fundamental characteristics of the [juvenile] offender."¹⁵¹

As is obvious from the opinions issued in *Roper*, *Graham* and *Miller*, the Supreme Court judges, who are not scientists, medical doctors, or psychiatric experts, relied very heavily on the scientific research submitted by the outside community in making drastic changes in juvenile sentencing—from a time when a child over the age of seven could be sentenced to death, to 2013, when the Supreme Court had categorically prohibited any offender under the age of eighteen from receiving the death penalty, life without the possibility of parole for nonhomicide crimes, and automatic life without the possibility of parole for homicide crimes.¹⁵² These are drastic changes in the sentencing of juveniles that simply would not have been possible without the scientific research to support them.

C. WHAT DOES ALL THIS MEAN FOR YOUTH, LIKE NINETEEN-YEAR-OLD DZHOKHAR TSARNAEV, WHO FALLS INTO THE "GREY AREA"?

Miller almost certainly will not be the Supreme Court's final word on the cruel and unusual punishment clause's impact on juvenile offenders, especially since there remains a disconnect between science and the law as it stands. As pointed out above, while the courts have continued to draw the line for the harshest criminal penalties at the age of eighteen, science would suggest that the line be drawn somewhere around the early-to-mid twenties. So what happens to these nineteen, twenty and twenty-something year olds

150. *Miller* Brief, *supra* note 97, at *36 (footnote omitted) (internal quotation marks omitted).

151. Brief of Former Juvenile Court Judges as Amici Curiae in Support of Petitioners at 7-8, *Miller v. Alabama*, 132 S. Ct. 2455 (2012) (Nos. 10-9646, 10-9647), 2012 WL 135044, at *7-8.

152. See *Roper v. Simmons*, 543 U.S. 551, 560 (2005); *Graham v. Florida*, 560 U.S. 48 (2010); *Miller v. Alabama*, 132 S. Ct. 2455 (2012).

who fall into this “grey area”¹⁵³ between where the law draws the line and where science draws the line? We have already seen juveniles push the limits of the rulings the Supreme Court handed down in *Roper*, *Graham*, and *Miller* by challenging sentences that are extremely lengthy, but fall short of death or life without the possibility of parole,¹⁵⁴ and successfully challenging sentences that are not labeled “life without the possibility of parole,” but function as the equivalent of life without the possibility of parole.¹⁵⁵

Without question, lawyers will point out to the courts (and ultimately the Supreme Court of the United States) the fact that juveniles under the age of 18 are being spared of the harshest criminal penalties even though the scientific studies relied upon in *Roper*, *Graham*, and *Miller* would suggest nineteen, twenty and even youth in their early- to mid-twenties be spared of those harshest criminal penalties too. There is no doubt that such challenges will be made by youths who fall into this grey area. However, whether those challenges will be successful is a question that is less certain in light of the factual circumstances surrounding each case (sometimes very horrific), the inherent nature of science (always evolving), and the Court’s desire to draw lines (here, to draw the line for the harshest criminal penalties at 18 years old).¹⁵⁶ And, although experts and scientists are confident in the scientific research regarding the brain’s development as it stands now,¹⁵⁷ who is to say there won’t be new developments in the future? And,

153. The “grey area” refers to nineteen year old, twenty year old and early-to-mid twenty year old youth offenders who the law recognizes as being eligible for the harshest criminal penalties even though science suggests they should not be eligible for such criminal penalties.

154. See *People v. Perez*, 154 Cal. Rptr. 3d 114 (Cal. 4th Dist. Ct. App. 2013), as modified on denial of reh’g (Mar. 4, 2013), review filed (Apr. 4, 2013), *cert. denied*, 134 S. Ct. 527 (2013) (defendant unsuccessfully argues that his 30 years to life sentence for offenses committed at age 16, including two counts of forcible lewd act upon child under the age of 14, violated the cruel and unusual punishment clause); *People v. Rocha*, No. 11CF0470, 2013 WL 4774758 (Cal. 4th Dist. Ct. App. Sept. 6, 2013) (juvenile defendant unsuccessfully challenged his sentence of forty years to life in prison).

155. See *People v. Kidd*, Nos. C062075, C062512, 2012 WL 243250, at *20-23 (Cal. Ct. App. Jan. 26, 2013) (unconstitutional for the court to sentence a fifteen year old to a 90.5 year sentence and a seventeen year old a eighty-five year sentence before becoming eligible for parole). *But see* *People v. Caballero*, 119 Cal. Rptr. 3rd 920, 925-27 (Cal. Ct. App. 2011) (court upheld a 110-year life sentences and explicitly rejected the idea that *Graham* should apply to virtual life cases).

156. In *Gladden v. Kerestes*, defendant, who was convicted of murder, argued that even though he was over the age of eighteen at the time he committed the murder, the ruling in *Miller* should be applied to those who are between the ages of eighteen and twenty-five, which he was. *Gladden v. Kerestes*, No. 13-3617, 2013 WL 6846939, at *3-4 (E.D. Penn. Dec. 27, 2013). The court found that defendant was “seeking to apply a new rule, which has not been recognized by the Supreme Court” and therefore, defendant’s claim “lack[ed] potential merit.” *Id.*

157. See *supra* notes 97-134 and accompanying text.

even with fool proof science, will the courts be willing to part with the now-engrained principle of drawing the line at eighteen?¹⁵⁸

Further complicating this clash between science and the law¹⁵⁹ is the fact that science cannot give us an exact answer—experts cannot definitively say “whether or not a child’s actions are characteristics that ‘reflec[t] unfortunate yet transient immaturity or rare irreparable corruption.’”¹⁶⁰ In other words, when a youth commits a crime, it is impossible to know whether that crime is the result of true criminal behavior that will continue in the future or the result of an immature youth who will grow out of such behavior. Nevertheless, while this complicating factor applies to youth that fall into the grey area, it applies equally to youth under the age of eighteen, too,¹⁶¹ and our courts have acknowledged that drawing the line at eighteen might be over inclusive and might save that lives of some who do not deserve to be saved.¹⁶²

158. Prior to *Roper*, which was decided in 2005, the Court had drawn the line at the age of 16. See *Thompson v. Oklahoma*, 487 U.S. 815 (1988) (showing that the Court is willing to redraw the line when faced with the right circumstances.).

159. See David Goodstein, *How Science Works*, in *Reference Manual on Scientific Evidence* 67, 80-82 (Federal Judicial Center ed., 2d ed. 2000) (examining fundamental differences in science and law). (“[S]cience and the law differ fundamentally in their objectives. The objective of the law is justice; that of science is truth. These are not at all the same thing. Justice, of course, also seeks truth, but it requires that a clear decision be made in a reasonable and limited amount of time. . . . Both disciplines seek, in structured debate, using empirical evidence, to arrive at rational conclusions that transcend the prejudices and self-interest of individuals.”); David L. Faigman, *The Law’s Scientific Revolution: Reflections and Ruminations on the Law’s Use of Experts in Year Seven of the Revolution*, 57 WASH. & LEE L. REV. 661, 679 (2000) (“Science and the law play by wholly different sets of rules. Yet, they play on the same fields, and therefore they have to decide by which set of rules they will abide. The law is, at bottom, a normative institution. It is also practical and pragmatic, but its success is measured by values and morals. The law is a consumer of information with the purpose of producing fair, just, equitable, and efficient outcomes. Psychology is a producer of information. It ought to transcend practical politics, seeking information that transcends legal contexts and, if possible, social contexts.”).

160. Gerard Glynn & Ilona Vila, *What States Should Do to Provide a Meaningful Opportunity for Review and Release: Recognize Human Worth and Potential*, 24 ST. THOMAS L. REV. 310, 312 (2012) (alteration in original) (quoting *Graham v. Florida*, 560 U.S. 48, 67 (2010); (quoting *Roper v. Simmons*, 543 U.S. 551, 573 (2005))); *Roper*, 543 U.S. at 573 (2005) (“It is difficult even for expert psychologists to differentiate between the juvenile offender whose crime reflects unfortunate yet transient immaturity, and the rare juvenile offender whose crime reflects irreparable corruption.”).

161. Craig S. Lerner, *Sentenced to Confusion: Miller v. Alabama and the Coming Wave of Eighth Amendment Cases*, 20 GEO. MASON L. REV. 25, 26 (2012) (“*Graham* suffers from the faulty premises that juveniles who commit heinous crimes are typical juveniles, and that they are categorically less culpable than young adult offenders.”).

162. This means that some sixteen and seventeen year old who consciously commit crimes as part of an irreparable criminal trait will escape receiving the harshest criminal penalties.

In the case of the Dzhokhar Tsarnaev, experts and scientists will not be able to definitively say whether his actions leading up to, after, and on Patriot's Day were the result of an undeveloped brain vulnerable to negative influences, or whether those actions were conscious decisions that were part of irreparable criminal tendencies, or both. What experts and scientists will be able to definitively say, though, is that as a nineteen year old, Dzhokhar Tsarnaev's brain had not yet fully developed.¹⁶³ In the past, as is evident from *Roper*, *Graham*, and *Miller*, this fact—that the brain was not fully developed—was sufficient to spare juvenile offenders under the age of 18 of the harshest criminal penalties, regardless of the crime committed.¹⁶⁴ As stated by the court in *Roper*, “The differences between juvenile and adult offenders are too marked and well understood to risk allowing a youthful person to receive the death penalty despite insufficient culpability.”¹⁶⁵ However, given that we know that these scientific studies show that the brain is not fully developed until one's early- to mid-twenties, it would not defy logic if they were not considered when sentencing those who are directly implicated by them, *i.e.* those who fall in the grey area? And, *yes*, that would include Dzhokhar Tsarnaev.¹⁶⁶

From what we know about Dzhokhar Tsarnaev, it appears that Dzhokhar Tsarnaev exhibited many of the characteristics (discussed above) typically found in a youth with a brain that is not yet fully developed. First, and most obvious, he falls into the grey area—at nineteen years old, he does not categorically fall into the class of juvenile offenders under the age of eighteen who cannot receive the death penalty or automatic life without the possibility of parole, but he does fall into the class of youth that science recognizes as having brains that are not yet fully developed. Second, while Dzhokhar Tsarnaev's crime appeared to be very well-planned and thought

163. See *supra* notes 97-134 and accompanying text.

164. *Miller v. Alabama*, 132 S. Ct. 2455, 2487 (2012) (As stated by Justice Alito in his dissenting opinion in *Miller*, “Even a 17½-year-old who sets off a bomb in a crowded mall or guns down a dozen students and teachers is a ‘child’ and must be given a chance to persuade a judge to permit his release into society. Nothing in the Constitution supports this arrogation of legislative authority.”).

165. *Roper v. Simmons*, 543 U.S. 551, 572-73 (2005).

166. The example of Dzhokhar Tsarnaev is used in this Article to show just how powerful the clash between science and the law can be, and is in the case of youth offenders facing the death penalty or life without the possibility of parole. This Article takes the reader through all the scientific studies, which clearly demonstrate how and why a youth's brain is not fully developed until one's early- to mid-twenties, and then shows how the Supreme Court of the United States accepted and truly relied on these studies in its holdings in *Roper*, *Graham*, and *Miller* (in effect legitimizing the studies in a legal setting). The Article attempts to get the reader to buy into the scientific studies, which they should. But then, after the discussion of the scientific studies and the Court's application of those studies is over, the Article asks the reader to apply them to Dzhokhar Tsarnaev, the nineteen-year-old who set off home-made bombs on the crowded streets of Boston during the 2013 Boston Marathon.

out,¹⁶⁷ numerous reports have indicated that Dzhokhar Tsarnaev may have been heavily influenced by his older brother, especially with respect to the plotting and planning of the marathon bombing.¹⁶⁸ Further, in the time leading up to the Boston Marathon, Dzhokhar Tsarnaev was increasingly engaging in risky behaviors: drinking alcohol, doing drugs and selling marijuana, an activity that often brought in one thousand dollars in cash or more per week.¹⁶⁹ He was also extremely vulnerable to peer pressure, especially from his brother,¹⁷⁰ someone who was believed to have been plagued by “inner voices,” who thought someone was trying to control him and “make him do something,” and who was increasingly engaging in extremist Islam practices.¹⁷¹ And Dzhokhar Tsarnaev came from a family where run-ins with the law were all too common.¹⁷² From what is currently known, Dzhokhar Tsarnaev fits the profile of a teenager whose brain was not yet fully developed and who was in an environment where he could easily be swayed by negative peer pressures. In these ways, Dzhokhar Tsarnaev fits the profile of a youth who the Supreme Court previously found should be protected from being sentenced to the harshest criminal penalties.¹⁷³ However, because Dzhokhar Tsarnaev was nineteen years old at the time he committed his crimes, he remains eligible for, and has been charged with, the death penalty, regardless of what the scientific studies say.

167. Just prior to being captured by the police, Dzhokhar Tsarnaev wrote the following messages in the boat where he was found: “The U.S. Government is killing our innocent civilians. I can’t stand to see such evil unpunished. We Muslims are one body, you hurt one you hurt us all. Now I don’t like killing innocent people[,] it is forbidden in Islam[;] but due to said (unintelligible)[,] it is allowed.” Feyerick, *supra* note 6 (quoting Tsarnaev) (internal quotation marks omitted).

168. See Drash, *supra* note 5 (“At 26, Tamerlan was seven years older than his brother Dzhokhar, who followed his big brother around like a puppy.”); see also Feyerick, *supra* note 6 (“Tsarnaev’s lawyers could argue that he was under the ‘mesmerizing influence’ of Tamerlan, his older brother.”); Janet Reitman, *Jahar’s World*, ROLLING STONE (July 17, 2013), <http://www.rollingstone.com/culture/news/jahars-world-20130717> (“Jahar [Dzhokhar Tsarnaev] idolized his older brother, Tamerlan - all the children appeared to - and as a child, he followed his brother’s example and learned to box. . . . ‘His brother must have brainwashed him,’ says Sam [a friend of Tsarnaev]. ‘It’s the only explanation.’”).

169. Josie Jammet, *The Fall of the House of Tsarnaev*, B. GLOBE (Dec. 15, 2013) <http://www.bostonglobe.com/Page/Boston/2011-2020/WebGraphics/Metro/BostonGlobe.com/2013/12/15tsarnaev/tsarnaev.html>.

170. See Drash *supra* note 5 (Tsarnaev was said to follow his older brother “like a puppy.”)

171. See Jammet, *supra* note 169 (quoting Don Larking, a friend of Tamerlan) It has been speculated that Tamerlan likely suffered from some form of schizophrenia because of the voices he claimed to be hearing, smoking marijuana, and the head trauma he had suffered throughout his years of boxing. *Id.*

172. See Jammet, *supra* note 169.

173. See *Roper v. Simmons*, 543 U.S. 551, 560 (2005); *Graham v. Florida*, 560 U.S. 48 (2010); *Miller v. Alabama*, 132 S. Ct. 2455 (2012).

If the scientific studies regarding the development of the brain were considered in the case of Dzhokhar Tsarnaev, who faces the death penalty if convicted,¹⁷⁴ it is possible that the court could rule that it is unconstitutional to sentence him with the death penalty or automatic life without the possibility of parole. In a real sense, science could save Dzhokhar Tsarnaev's life. And, based on the Court's rulings in *Roper*, *Graham*, and *Miller*, science *should* save Dzhokhar Tsarnaev's life. First, experts and scientists have concluded that the brain is not fully developed until one's early- to mid-twenties. As a result, at nineteen years old, science tells us that Dzhokhar Tsarnaev's brain was not fully developed when he committed his crimes.¹⁷⁵ Second, the Supreme Court of the United States has relied on the scientific studies that tell us the brain is not fully developed until one's early- to mid-twenties to hold that it is cruel and unusual to punish youth under the age of eighteen to death or automatic life without the possibility of parole.¹⁷⁶ Thus, the Supreme Court had already validated these scientific studies and even used them in support of its rulings save juveniles under the age of eighteen from the harshest criminal penalties. Accordingly, it does not make much sense for the courts not to consider these scientific studies when sentencing Dzhokhar Tsarnaev—not only do the studies apply to him, but the Supreme Court has relied on the studies before. Given Dzhokhar Tsarnaev's horrific actions, it is difficult to say that he is not deserving of the harshest criminal penalty allowed by our legal system, but if our judicial system truly buys into the scientific studies about the development of the brain, and the Supreme Court of the United States appeared to buy into these studies in *Roper*, *Graham*, and *Miller*, our legal precedent on the cruel and unusual punishment clause demands that the death penalty be taken off the table for Dzhokhar Tsarnaev.

Here is where the concerns of the dissenting opinions in *Roper*, *Graham*, and *Miller* come to life. Justice Alito, in his dissenting opinion in *Miller*, disagreed with the majority opinion because it made it possible for “even a 17¹/₂-year-old who sets off a bomb in a crowded mall or guns down a dozen students and teachers . . . to persuade a judge to permit his release into society.”¹⁷⁷ Accordingly, Justice Alito points out that there are some crimes that are just too heinous to warrant protection from the harshest criminal penalties, *regardless of the offender's age*. And in the case of Dzhokhar Tsarnaev, given the crimes he has committed, the death penalty

174. Catherine E. Shoichet, *For Boston bombing victims, death penalty decision a 'step forward'*, CNN.COM (January 31, 2014, 10:41 PM), http://www.cnn.com/2014/01/30/justice/tsarnaev-death-penalty/index.html?hpt=ju_c2.

175. See *supra* notes 97-134 and accompanying text.

176. See *Roper*, 543 U.S. at 560; *Graham*, 560 U.S. at 48; *Miller*, 132 S. Ct. at 2455.

177. *Miller*, 132 S. Ct. at 2487.

will remain fair game,¹⁷⁸ *even if science says it should not.*¹⁷⁹ Dzhokhar Tsarnaev's crimes were too heinous, in the eyes of most, more heinous than the crimes committed by the youth in *Roper*, *Graham*, and *Miller* combined. As a result, when the Attorney General announced his decision to seek the death penalty for Dzhokhar Tsarnaev's crimes, he stated: "The nature of the conduct at issue and the resultant harm compel this decision [to seek the death penalty]."¹⁸⁰ And while the Supreme Court in *Roper*, *Graham*, and *Miller* made it clear that their rulings applied *regardless of the crime committed*, this is a case where the Court cannot overlook the nature of the crime.¹⁸¹ In this case, the law, and the line that has been drawn at eighteen for over a decade, has the support of emotion (or what the Supreme Court has referred to as the "objective indicia of society's standards"),¹⁸² and for that reason science will not save Dzhokhar Tsarnaev's

178. Sebastian Murdock, *Dzhokhar Tsarnaev, Boston Bombing Suspect, Has Life or Death Resting in Attorney General*, THE HUFFINGTON POST (December 1, 2013) http://www.huffingtonpost.com/2013/12/01/boston-bombing-death-penalty_n_4367908.html ("If you put a bomb down in a crowd, it becomes one of those cases where you say, 'If not now, when do you ever certify a case as a death penalty case?'").

179. See *supra* notes 97-134 and accompanying text. Joshua Greene, a philosopher at Harvard University, believes that "neuroscience will challenge and 'reshape our intuitive sense of justice.'" Adam B. Shniderman, *The Devil's Advocate: Using Neuroscientific Evidence in International Criminal Trials?*, 38 BROOK J. INT'L L. 655, 655 (2013) (quoting Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Nothing and Everything*, 359 PHIL. TRANS. R. SOC. LOND. B. 1775, 1775 (2004)).

180. See Shoichet, *supra* note 174. See also Tsarnaev Indictment, *supra* note 1. In a December 1, 2013 article, the Huffington Post reported that while seventy percent of those people interviewed by the Huffington Post were in favor of seeking the death penalty against Dzhokhar Tsarnaev, only thirty-three percent of Boston Globe readers were in favor of the death penalty, and a Massachusetts jury will ultimately decide the issue. See Murdock, *supra* note 178. It will be up to the Attorney General to decide whether to seek the death penalty. ("It's one thing for the government to be willing to impose the death penalty; it will be a lot harder to find people in Massachusetts to serve on a jury who would vote for the death penalty," said Andrew Smith, director of the University of New Hampshire Survey Center. "It's not terribly surprising given that it is Massachusetts." Holder will also have to consider Tsarnaev's youth, and whether or not his older brother may have intimidated him into taking part in the bombings, Richard Dieter, executive director of the Death Penalty Information Center, told USA Today.") *Id.*

181. As correctly noted by Adam B. Shniderman, there would need to be a willingness on the part of the courts to accept the scientific studies before any change can occur. Shniderman, *supra* note 179. ("Even when science can shed light on issues, how far will the law go in response to science?").

182. *Roper v. Simmons*, 543 U.S. 551, 552 (2005). What is referred to as emotion in this Article, could easily equate in many ways to the "national consensus" or the "objective indicia of society's standards" as referred to by the Supreme Court in *Roper*, *Graham* and *Miller*. In *Roper* and *Graham*, the Supreme Court relied heavily on a national consensus and the objective indicia of society. *Roper*, 543 U.S. at 567 ("The objective indicia of consensus in this case—the rejection of the juvenile death penalty in the majority of States; the infrequency of its use even where it remains on the books; and the consistency in the trend to-

life.¹⁸³ Dzhokhar Tsarnaev set off a bomb in the middle of an area crowded with innocent men, women, and children—if the death penalty is not warranted here, when would it ever be warranted? But, maybe the Supreme Court will shock us and hold true to the scientific studies that it relied upon so heavily in *Roper*, *Graham*, and *Miller*—after all, it does appear that the Court was beginning to stray from the “objective indicia of society’s standards” principle in *Miller*.¹⁸⁴ But, given the horrific nature of this case and the crimes committed by Dzhokhar Tsarnaev, that seems unlikely.

That is not to say that science will not win down the road. It seems inevitable that there will be a case where a nineteen-year-old commits a different, less-heinous crime where the line at eighteen has a better chance of being effectively redrawn.¹⁸⁵ After all, science tells us that the line must be

ward abolition of the practice—provide sufficient evidence that today our society views juveniles”); *Graham v. Florida*, 560 U.S. 48, 67 (2010) (“The sentencing practice now under consideration is exceedingly rare[] [a]nd ‘it is fair to say that a national consensus has developed against it.’”). However, interestingly, in *Miller*, the Supreme Court seems to stray away from the “objective indicia of society’s standards” analysis. *Miller v. Alabama*, 132 S. Ct. 2455, 2480 (2012) (“In the end, the Court does not actually conclude that mandatory life sentences for juvenile murderers are unusual. It instead claims that precedent ‘leads to’ today’s decision, primarily relying on *Graham* and *Roper*”). This suggests that the Court in *Miller* was allowing science to prevail.

183. See *Roper*, 543 U.S. at 568 (quoting *Atkins v. Virginia*, 536 U.S. 304, 319 (2002)) (“Capital punishment must be limited to those offenders who commit ‘a narrow category of the most serious crimes’ and whose extreme culpability makes them ‘the most deserving of execution.’”).

184. *Miller*, 132 S. Ct. at 2477, 2480 (internal quotation marks omitted).

185. See *Roper*, 543 U.S. at 574 (“Drawing the line at 18 years of age is subject, of course, to the objections always raised against categorical rules. The qualities that distinguish juveniles from adults do not disappear when an individual turns 18. By the same token, some under 18 have already attained a level of maturity some adults will never reach. For the reasons we have discussed, however, a line must be drawn.”); Shniderman, *supra* note 179.

In all legal systems, society is forced to draw lines that hold some individuals responsible, but not others. Even among those that can be held criminally responsible, there are further categorical divisions. For example, the United State Supreme Court has distinguished several classes of people for whom the available punishments are limited, i.e., prohibiting execution of minors and mentally retarded, based on assumptions about the agency and capacity of the actor. Implicitly, there lines are drawn on concepts of morality and justice, sometimes rooted in scientific knowledge about human behavior. Certainly, the bright line distinctions that society and law create do not perfectly fit the real world. Is a person with an IQ of 71 so radically different than a person with an IQ of 69, such that the former is eligible to be executed while the latter is not? Is the brain of a nineteen-year-old so significantly different from a

redrawn.¹⁸⁶ However, until that case makes its way to the Supreme Court, those nineteen, twenty, and twenty-something year-olds will remain caught in the grey area, where the difference between life and death is potentially only one Supreme Court decision away.

IV. CONCLUSION

“The United States Supreme Court has established that juveniles are different than adults in constitutionally relevant ways, including for the purposes of the Eighth Amendment assessment of cruel and unusual punishment.”¹⁸⁷ This established principle—that juveniles are different than adults—is largely based upon scientific studies that show the brain is not fully developed until one’s early- to mid-twenties.¹⁸⁸ In light of such findings, we must ask if it still makes sense to draw the line at the age of eighteen when it comes to the most severe criminal punishments, including the death penalty. In the case of Dzhokhar Tsarnaev, prosecutors are seeking the death penalty for the nineteen-year-old who set off a bomb in a crowded area of innocent civilians. He is nineteen after all, and the law, as it stands, allows for that. However, as a nineteen-year-old, Dzhokhar falls into the grey area—the area where science recognizes that his brain is not fully developed, but where the law punishes him as an adult regardless. There is no doubt that someone who takes the lives of innocent people deserves the strongest penalty allowed by law. However, our legal system has held that it is cruel and unusual to sentence persons under the age of eighteen to death

seventeen-year-old that the former should be eligible for execution, while the latter should not?

Id. (footnotes omitted).

Also, interestingly, the Supreme Court made the following statements in *Miller*:

Our Eighth Amendment cases have also said that we should take guidance from ‘evolving standards of decency that mark the progress of a maturing society.’ Mercy toward the guilty can be a form of decency, and a maturing society may abandon harsh punishments that it comes to view as unnecessary or unjust. But decency is not the same as leniency. A decent society protects the innocent from violence. A mature society may determine that this requires removing those guilty of the most heinous murders from its midst, both as protection for its other members and as a concrete expression of its standards of decency. As judges we have no basis for deciding that progress toward greater decency can move only in the direction of easing sanctions on the guilty.

Miller, 132 S. Ct. at 2478 (citations omitted).

186. See *supra* notes 97-134 and accompanying text.

187. Keller, *supra* note 119.

188. See *supra* notes 97-134 and accompanying text.

or automatic life without the possibility of parole *regardless of the crime they have committed* based on scientific studies that indicate they are less mature and less suitable for receiving such serious punishments.¹⁸⁹ And, those scientific studies that were used to spare youth under the age of eighteen from the harshest criminal penalties apply equally to youth between the ages of eighteen and their early- to mid-twenties, which includes Dzhokhar Tsarnaev. Due to the severity of his crimes, however, the Supreme Court and society will not be ready to unilaterally take the death penalty off the table for Dzhokhar Tsarnaev. This is where the clash between science and the law rears its head—science may suggest that nineteen-year-old Dzhokhar Tsarnaev should not be eligible to receive the death penalty (or automatic life without the possibility of parole), but because the law draws that line at eighteen, he is eligible for whatever sentence he receives, including death. Inevitably, the Supreme Court will have to address this disconnect between its legal rulings and science.¹⁹⁰ However, until then, the line will remain at eighteen, where it is of no help to Dzhokhar Tsarnaev or any other offenders who fall into the grey area.

189. See *supra* notes 97-134 and accompanying text.

190. “As technology evolves and advances, science and law will become more deeply entwined.” Justice Ming W. Chin et al., *Introduction*, FORENSIC DNA EVIDENCE: SCIENCE AND THE LAW § 13:1 (April 2013); see also Michael C. Mason, *The Scientific Evidence Problem: A Philosophical Approach*, 33 ARIZ. ST. L.J. 887, 900 (2001) (“Scientific evidence is valuable because of its potential to help judges and juries find truth.”); David L. Faigman, *The Law’s Scientific Revolution: Reflections and Ruminations on the Law’s Use of Experts in Year Seven of the Revolution*, 57 WASH. & LEE L. REV. 661, 681 (2000) (“Science and the law are two wholly different institutions, with very different histories, different methodologies, different standards for success, and different objectives. In our world they are both indispensable, but not reconcilable. We should not wish them to be. In some ways, they are like the branches of the federal government, which were created, in part, to check the excesses and jealousies of one another. They share power, but they also check one another’s power.”).