

JUVENILE JUSTICE, *SULLIVAN*, AND *GRAHAM*: HOW THE SUPREME COURT'S DECISION WILL CHANGE THE NEUROSCIENCE DEBATE

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ABSTRACT

Over the past twenty years, neuroscientists have discovered that brain maturation continues through an individual's mid-twenties. The United States Supreme Court cited this research to support its abolition of the juvenile death penalty in Roper v. Simmons. Now the Court is faced with two cases that challenge the constitutionality of sentencing juveniles to life imprisonment without parole. Many believe these studies indicate that juveniles are both less culpable for their actions and more likely to reform; therefore, life in prison for juveniles is disproportionate, cruel, and unusual. However, others caution against the use of these studies in deciding issues of juvenile justice. This iBrief summarizes the cases currently before the Court, presents the arguments for and against the use of neuroscience in the juvenile justice debate, and analyzes the impact these cases will have on the future of neuroscience's role in juvenile justice.

INTRODUCTION

¶1 Advances in technology since the early 1990s have transformed the way neuroscientists study the juvenile brain.² In the past, scientists studied the brain through post-mortem examinations,³ animal studies, and computational models.⁴ Through the relatively new technologies of magnetic resonance imaging (MRI) and functional magnetic resonance imaging (fMRI), scientists can study the development of the brain over time in a noninvasive manner.⁵ Studies using these imaging technologies have revealed that the juvenile brain, once thought to be fully developed in early adolescence, continues to develop in key regions through the teenage years

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² See O. Carter Snead, *Neuroimaging and the "Complexity" of Capital Punishment*, 82 N.Y.U. L. REV. 1265, 1273 (2007).

³ William J. Katt, *Roper and the Scientific Amicus*, 49 JURIMETRICS J. 253, 263 (2009).

⁴ Snead, *supra* note 2, at 1273.

⁵ *Id.* at 1273–82.

and into the early to mid-twenties.⁶ In particular, the prefrontal cortex of the frontal lobe—responsible for executive functions such as impulse control, reasoning, and judgment—continues to develop through adolescence.⁷ Criminal defense attorneys have begun using this research to argue for lesser sentences for juveniles as compared to adults; such efforts led to the abolition of the death penalty for juveniles in 2005.⁸

I. *ROPER V. SIMMONS, SULLIVAN V. FLORIDA AND GRAHAM V. FLORIDA*

¶2 Writing for the majority in *Roper v. Simmons*, Justice Stevens used neuroimaging research of juvenile brain development to help support the holding that applying the death penalty to juveniles is unconstitutional under the Eighth Amendment.⁹ Justice Stevens found juveniles to be less culpable than adults for the same crimes because juveniles' personalities are still developing, and thus, there is a greater possibility that character deficiencies will be reformed.¹⁰ The Court held that juveniles' diminished culpability weakens the force behind the retribution and deterrence justifications for punishment.¹¹ The Court rejected the idea of considering age on a case by case basis noting that such a practice could lead to the unfortunate consequence where, "[i]n some cases, a defendant's youth may even be counted against him."¹² While acknowledging the difficulty of line drawing with categorical rules, the Court nevertheless chose eighteen years of age as the categorical dividing line between juveniles and adults because that is where society has often drawn the line.¹³ Justice Scalia, dissenting in *Roper*, argued that the Court's reliance on scientific studies was faulty.¹⁴ He noted that the studies were never tested in an adversarial setting and the Court did not know whether the studies were methodologically sound.¹⁵

¶3 In developments post-*Roper*, the Supreme Court has heard oral argument in two cases regarding the constitutionality of juvenile life imprisonment without the possibility of parole (JLWOP): *Graham v.*

⁶ Michelle Haddad, Note, *Catching Up: The Need for New York State to Amend its Juvenile Offender Law to Reflect Psychiatric, Constitutional, and Normative Trends over the Last Three Decades*, 7 CARDOZO PUB. L. POL'Y & ETHICS J. 455, 477–78 (2009).

⁷ *Id.*

⁸ See *Roper v. Simmons*, 543 U.S. 551, 578 (2005).

⁹ *Id.* at 569–78.

¹⁰ *Id.* at 570.

¹¹ *Id.* at 571.

¹² *Id.* at 572–73.

¹³ *Id.* at 574.

¹⁴ *Id.* at 617 (Scalia, J., dissenting).

¹⁵ *Id.*

Florida and *Sullivan v. Florida*.¹⁶ *Graham* involves a challenge to a JLWOP sentence for Terrance Jamar Graham, who was convicted as an accomplice to an armed burglary and an attempted robbery of a restaurant.¹⁷ Graham was sixteen at the time of the crime. *Sullivan* involves Joe Harris Sullivan, sentenced to JLWOP for a sexual battery committed when Sullivan was thirteen years old.¹⁸

¶4 Defense attorneys in both cases have relied on psychological and scientific studies to argue that the reduced culpability of juveniles renders the JLWOP punishment disproportionate and unconstitutional under the Eighth Amendment.¹⁹ Critics of this approach argue that, for a variety of reasons explored in Part III, neuroimaging studies should not be considered when deciding the constitutionality of JLWOP.²⁰

¶5 The Court may: (1) decide to implement a categorical rule, holding that it is unconstitutional for juveniles under a certain age to receive a JLWOP sentence, (2) require that judges take age into account on a case by case basis, or (3) hold that JLWOP sentences are constitutional for both thirteen year-olds like Sullivan and seventeen year-olds like Graham. The oral arguments provide some insight into how the Court may resolve the cases. In both proceedings, Chief Justice Roberts proposed the individualized, case by case analysis solution, noting “perhaps it makes sense to consider in a particular instance whether the penalty is disproportionate, given the juvenile’s characteristics.”²¹ Chief Justice Roberts further noted, “[i]f you go on a case by case basis, there are no line-drawing problems. You just simply say age has to be considered as a matter of the Eighth Amendment.”²² The implications that the Court’s potential outcomes would have on the use of neuroscience in juvenile justice are explored in Part IV.

¹⁶ See generally Transcript of Oral Argument, *Graham v. Florida*, No. 08-7412 (U.S. Nov. 9, 2009); Transcript of Oral Argument, *Sullivan v. Florida*, No. 08-7621 (U.S. Nov. 9, 2009).

¹⁷ Lauren Fine, Comment, *Death Behind Bars: Examining Juvenile Life Without Parole in Sullivan v. Florida and Graham v. Florida*, 5 DUKE J. CONST. L. & PUB. POL’Y SIDEBAR 24, 27–28 (2009).

¹⁸ *Id.* at 25–26.

¹⁹ See generally Brief for Petitioner, *Graham v. Florida*, No. 08-7412 (U.S. July 16, 2009); Brief for Petitioner, *Sullivan v. Florida*, No. 08-7621 (U.S. July 16, 2009).

²⁰ See, e.g., Snead, *supra* note 2, at 1288–89.

²¹ Transcript of Oral Argument at 21, *Graham*, No. 08-7412.

²² *Id.* at 37.

II. THE ARGUMENT THAT NEUROSCIENCE SHOULD INFLUENCE THE SUPREME COURT'S DECISION

A. *The Developing Brain During Adolescence*

¶6 Supporters of the use of neuroscience in this debate point to the new knowledge that neuroscientists have gained from the advent of MRI and fMRI technology. The MRI “constructs a computerized image of the brain by measuring the signal strengths of the various radio frequencies emitted by the proton nuclei of atoms in brain tissue when the protons are placed in a strong magnetic field.”²³ Using MRI technology, scientists have discovered that the frontal cortex—the part of the brain that controls executive functions—is the last part of the brain to fully develop.²⁴ These executive functions include “impulse control, reasoning, abstract thinking, imagining, planning behavior, and anticipating consequences.”²⁵ The frontal lobe develops through pruning, in which a decrease in gray matter makes cells more efficient, and an increase of myelin (white matter) around brain cells increases “the speed and reliability of brain communication.”²⁶

¶7 Because the frontal lobe is still developing, juveniles’ brains rely more on the amygdala, at the base of the brain, when reacting to stressful stimuli.²⁷ The amygdala controls behavior related to instinct and survival.²⁸ “Actions controlled by this sector of the brain are characterized as emotional, impulsive, and often aggressive.”²⁹ This research indicates that “novel situations and emotional arousal especially challenge adolescents’ ability to exercise judgment and self-control and contribute to short-sighted, impulsive decisions and risky behavior.”³⁰ Scientists have learned this information through the use of the fMRI, “which essentially amounts to making a movie of changes in blood flow in the brain as test subjects are exposed to stimuli or perform various tasks.”³¹

²³ Snead, *supra* note 2, at 1281.

²⁴ Haddad, *supra* note 6, at 479.

²⁵ Barry C. Feld, *Unmitigated Punishment: Adolescent Criminal Responsibility and LWOP Sentences*, 10 J. L. & FAM. STUD. 11, 59 (2007).

²⁶ Christopher L. Dore, Comment, *What to Do with Omar Khadr? Putting a Child Soldier on Trial: Questions of International Law, Juvenile Justice, and Moral Culpability*, 41 J. MARSHALL L. REV. 1281, 1307 (2008).

²⁷ Feld, *supra* note 25, at 60–61.

²⁸ Dore, *supra* note 26, at 1306.

²⁹ *Id.*

³⁰ Feld, *supra* note 25, at 61.

³¹ Jay D. Aronson, *Neuroscience and Juvenile Justice*, 42 AKRON L. REV. 917, 924 (2009).

B. The Argument that Neuroimaging Studies Should Affect the Law

¶8 Many argue that we must use what we have learned from the advances in technology since the early 1990s in our assessment of what punishments are proportionate for juvenile offenses.³² Proponents note that neuroimaging studies, in addition to psychological studies, are “the best, most sophisticated source of information about how children actually develop.”³³ Further, neuroscience validates the wealth of psychological studies on juveniles’ immaturity, thus lending a “hard science” base to a “soft science” argument.³⁴ The studies provide scientific data that “simply reinforces the (once) noncontroversial idea that, as a group, young people differ from adults in systematic ways directly relevant to their relative culpability, deterrability, and potential for rehabilitation.”³⁵

¶9 Proponents of the importance of neuroscience also argue that juveniles, because of their neurological and psychological limitations, are less able to participate in the justice process than adults.³⁶ They are “less able to knowingly, intelligently, and voluntarily consent to searches, participate in identification procedures, waive Miranda rights, confess, waive counsel, or enter a guilty plea.”³⁷ They may not be able to understand judicial proceedings and they may be less able to help their attorney assist them.³⁸ Further, neuroscience suggests juveniles are less able to make important decisions in a “rational and self-protective manner.”³⁹ These inabilities could lead to results that our criminal justice system is meant to avoid, such as false confessions or ineffective assistance of counsel.

¶10 Juvenile advocates also argue, as Justice Stevens acknowledged in *Roper*, that the traditional justifications for punishment are weakened by the scientific evidence rendering juveniles less culpable for their criminal acts.⁴⁰ Science and common sense indicate that juveniles are not as

³² See, e.g., Staci A. Gruber & Deborah A. Yurgelun-Todd, *Neurobiology and the Law: A Role in Juvenile Justice?*, 3 OHIO ST. J. CRIM. L. 321, 333 (2006).

³³ Emily Buss, *Rethinking the Connection Between Developmental Science and Juvenile Justice*, 76 U. CHI. L. REV. 493, 507 (2009).

³⁴ Feld, *supra* note 25, at 61.

³⁵ Terry A. Maroney, *The False Promise of Adolescent Brain Science in Juvenile Justice*, 85 NOTRE DAME L. REV. 89, 94 (2009).

³⁶ See *id.* at 111–15.

³⁷ *Id.* at 111.

³⁸ *Id.* at 112.

³⁹ *Id.*

⁴⁰ See *Roper v. Simmons*, 543 U.S. 551, 571 (2005) (“Once the diminished culpability of juveniles is recognized, it is evident that the penological justifications for the death penalty apply to them with lesser force than to adults.”).

blameworthy as adults.⁴¹ Further, and perhaps most importantly, they have a great potential to reform and rehabilitate as their brains mature and their personalities develop.⁴² As with the death penalty, life without parole is less of a deterrent for juveniles because “the same characteristics that render juveniles less culpable than adults suggest as well that juveniles will be less susceptible to deterrence.”⁴³ Justice Stevens notes that juveniles are much less likely to engage in a cost-benefit analysis.⁴⁴ Further, Justice Stevens writes that “[r]etribution is not proportional if the law’s most severe penalty is imposed on one whose culpability or blameworthiness is diminished, to a substantial degree, by reason of youth and immaturity.”⁴⁵ The same logic applies to JLWOP, the most severe penalty for any person regardless of age in some jurisdictions.

¶11 Finally, proponents of the use of neuroscience in the JLWOP debate argue that, unlike many situations, the science is relatively easy to incorporate into the law. Unlike many other uses for neuroscience in criminal law, such as mental retardation, the science here could be applied accurately to a class without the need for neuroimaging in individual cases.⁴⁶

III. THE ARGUMENT AGAINST TURNING TO NEUROSCIENCE

¶12 While many find the arguments for using neuroscience in the JLWOP debate persuasive, others caution against its use for a number of reasons. The central criticism involves the quality of the scientific data. Brain imaging research is “still in its infancy.”⁴⁷ When courts rely upon scientific evidence, there is always a risk of bad or misused data; the novelty of brain imaging research increases this risk.⁴⁸ “[O]ver time, the high-quality work can be distinguished from the low, and data can be applied in an increasingly fine-grained way.”⁴⁹

¶13 There has been criticism of the studies used by the Court in *Roper* and other similar studies.⁵⁰ Many of the studies have small sample sizes and potential sample selection biases.⁵¹ Further, there were flaws within the

⁴¹ *See id.*

⁴² *See Maroney, supra* note 35, at 110–11.

⁴³ *Roper v. Simmons*, 543 U.S. 551, 571 (2005).

⁴⁴ *See id.* at 572.

⁴⁵ *Id.* at 571.

⁴⁶ *See Maroney, supra* note 35, at 94.

⁴⁷ Buss, *supra* note 33, at 509.

⁴⁸ *Id.* at 507.

⁴⁹ *Id.* at 508. *See also* Katt, *supra* note 3, at 270 (“Science is constantly evolving as technology and human knowledge advances.”).

⁵⁰ *See, e.g.,* Katt, *supra* note 3, at 255.

⁵¹ *See* Aronson, *supra* note 31, at 924.

studies. In one study, the participants were presented with black and white images from the 1970s, which may have caused juvenile participants to react differently than adults independently of their brain development.⁵² It appears that this study, important for the understanding of the amygdala, was never formally published in a peer-reviewed journal.⁵³

¶14 One criticism, which repeatedly arises, is that scientists have not gone far enough to link differences in individual brains to differences in behavior.⁵⁴ Many scientists do not agree that the studies should be used to guide the Court's decision in cases like *Graham* and *Sullivan*.⁵⁵ These scientists are uncomfortable introducing neuroscience "into the legal system before it is understood exactly how specific brain traits relate to the real-life decision making and behavior of teens in high-stress situations."⁵⁶

¶15 Many scientists who understand the weaknesses in the data and their link to actual behavior are concerned that judges and legislators will not be able to accurately assess the data.⁵⁷ In particular, amicus curiae briefs are not subject to the gate keeping and the normal checks involved with scientific evidence, including cross-examination of witnesses.⁵⁸ There is the further danger that lawyers, in order to compete in the adversarial process, will oversimplify the scientific evidence and mislead the judge or justices.⁵⁹ Due to the limitations on a court, and particularly on the Supreme Court, in assessing the accuracy of the evidence, some argue that scientific evidence should only be influential in a juvenile justice debate held in a legislature rather than a courtroom.⁶⁰

¶16 Another argument made by those who oppose the use of neuroscience research in the Supreme Courts' decisions is that we must exercise caution when making direct connections between biology and criminality.⁶¹ Critics note that "[c]riminal law and neuroscience have been engaged in an ill-fated and sometimes tragic affair for over two hundred years."⁶² This concern is further alarming because of the trust people place

⁵² *Id.* at 925–26.

⁵³ *Id.*

⁵⁴ *See, e.g.,* Maroney, *supra* note 15, at 148.

⁵⁵ *See* Aronson, *supra* note 31, at 928.

⁵⁶ *Id.*

⁵⁷ *See, e.g.,* Buss, *supra* note 33, at 507.

⁵⁸ Katt, *supra* note 3, at 254.

⁵⁹ Maroney, *supra* note 35, at 160.

⁶⁰ *See id.* at 169.

⁶¹ *See* Aronson, *supra* note 31, at 929 (“[W]e must not submit to a new kind of biological determinism which posits that behavior is merely the ‘calculable [consequence] of an immense assembly of neurons firing.’”) (citation omitted).

⁶² Amanda C. Pustilnik, *Violence on the Brain: A Critique of Neuroscience in Criminal Law*, 44 WAKE FOREST L. REV. 183, 183 (2009).

in science.⁶³ These critics point to the fact that more than biology must be at play because, despite similar brain development, most juveniles do not commit heinous crimes.⁶⁴

¶17 Proponents of allowing state legislatures to make decisions regarding JLWOP point out the impracticalities of alternative approaches when using neuroimaging data.⁶⁵ First, the age limit that one must draw with a categorical rule is very difficult to draw according to the neuroimaging research.⁶⁶ Much of the research indicates that brains are developing into an individual's mid-twenties.⁶⁷ This age range does not comport with what the law and society have traditionally recognized as the line between adolescence and adulthood. Further, if individuals are judged on a case by case basis, perhaps the elderly would be less culpable for their crimes because their neurons are not as efficient as a middle-aged adult.⁶⁸

¶18 Perhaps the strongest argument raised by opponents of neuroscience in the JLWOP debate is that this issue presents a moral and legal question, not a scientific one.⁶⁹ Many would argue that, while the neuroscience may show that juveniles are less culpable than adults, they are still culpable enough to be punished with life without parole.⁷⁰ "Relative deficiencies do not necessarily take juveniles below a legal threshold but may instead show that they exceed it by a lower margin."⁷¹ This is an argument that Justice O'Connor made in her dissent in *Roper*,⁷² and it is an argument that may very well influence the Court in their decisions in *Graham v. Florida* and *Sullivan v. Florida*.

IV. THE ROLE OF NEUROSCIENCE IN JUVENILE JUSTICE POST-*SULLIVAN* AND *GRAHAM*

¶19 The effectiveness of using neuroimaging results as an argument for juvenile justice reform will be greatly affected by how the Supreme Court rules in *Sullivan* and *Graham*. If the Court decides that the sentences are constitutional in both cases, juvenile advocates will have to attempt to

⁶³ See Katt, *supra* note 3, at 269–70 (“[O]ur reverence of science is such that questioning it seems almost ridiculous.”).

⁶⁴ See Aronson, *supra* note 31, at 929–30.

⁶⁵ See, e.g., Maroney, *supra* note 35, at 152–54.

⁶⁶ *Id.*

⁶⁷ *Id.* at 152.

⁶⁸ See, e.g., *id.* at 153–54.

⁶⁹ See Maroney, *supra* note 35, at 150; Buss, *supra* note 33, at 510; Aronson, *supra* note 31, at 928 (“[S]ome commentators . . . [believe] capital punishment is an ethical and moral issue, not a scientific one.”).

⁷⁰ See Maroney, *supra* note 35, at 150.

⁷¹ *Id.*

⁷² *Roper v. Simmons*, 543 U.S. 551, 591 (2005) (O'Connor, J., dissenting).

persuade legislatures to make an exception for juveniles under a certain age or eliminate the penalty altogether. Given the political pressure to be tough on crime, this would be a difficult task. “It is an unfortunate political reality that modern crime policy tends to be a one-way ratchet consistently trending in the direction of more punishment.”⁷³

¶20 If the Supreme Court holds that judges must consider a defendant’s age in order to comport with the Eighth Amendment, individual defense attorneys will be left to make the reduced culpability argument based on neuroimaging in each individual case. While it seems attorneys could be successful based on the argument above that science is persuasive, the only systematic review of cases in which this was attempted reveals that it is actually a rather ineffective strategy.⁷⁴ The cases “strongly suggest that neuroscience does not materially shape legal decision makers’ beliefs and values about youthful offenders but instead will be read through the lens of those beliefs and values.”⁷⁵ This is made more difficult by the idea that the elements of a crime under the law and the implications of the scientific findings do not track each other.⁷⁶ For example, “intentional mens rea asks only whether a defendant desired or knew that a result would obtain, while neuroscientific arguments invite a focus on substantive irrationality notwithstanding specific intent.”⁷⁷ This research, while limited to one study, suggests that presenting neuroimaging research on a case by case basis approach, as Chief Justice Roberts seemed to advocate in the oral arguments for *Graham* and *Sullivan*, would have little effect on the current state of juvenile life without parole.⁷⁸

¶21 The third path the Supreme Court may choose is to set an age below which it is unconstitutional to sentence a juvenile to life imprisonment without parole. This result would be the most favorable for proponents of incorporating neuroimaging research into juvenile justice. Because the defense attorneys largely argued the cases based on the neuroscientific and psychological research, a categorical rule would seem to validate their arguments. This result would leave open the door for incorporating additional neuroscientific research into juvenile justice policy in the future.

⁷³ Maroney, *supra* note 35, at 169.

⁷⁴ *See id.* at 93.

⁷⁵ *Id.* at 89.

⁷⁶ *Id.* at 93.

⁷⁷ *Id.* at 94.

⁷⁸ *See, e.g.*, Transcript of Oral Argument at 21, *Graham v. Florida*, No. 08-7412 (U.S. Nov. 9, 2009) (“[P]erhaps it makes sense to consider in a particular instance whether the penalty is disproportionate.”).

CONCLUSION

¶22 The *Graham* and *Sullivan* cases currently before the Supreme Court will likely have a significant impact on the role that neuroimaging technology plays in making future decisions regarding juvenile justice. While there are staunch proponents of using neuroscientific research to determine what punishments are disproportionate for juveniles, there are also many arguments against it. The Court's decision will, implicitly if not explicitly, validate the arguments on one side or the other. If the Court fails to create a categorical ban on life without parole for juveniles below a certain age, proponents of incorporating neuroimaging research into the treatment of juveniles in criminal law will face an uphill battle. If, however, the Court does choose to implement a categorical ban, the door for neuroscientific research opened in *Roper* will remain open for juvenile advocates to further reform the system in the future.