

1-1-2015

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Recommended Citation

20 Suffolk J. Trial & App. Advoc. 92 (2015)

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A NEW ERA IN JUVENILE JUSTICE: EXPANDING THE SCOPE OF JUVENILE PROTECTIONS THROUGH NEUROPSYCHOLOGY

*“The qualities that distinguish juveniles from adults do not disappear when an individual turns 18.”*¹

I. INTRODUCTION

Given this premise asserted by the Supreme Court, why do the constitutional protections for juveniles vanish on an individual’s eighteenth birthday?² The explanation articulated by the Second Circuit is that (1) a line must be drawn to pronounce a categorical rule, and (2) eighteen is the traditional age where society draws that line between adolescence and adulthood.³ However, recent developments in neuropsychology have led many to question the validity of such an arbitrary rule, especially as the level of culpability between juveniles and adults continues to expand in the courtroom.⁴

Over the past ten years, the Supreme Court delivered a series of monumental decisions that redefined the constitutional limits on sentencing juveniles.⁵ At the same time, neuroscience research exploded, offering new insight into how the average brain develops into one’s early to mid-twenties.⁶ The combined impact of the Supreme Court’s recent decisions and neuropsychologists’ findings on adolescent brain development sparked

¹ *Roper v. Simmons*, 543 U.S. 551, 574 (2005) (noting one’s age not always indicative of one’s maturity level).

² *See id.* at 575 (holding juveniles’ age and maturity prohibits them from capital punishment).

³ *See United States v. Reingold*, 731 F.3d 204, 230-31 (2d Cir. 2013) (defining adulthood at age eighteen).

⁴ *See United States v. C.R.*, 792 F. Supp. 2d 343, 507-08 (E.D.N.Y. 2011) (finding juvenile protections applicable to nineteen-year olds); *see also infra* Part II (identifying recent case law with additional constitutional limits for sentencing juveniles).

⁵ *See Roper*, 543 U.S. at 574 (prohibiting juveniles from capital punishment); *Florida v. Graham*, 560 U.S. 48, 81 (2010) (prohibiting juveniles convicted of non-homicide offenses from being sentenced to life in prison); *Miller v. Alabama*, 132 S. Ct. 2455, 2465-66 (2012) (holding juveniles cannot be sentenced to life in prison regardless of offense).

⁶ *See infra* Part III.A (illustrating recent developments in neuroscience and ongoing investments by public and private entities).

litigation over whether the same safeguards established by the Supreme Court for juveniles should apply to individuals through early adulthood.⁷ The confluence of legal and scientific advancements in this area pose difficult questions for policymakers and constitutional scholars over the appropriate level of punishment for young adults, which could lead to a turning point in the history of juvenile justice.⁸

This Note argues that the legal community must reexamine the question of culpability as applied to young adults who satisfy the criteria established by the Supreme Court in *Roper*, *Graham*, and *Miller*—focusing specifically on recent developments in neuropsychology.⁹ Part II of this note explores how juvenile justice evolved from feudal times to the present and how contemporary scholarship in the field of psychology played a vital role in each stage of judicial advancement.¹⁰ Part III outlines the recent developments in neuropsychology and how these advancements were critical to a district court reducing a nineteen year-old defendant’s sentence to half the statutory minimum, a decision subsequently overturned by the Second Circuit.¹¹ Part IV analyzes the most appropriate forum to develop proper sentencing policy for young adults.¹²

II. PAST AND CURRENT JURISPRUDENCE CONCERNING JUVENILE JUSTICE

A. *The Evolution of Juvenile Justice*

The State’s interest in differentiating between juveniles and adults in administering justice can be traced back to the feudal era in England.¹³

⁷ See *infra* Part III.B (presenting success and failure of this argument in federal courts); see also *infra* note 81 (listing additional cases questioning safeguards for young adults).

⁸ See *infra* Part IV (proposing Sentencing Commission conduct comprehensive report on appropriate judicial response moving forward).

⁹ See *Miller*, 132 S. Ct. at 2475 (holding mandatory life sentences without possibility of parole unconstitutional for juvenile offenders); *Graham*, 560 U.S. at 81 (holding juveniles cannot be sentenced to life without parole for non-homicide offenses); *Roper*, 543 U.S. at 556 (prohibiting death sentence for juveniles); see also *C.R.*, 792 F. Supp. at 519-20 (extending Court’s rationale for juveniles to nineteen-year olds).

¹⁰ See *infra* Part II (illustrating evolution of juvenile justice in United States).

¹¹ See *infra* Part III (demonstrating impact of neuroscience in recent court decisions).

¹² See *infra* Part IV (presenting future methods in evaluating juvenile justice).

¹³ See HERBERT H. LOU, *JUVENILE COURTS IN AMERICA* 3 (1927) (outlining juvenile justice origins). As far back as the tenth century, Saxon King Athelstane attempted to reform juvenile justice by enacting similar laws to our current juvenile courts, including probation. *Id.* at 13. Besides this attempt, there is limited historical information as to the protections safeguarding children throughout the Middle Ages. *Id.* However, evidence shows that severe punishments

In 1772, Lord Jekyll in *Eyre v. Shaftsbury* declared “[t]he care of all infants is lodged in the king as *parens patriae* . . .”¹⁴ This common law doctrine that the State protects juveniles, along with the legal maxim that no person can be found guilty of a crime without proof of a mens rea, sufficiently concluded that a child under the age of seven was incapable of felonious intent and should be placed in a separate category for determining punishment.¹⁵ Conversely, individuals between the ages of seven and fourteen could be shown to have a guilty mind and were largely held to the same standard as adults.¹⁶ These standards continued to evolve through the turn of the twentieth century when progressive reformers confronted the social injustices with respect to the treatment of juveniles, and thereby implemented the first set of reforms in the modern treatment of juvenile offenders, including the first juvenile court established in Chicago in 1899.¹⁷

The establishment of juvenile courts quickly spread throughout the

inflicted on children reached a climax in the seventeenth and eighteenth centuries. *Id.* at 13-14 (referencing death sentences to children as young as eight and ten).

¹⁴ *Id.* at 3 (explaining common law doctrine’s development in England). The common law doctrine of *parens patriae*, the king is the father of his country, was the medieval illustration of the modern view that the State has a primary interest in society as the guardian of social values. *Id.* at 4.

¹⁵ *See id.* at 6 (“A child under seven years of age has been treated as being . . . incapable of felonious intent.”); *see also In re Gault*, 387 U.S. 1, 16 (1967) (holding children under age seven incapable of felonious intent). Beyond age seven, children were “subjected to arrest, trial, and in theory to punishment like adult offenders.” *In re Gault*, 387 U.S. at 16. An individual’s guilt or innocence is therefore dependent upon their psychological condition, which inevitably depends partly on their age. *See* LOU, *supra* note 13, at 6 (developing history of juvenile justice).

¹⁶ *See* Kimberly Larson, Frank DiCataldo & Robert Kinscherff, *Juveniles are Different: Miller v. Alabama: Implications for Forensic Mental Health Assessment at the Intersection of Social Science and the Law*, 39 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 319, 320 (2013). Prior to the twentieth century, the majority of individuals between the ages of seven and eighteen were “adjudicated in the same system, governed by the same arrest and trial procedures, with the same sentencing options available to courts hearing the cases of adult defendants.” *Id.*; *see State v. Guild*, 10 N.J.L. 163, 190 (1828) (sentencing thirteen year-old boy to death for offense committed when he was twelve).

¹⁷ *See* LOU, *supra* note 13, at 16-20 (discussing establishment of first juvenile court in the United States). Towards the end of the nineteenth century, several states began adopting certain laws to provide broader protections for juveniles. *Id.* at 16. For example, Boston enacted a law in 1870, which required “separate hearings . . . for the trial of the juvenile offender.” *Id.* In “recognizing the differences between youth and adults with regard to their lessened culpability and greater amenability to rehabilitation and treatment,” social reformers established the first juvenile court. *See* Larson, DiCataldo & Kinscherff *supra* note 16, at 320-21. These juvenile courts were not only separate legal proceedings, but were focused on rehabilitation rather than punishment. *Id.* The reformers “envisioned a new system that would utilize the *parens patriae* power of the state to step in and assist youth in reforming their lives where, they felt, the child’s own parents had failed.” *Id.* at 321.

United States, and states began experimenting with their structure.¹⁸ In 1921, the United States Children's Bureau appointed a Committee composed of fourteen judges, doctors, and other social policy experts to develop Juvenile Court Standards.¹⁹ Among these standards, the Committee recommended that the jurisdictional age limit for juvenile state courts be no lower than eighteen.²⁰ The Committee also recognized the importance of another field gaining favor in the legal system as well as mainstream society, that "[t]he judge should be chosen because of his special qualifications . . . legal training, acquaintance with social problems, and understanding of *child psychology*."²¹ The emergence of pediatric psychology as a legally recognized discipline in the late nineteenth century and early twentieth century played a tremendous role in the development of juvenile courts, which were used as rehabilitation tools rather than simply

¹⁸ See LOU, *supra* note 13, at 22-25 (describing spread of juvenile court laws as "remarkably rapid"); Julian W. Mack, *The Juvenile Court*, 23 HARV. L. REV. 104, 107 (1909) (discussing birth of juvenile justice system). Within five years, Pennsylvania, Wisconsin, New York, Maryland, California, Missouri, New Jersey, Indiana, and Iowa passed juvenile court laws. See LOU, *supra* note 13, at 22. More than twenty states and the District of Columbia created similar courts within ten years. *Id.* at 24. Due to the pioneering nature of these courts, each state developed unique ways to confront "new types of staff, new modes of preliminary procedure, of hearing, and of detention . . . gathering facts . . . and new methods and facilities for making disposition of cases." *Id.* at 25.

¹⁹ See James J. Davis & Grace Abbott, *Juvenile Court Standards*, U.S. DEPARTMENT OF LABOR, CHILDREN'S BUREAU (May 18, 1923), <http://www.mchlibrary.info/history/chbu/20531-1923.PDF> (outlining Commission's findings and recommendations). The Committee worked on these standards for two years and sent drafts to over 200 people including judges, probation officers, officers of child-care agencies, and a number of others for feedback. *Id.* In its foreword, the Committee summarized the principles of the juvenile standard to be: "(1) the court[s] dealing with children should be clothed with broad jurisdiction . . . ; (2) the court should have a scientific understanding of each child; (3) that treatment should be adapted to individual needs; (4) there should be a presumption of keeping the child in his own home . . ." *Id.* at vi.

²⁰ See *id.* at 2 (recommending anyone under eighteen fall within juvenile courts' jurisdiction). According to the Committee, "[t]he age limit under which the court may obtain jurisdiction in children's cases should be not lower than 18 years." *Id.* Furthermore, the Committee noted that "[j]urisdiction once obtained should continue until 21 years of age . . ." *Id.* Although a number of states conformed with the 1921 report, many states continued to set their own specific standards. See LOU, *supra* note 13, at 47 (indicating age range in most states to be between sixteen and twenty-one). For instance, the jurisdictional age limit in Colorado is eighteen but the court's jurisdiction is exclusive only up to sixteen years of age, allowing sixteen year-olds to be tried in criminal courts. *Id.* at 51. Certain counties in Wisconsin, on the other hand, hear cases of youths up to age twenty-one. *Id.* at 51-52.

²¹ Davis & Abbott, *supra* note 19, at 2 (emphasis added) (stating juvenile court judges' qualifications); REYERSON, *infra* note 22 and accompanying text (explaining social views that impacted juvenile justice). This emphasis on rehabilitation encouraged reformers to advocate for a background in sociology and child psychology within the judiciary. See generally Davis & Abbott, *supra* note 19, at 41-44.

administering punishment.²²

With the infusion of psychology and a renewed focus on rehabilitation, juvenile court procedures became exceptionally informal and provided judges with broad discretion in administering punishments.²³ Several states continued to apply widely divergent techniques in these proceedings until the mid-twentieth century when the U.S. Supreme Court established constitutional protections that must be recognized by juvenile courts. In *Haley v. State of Ohio*, *Gallegos v. Colorado*, and *In re Gault*.²⁴ Together, these cases changed the structure of juvenile courts, defining formal due process protections.²⁵ After requiring procedural safeguards in the 1960s, the Supreme Court was largely silent on the issue of juveniles' due process rights for the next forty years, with few exceptions.²⁶

Following a wave of juvenile crime between the 1980s and 1990s,

²² ELLEN RYERSON, *THE BEST LAID PLANS: AMERICA'S JUVENILE COURT EXPERIMENT* 22-26 (Hill & Wang 1978) (explaining social and philosophical views behind judicial reform). A new school of criminology developed at the end of the nineteenth century fueling additional social reforms. See *id.* Experts in criminology and psychology began looking towards environmental and economic factors shifting "[t]he view of the criminal as someone constrained or guided in his moral choices by forces beyond his control [which] came to dominate the thinking of period." *Id.* at 22. Juvenile court reformers adopted these views, arguing "the fundamental purpose of juvenile court proceedings is not to determine whether or not a child has committed a specific offense, but to discover whether he is in a condition requiring the special care of the State. . . ." *Id.* at 43 (quoting 1920 survey of juvenile courts).

²³ See LOU, *supra* note 13, at 71-74 (describing changes in juvenile sentencing procedures). Judges bore the responsibility "to know the mind of the child in order to understand his point of view [was] the first step toward the individualization of treatment." *Id.* at 73-74. Due to the court's rehabilitative purpose, "procedures were informal and dispositions were indeterminate." Elizabeth S. Scott & Laurence D. Steinberg, *Adolescence and the Regulation of Youth Crime*, in *LESS GUILTY BY REASONS OF ADOLESCENT* 33 (2008). A typical statute in the middle of the twentieth century advised that "[t]he court may conduct the hearing in an informal manner and may adopt any form of procedure in such cases which it deems best suited to ascertain the facts." See Mack, *supra* note 18, at 107 (internal quotation marks omitted).

²⁴ *In re Gault* 387 U.S. 1, 40-41 (1967) (holding juveniles have right to attorney and other protections afforded to adults); *Gallegos v. Colorado*, 370 U.S. 49, 54-55 (1962) (increasing protections for juveniles in interrogation contexts); *Haley v. Ohio*, 332 U.S. 596, 601 (1948) (stating fifteen-year olds do not fully appreciate reading of constitutional rights).

²⁵ See Larson, DiCataldo & Kinscherff *supra* note 16, at 321-22 (explaining Supreme Court's decision to establish formal due process rights for juveniles). Over the course of these cases, the Supreme Court confronted the lack of formal protections created by juvenile courts. See *id.* For example, in *Haley*, the Court recognized that juveniles need counsel when being brought into custody. *Haley*, 332 U.S. at 600 ("He needs counsel and . . . [h]e needs someone on whom to lean lest the overpowering presence of the law, as he knows it, may not crush him."). "In both *Gault* and its predecessor *Kent v. United States*, the Court described a juvenile system that had failed to realize its laudable goals and was meting out punishments just as harsh as those in the adult system but without the protections afforded adults." Larson, *supra* note 16, at 322.

²⁶ See Larson, DiCataldo & Kinscherff *supra* note 16, at 322 (discussing lack of Supreme Court action following *In re Gault*).

the United States saw public opinion of juveniles decline, which in turn led to stronger penalties and harsher treatment towards juveniles in the courtroom.²⁷ Due to the increasing social concerns, as well as a number of developments in the field of psychology, the Supreme Court once again confronted juveniles' constitutional protections, thus rekindling the juvenile justice debate and embracing developments within psychology and neuropsychology to define a new era of juvenile justice.²⁸

B. Reliance on Psychology Pushes Court to Expand Constitutional Protections

In its landmark case of *Roper v. Simmons*²⁹ in 2005, the Supreme Court held that juveniles cannot be considered the worst of society; therefore, the Eighth and Fourteenth Amendments forbid imposition of the death penalty on individuals under the age of eighteen.³⁰ The Court defined three general differences between juveniles and adults: (1) lack of maturity and underdeveloped sense of responsibility, (2) their susceptibility

²⁷ See *id.* at 322-23 (illustrating changes following rise in juvenile crimes); see also Mack, *supra* note 18, at 33 (examining impact of violent crimes on social perception of juveniles). In the 1990s, juveniles "were being transferred to the adult system more frequently, at younger ages, for more offenses." Larson, DiCataldo & Kinscherff *supra* note 16, at 322-23. Additionally, conservative politicians attacked rehabilitative reforms within the juvenile justice system as failures. See Mack, *supra* note 18, at 33. Although the juvenile justice ideal of rehabilitation may have come a long way since 1899, the description of wayward children who responded to the sympathetic and caring juvenile courts "seemed to bear little relation to the reality of youth crime in the late 20th century." *Id.*

²⁸ See *infra* Part II.B (outlining most recent Supreme Court cases concerning juvenile justice); see also Larson, DiCataldo & Kinscherff *supra* note 16, at 322-23 (discussing social and political events leading up to Supreme Court decisions in past decade).

²⁹ *Roper v. Simmons*, 543 U.S. 511, 567-68 (2005)

³⁰ See *id.* (holding juveniles' age and maturity prohibits them from receiving death penalty). In *Roper*, the defendant was seventeen when he committed murder. *Id.* at 555. Nine months following the murder, after he had turned eighteen, he was convicted and sentenced to death. *Id.* To decide that the application of the death penalty to juveniles is unconstitutional, the Court relied heavily on its decision in *Atkins*. See *id.*; see also *Atkins v. Virginia*, 536 U.S. 304, 321 (2002) (concluding Eighth Amendment forbids mentally challenged individuals from capital punishment). In *Atkins*, the Court held that because mentally challenged individuals "have diminished capacities to understand and process information . . . [and] learn from experience . . . [t]here is abundant evidence that they often act on impulse rather than pursuant to a premeditated plan Their deficiencies do not warrant an exemption from criminal sanctions, but they do diminish their personal culpability." *Atkins*, 536 U.S. at 318. The Court applied a similar rationale in *Roper*, concluding that "once juveniles diminished culpability is recognized, it is evident that neither of the two penological justifications for the death penalty—retribution and deterrence . . . provides adequate justification for imposing that penalty on juveniles." *Roper*, 543 U.S. at 553 (internal quotation marks omitted).

to negative influences and peer pressure, and (3) their character is not as well-formed.³¹ By declaring that an individual should be given special consideration in mitigation, due to their age and level of maturity, the Court relied heavily on psychologists and opened the door for attorneys to begin expanding this concept to individuals that may still be considered immature but are over the age of eighteen.³²

Five years following *Roper*'s categorical decree, the Court

³¹ See *Roper*, 543 U.S. at 570-72. In support of the first two elements, the Court cited behavioral studies focused on reckless adolescents. See *id.* at 569 (exploring external factors affecting juveniles' decisions); see also Jeffrey Arnett, *Reckless Behavior in Adolescence: A Developmental Perspective*, 12 DEVELOPMENTAL REVIEW 339, 339 (1992) (emphasizing statistics for reckless behavior in youths); Scott & Steinberg, *supra* note 23, at 1014 (arguing for heightened vulnerability based on coercive circumstances). The third difference defined by the Court focused on an internal struggle faced by juveniles. See *Roper*, 543 U.S. at 570 (explaining how juveniles struggle to define their identity). The Court acknowledged this struggle is particular to adolescent years, and that as the individual matures, "a greater possibility exists that a minor's character deficiencies will be reformed." *Id.* at 570. The Court did not reference any neuropsychological support but the neuropsychological evidence found in two *amici curiae* appears to have been persuasive in this third category. See *id.* Compare Kimberly D. Phillips, *Empathy for Psychopaths: Using fMRI Brain Scans to Plea for Leniency in Death Penalty Cases*, 37 LAW & PSYCHOL. REV. 1, 14-19 (2012) (detailing how neuroimaging data used in defense briefs was persuasive), with Stephen J. Morse, *The Mind of a Child: The Relationship Between Brain Development, Cognitive Functioning, and Accountability Under the Law: Brain Overclaim Syndrome and Criminal Responsibility: A Diagnostic Note*, 3 OHIO ST. J. CRIM. L. 397, 410 (2006) [hereinafter *Mind of a Child*] (arguing neuroscience evidence "largely irrelevant" to Court's decision in *Roper*). Defense counsel briefs included research using magnetic resonance imaging (MRI) technology to examine the development of the brain over time. See Brief for the American Psychological Association, et. al. Amici Curiae Supporting Respondent, *Roper v. Simmons*, 543 U.S. 551 (2005) (No. 03-633), 2004 WL 1636447, at *9-13. The defendant's brief illustrated how the frontal lobes of the brain, which play a critical role in higher-order cognitive functions, continue to develop from ages seventeen to twenty-one. See *id.* The ability to capture these images was the result of groundbreaking technology that had its skeptics in the early 1990s. See *Mind of a Child*, *supra*, at 403 (describing recent technology's impact on understanding juveniles). Although this innovative research was absent from the Court's opinion, it provided compelling scientific evidence of *why* a juvenile's character is not well formed at age seventeen. See *id.* at 407-10.

³² See *Mind of a Child*, *supra* note 31, at 408 ("*Roper* has been the most important case to propose use of the new neuroscience to affect responsibility...."). In evaluating the psychiatrists' testimony regarding juveniles, the Court noted "[i]f trained psychiatrists with the advantage of clinical testing and observation refrain . . . from assessing any juvenile under 18 as having antisocial personality disorder, we conclude that States should refrain from asking jurors to issue a far graver condemnation—that a juvenile offender merits the death penalty." *Roper*, 543 U.S. at 573. Besides its impact on the law, *Roper* gained public attention as editorial pages began encouraging the Court's use of neuroscientific evidence. See *Mind of a Child*, *supra* note 31, at 408. (discussing how such evidence points to behavioral differences). Along with the psychological and sociological differences, the Court also acknowledged the influence of international opinion on prohibiting the death penalty to juveniles. *Roper*, 543 U.S. at 575-79 ("In sum, it is fair to say that the United States now stands alone in a world that has turned its face against the juvenile death penalty.").

expanded the rule to prohibit juveniles from being sentenced to life in prison without the possibility of parole for non-homicide offenses in *Graham*.³³ The *Graham* Court directly referred to the “nature of juveniles” outlined in *Roper* as support for why juveniles should not be sentenced to prison without parole; but in this case, the Court explicitly cited neuroscientific evidence as support.³⁴ The *Graham* Court discussed the petitioner’s brief on how developments in “brain science continue to show fundamental differences between juvenile and adult minds. . . . [and that] parts of the brain involved in behavior control continue to mature through late adolescence.”³⁵ Following *Graham*, the Eighth Amendment now protected juveniles outside the scope of capital punishment, and the Court demonstrated further confidence in citing psychology and neuropsychological evidence to support the differences between juveniles and adults.³⁶

Finally, in *Miller v. Alabama* the Supreme Court prohibited a sentence of life in prison without the possibility for parole for a juvenile convicted of homicide.³⁷ Again, the Court emphasized that as a child matures and “neurological development occurs, his deficiencies will be

³³ *Graham v. Florida*, 560 U.S. 48, 81-82 (2010) (expanding Court’s rule in *Roper* to exclude life sentences for non-homicide offenses). In *Graham*, the trial court adjudicated a sixteen year-old defendant of armed robbery and a series of other charges and sentenced him to life in prison without parole. *Id.* at 48. Because Florida abolished its parole system, the defendant had no possibility of release. *Id.* In considering the defendant’s age and its recent decision in *Roper*, the Court expanded the reach of the Eighth Amendment to prohibit “a juvenile offender to be sentenced to life in prison without parole for a nonhomicide crime.” *Id.*

³⁴ *See id.* at 68 (citing Supreme Court’s language in *Roper* as guidance); *infra* note 37 and accompanying text (quoting Supreme Court’s application of neuroscience evidence).

³⁵ *Graham*, 560 U.S. at 68 (citing neuroscientific evidence to show differences between juveniles and adults); *see* Jason Zolle, Commentary, *Transforming Juvenile Justice: Making Doctrine Out of Dicta in Graham v. Florida*, 112 MICH. L. REV. FIRST IMPRESSIONS 30, 31 (2013) (suggesting *Graham* requires criminal proceedings to consider youthful status of juveniles in sentencing). Based on this evidence, the Court inferred that “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.” *Graham*, 560 U.S. at 68 (internal quotation marks omitted).

³⁶ *See supra* notes 33-35 and accompanying text (referencing Court’s use of psychological and neuropsychological evidence in expanding juvenile protections).

³⁷ *Miller v. Alabama*, 132 S. Ct. 2455, 2464-65 (2012) (expanding juvenile protections established in *Graham*). In *Miller*, the Court considered the constitutionality of a fourteen year-old’s mandatory life sentence without the possibility of parole for a murder conviction. *Id.* at 2457. In a controversial 5-4 decision, the Court expanded the principle in *Graham*, and concluded that the Eighth Amendment “forbids a sentencing scheme that mandates life in prison without possibility of parole for juvenile [homicide] offenders.” *Id.* at 2469 (quoting *Graham v. Virginia*, 560 U.S. 48, 68 (2010)).

reformed.”³⁸ In a footnote, the Court references the amount of evidence it received by the parties indicating that “the science and social science supporting *Roper*’s and *Graham*’s conclusions have become even stronger.”³⁹ These three cases demonstrate the Court’s continuing trend of limiting juveniles’ culpability due to their limited level of maturity—*Graham* and *Miller* illustrate the Court’s use of neuropsychology in supporting their position.⁴⁰

III. NEUROPSYCHOLOGY’S IMPACT ON A CATEGORICAL RULE

A. Changing the Concepts of Culpability through Neuroscience

The application of psychology to juvenile justice has enabled society and the legal community to examine the particular individual on trial.⁴¹ Today, there remains an open question over how developments in neuroscience can push the analysis a step further by evaluating specific defendants and age echelons as a whole at a biological level using structural and functional images of the brain.⁴² This evaluation is commonly referred to as cognitive neuroscience, a field “that seeks to understand how the mind arises from the central nervous system. . . [bridging] the fields of cognitive science, psychology, and biology by focusing on the biological mechanisms underlying cognition, with a specific focus on the neural substrates of mental processes and their

³⁸ *Id.* at 2465 (internal quotation marks omitted) (applying Court’s use of neuroscience in *Graham* to *Miller*). In *Graham*, the Court also referenced how the qualities of youth, “transient rashness, proclivity for risk, and inability to assess consequences—[decrease] a child’s ‘moral culpability.’” *Id.*

³⁹ *See id.* at 2455, n.5 (quoting two briefs on psychology, neuropsychology, and sociology). The Court quotes one brief, relying on “developmental psychology and neuroscience,” as confirmation of the validity of the Court’s conclusions. *Id.* (quoting Brief for American Psychological Ass’n et al. as Amici Curiae in Support of Petitioner, *Miller v. Alabama*, 132 S. Ct. 2455, 2465 (2012) (Nos. 10-9646, 10-9647), 2012 WL 174239). In giving credence to the neuroscience evidence, the Court also suggested approval of defendant’s brief by quoting “[i]t is increasingly clear that adolescent brains are not yet fully mature in regions and systems related to higher-order executive functions such as impulse control, planning ahead, and risk avoidance.” *See id.*

⁴⁰ *See supra* notes 29-39 and accompanying text (illustrating trend of expanding juvenile protections through neuroscience evidence).

⁴¹ *See supra* Part II.B (explaining evolution and impact of psychology in the courtroom).

⁴² *See* Steven K. Erickson, *Neuroscience: Blaming the Brain*, 11 MINN. J.L. SCI. & TECH. 27, 35 (2010) (explaining birth of neurolaw). NeuroLaw, coined by attorney J. Sherrod Taylor, describes the convergence of neuropsychology and the law. *Id.* Initially, neuropsychology was used as expert testimony in brain-injury civil suits in order to obtain financial rewards, but it has started to impact other areas of the law. *See id.*

behavioral manifestations.”⁴³ The ability of scientists to investigate the structure and functioning of brain activity was greatly enhanced in the 1990s through functional magnetic resonance imaging (fMRI) technology.⁴⁴ In order to understand behavior, cognitive neuroscientists use the activity observed in fMRI data to help explain the individual’s thought process, leading to particular actions.⁴⁵

Over the past few years, neuroscientists have made progress in understanding the adolescent brain.⁴⁶ For instance, they have proven that “many psychiatric disorders, once thought or assumed to be the result of environmental or social factors, are the result of differences in brain structure or function.”⁴⁷ They also proved, based on the neurological data alone, that child and adolescents brain activity are both structurally and functionally different from adults.⁴⁸

⁴³ *Id.* at 42. The premise behind cognitive science is that all thoughts, ideas, feelings, and emotions can be measured by studying the biology of the brain. *See id.* These measurements can then be used in creating models to understand mental activity and predict future behavior. *Id.*

⁴⁴ *See id.* at 42-44. Similar to structural magnetic resonance imaging (MRI), fMRI utilizes a powerful magnetic field to affect water molecules within cells; however, MRI data is only accessible after a person’s death through an autopsy, while fMRI claims to provide these results during the person’s life. *Id.* at 43. Neuroscientists believe that “understanding the complexity of mentation is possible by reducing the operation of the brain to multiple quasi-independent cognitive modules” which can be seen in fMRI data. *Id.* at 44. FMRI technology “creates three-dimensional color images, depicting ‘fluctuations in oxygen concentrations’ in particular regions of the brain. By indirectly measuring local changes in brain activity, ‘fMRI can aid in determining which regions of the brain are recruited in particular cognitive or perceptual tasks.’” *See* Sydney B. Roth, Comment, *The Emergence of Neuroscience Evidence in Louisiana*, 87 TUL. L. REV. 197, 204 (2012).

⁴⁵ *See* Erikson, *supra* note 42, at 45-46 (explaining link between brain activity and behavior). In order to assert these claims, neuroscientists must assume that complex human thought can be reduced to isolated modules found in particular areas of the brain, and employ experiments that manipulate those areas. *See id.* “Determining which areas of the brain are responsible for such higher-ordered, and presumably uniquely human mentation, is largely a matter of reliance on three factors: (1) anecdotal evidence from brain injury victims, (2) observations of people under the effects of psychoactive chemicals, (3) and highly-contrived experiments conducted within the confines of fMRI laboratories.” *Id.* at 46.

⁴⁶ *See* Carl Zimmer, *Secrets of the Brain: New Technologies are Shedding Light on Biology’s Greatest Unsolved Mystery: How the Brain Really Works*, NAT’L GEOGRAPHIC (Feb. 2014), at 28-57 (explaining recent innovations in neuroscience). As neuroscientists are able to manipulate the information uncovered through fMRI, they are able to observe flaws in the brain identifying “differences in the structure of ordinary brains and brains of people with disorders such as schizophrenia, autism, and Alzheimer’s disease.” *Id.* at 38.

⁴⁷ *See* Staci A. Gruber & Deborah A. Yurgelun-Todd, *Neurobiology and the Law: A Role in Juvenile Justice?*, 3 OHIO ST. J. CRIM. L. 321, 331 (2006) (identifying new discoveries through neuroscience).

⁴⁸ *See id.* (“[R]ecent investigations provide evidence that brain maturation continues well past adolescence.”).

These recent advancements in understanding the brain have led to a surge of academic research in this field, leading to what the National Geographic referred to as “one of the great scientific revolutions of our time.”⁴⁹ The United States government has contributed to these efforts by funding a large-scale project to map the neural circuitry of the brain under the Brain Research through Advancing Innovative Neurotechnology (BRAIN) Initiative.⁵⁰ President Obama has publicly endorsed this initiative, referring to it as “the next great American project” and vowed to give “scientists the tools they need to get a dynamic picture of the brain in action.”⁵¹ Paul Allen, co-founder of Microsoft, founded the Allen Institute for Brain Science in 2003 to accelerate the understanding of the human brain and to map the brain’s molecular machinery.⁵² These public and private projects illustrate the broad societal interest in exploring and understanding the inner workings of the brain.⁵³

⁴⁹ See Zimmer, *supra* note 46, at 36 (discussing massive interest and resources pushed towards neuroscience research).

⁵⁰ See John Markoff, *Obama Seeking to Boost Study of Human Brain*, N.Y. TIMES (February 17, 2013), available at http://www.nytimes.com/2013/02/18/science/project-seeks-to-build-map-of-human-brain.html?pagewanted=all&module=Search&mbReward=relbias%3As&_r=0 (explaining goals behind initiative). In his 2013 State of the Union, President Obama announced, “scientists are mapping the human brain to . . . unlock the answers to Alzheimer’s. They’re developing drugs to regenerate damaged organs Now is not the time to gut these job-creating investments in science and innovation.” *Id.*

⁵¹ Zimmer, *supra* note 46, at 38 (quoting President Obama’s support for the BRAIN initiative); see William J. Broad, *Billionaires with Big Ideas are Privatizing American Science*, N.Y. TIMES (Mar. 15, 2014), available at <http://www.nytimes.com/2014/03/16/science/billionaires-with-big-ideas-are-privatizing-american-science.html> (quoting President Obama on BRAIN initiative). President Obama has pledged \$100 million in federal funds for this project. Broad, *supra*.

⁵² See Zimmer, *supra* note 46, at 42 (explaining private investment in neuroscience research); see also *Founders*, ALLEN INST. FOR BRAIN SCIENCE, <http://www.alleninstitute.org/our-institute/founders/> (explaining history and purpose behind Allen Institute for Brain Science). In addition to Paul Allen donating \$500 million to this cause through the Allen Institute, other private investors are getting involved. See Zimmer, *supra* note 46, at 42. For example, technology and real estate billionaire Fred Kavli established brain institutes at Yale, Columbia, and the University of California. See *id.* (illustrating extent of private investments in brain research).

⁵³ See *supra* notes 49-52 and accompanying text (demonstrating recent governmental and private investments in brain research). These initiatives are not limited to academic and medical discovery. See Francis X. Shen, *The Law and Neuroscience Bibliography: Navigating the Emerging Field of Neurolaw*, 38 INT’L J. LEGAL INFO. 352, 357 (2010) (reporting growth of neuroscience and legal scholarship). In 2007, the MacArthur foundation invested \$10 million to begin the Law and Neuroscience Project. See *id.* The intersection of neuroscience and the law has appeared on the cover of Time Magazine and was identified “by the preeminent scientific journal *Science* as one of the top seven topics to watch in 2009.” *Id.* at 358; see THE MACARTHUR FOUNDATION RESEARCH NETWORK ON LAW AND NEUROSCIENCE, <http://www.lawneuro.org/> (last visited October 13, 2014) (detailing past and current

Although recent advancements in neuroscience may offer a gateway to understanding the inner workings of the brain, neuroscience as a field is still in its infancy and some remain skeptical of the validity both of its conclusions and practical application in the courtroom.⁵⁴ Stephen Morse, the associate director at the Center for Neuroscience and Society at the University of Pennsylvania Law School argues, “at present, neuroscience has little to contribute to more just and accurate criminal law decision-making about policy, doctrine, and individual case adjudication.”⁵⁵ The jury is still out on whether the neuroscience evidence at present is sufficient to question long held beliefs in the legal system; but there is no question that the more highly developed and robust the neuroscience literature becomes, the more lawyers will make compelling arguments forcing courts to confront increasingly difficult questions.⁵⁶

B. Blurring the Legal Line Between Juveniles and Adults

The Court’s emphasis on concepts supporting leniency for juveniles introduced in *Roper*, and expanded on in *Graham* and *Miller*, have allowed lawyers to argue that those principles should apply to individuals in early adulthood.⁵⁷ In *United States v. C.R.*, the U.S. District

advancements in neurolaw).

⁵⁴ See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 592-94 (evaluating expert scientific testimony’s applicability in the courtroom); Stephen J. Morse, *NeuroLawExuberance: A Plea for Neuromodesty*, in *TECHNOLOGIES ON THE STAND: LEGAL AND ETHICAL QUESTIONS IN NEUROSCIENCE AND ROBOTICS* 23, 32 (Bibi van den Berg & Laura Kleming eds., 2011) [hereinafter *A Plea*] (claiming irrational exuberance regarding neuroscience on law). In the absence of additional science, fMRI imposes two major assumptions: “[f]irst, since there are no definitive or universal rules about how the brain becomes the mind, fMRI utilizes technologically convenient assumptions about brain function to arrive at its end product. Second, there are no alternative mechanisms equivalent to autopsy dissection to validate the findings of fMRI.” Erickson, *supra* note 42, at 43-44.

⁵⁵ See *Mind of a Child*, *supra* note 31, at 39. According to Morse, “[p]olicy and adjudication should not be influenced by findings that are insufficiently established and replications of findings are crucial to our confidence in a result.” *Id.* at 33. However, Morse acknowledges the potential for the future of neuroscience, stating that “as the philosophy of mind and action and neuroscience mutually mature and inform each other, neuroscience will help us understand criminal behavior.” *Id.* at 39.

⁵⁶ See Roth, *supra* note 44, at 202; see also *State v. Stanko*, 658 S.E.2d. 94, 97-98 (S.C. 2008) (introducing PET and Brain Morphological Analysis evidence to establish issues of guilt, innocence, and psychopathy). Due to the rapid “advances in the field of neuroscience, scientists are now able to provide better explanations for the biological mechanisms responsible for . . . emotions, decision making, violence and aggression, mental capacity, mental illness, and a host of other behaviors and subjective mental states that were once only appreciated through esoteric theorizing.” Roth, *supra* note 44, at 202 (internal quotation marks omitted).

⁵⁷ See *supra* Part II.B (explaining rationale behind Court’s decisions in *Roper*, *Graham*, and

Court for the Eastern District of New York sentenced a nineteen year-old defendant to half the statutory minimum after pleading guilty to receiving and distributing child pornography on the Internet.⁵⁸ The district court's decision was largely dependent on the Supreme Court's rationale in *Graham*, holding that a term of five years in federal prison under the sentencing requirements for this particular defendant would constitute cruel and unusual punishment in violation of the Eighth Amendment.⁵⁹

In deciding to cut the statutory minimum in half, the district court heard from a number of experts, evaluated psychological, behavioral, and neuropsychological evidence, and even visited the Federal Medical Center,

Miller); see also *infra* notes 62-70 and accompanying text (explaining district court's application of Eighth Amendment to nineteen year-olds).

⁵⁸ *United States v. C.R.*, 792 F. Supp. 2d 343, 519-20 (E.D.N.Y. 2011) (finding five-year mandatory minimum sentence to be unconstitutional). Although the Supreme Court's rationale was initially presented in *Roper*, the district court in *C.R.* focused on *Graham* because the defendant in *Roper* was facing the death penalty. See *id.* It is also important to point out that *Miller* had not been decided at the time of *C.R.* See *Miller v. Alabama*, 132 S. Ct. 2455 (2012) (prohibiting juvenile sentence to life in prison without parole for murder conviction). In *C.R.*, the defendant was introduced to child pornography at age fifteen. See *C.R.*, 792 F. Supp. 2d at 347. Over the next three years, he "collected more than a thousand child pornographic still images and over a hundred such videos, in addition to substantial adult pornography." *Id.* at 350-51. The defendant was nineteen at the time of the offense and pled guilty to distributing a video that contained child pornography in violation of 18 U.S.C. § 2252(a)(2). See *id.* at 347 (requiring sentence based on statutory minimum of five years). The court ultimately imposed a thirty-month sentence for intensive medical treatment while in prison, followed by a long-term curative therapy and many years probation. *Id.* at 347-48.

⁵⁹ *Graham v. Florida*, 560 U.S. 48 (2010) (acknowledging immaturity as factor in sentencing); *C.R.*, 792 F. Supp. 2d. at 496 (relying on defendant's age and immaturity in mitigation). The district court held that

testimony and other evidence at [the defendant's] sentencing hearing as well as consensus and other ruling criteria supports the conclusion that at the time of the crime he was, and should be characterized for sentencing as, a developmentally immature young adult with limited ability to appreciate legal limits on contacts with child pornography and to control his viewing of easily accessible internet programs.

C.R., 792 F. Supp. 2d. at 506. Relying heavily on the Supreme Court's distinction between the culpability of juveniles and adults in *Graham*, the court found the minimum statutory sentence grossly disproportionate, and thus violated the Eighth Amendment. See *id.* at 496 ("The *Graham* court went on to explain that "[a] juvenile is not absolved of responsibility for his actions, but his transgression 'is not as morally reprehensible as that of an adult..."). The *C.R.* court also points out how the statutory minimum guidelines for possession and distribution of child pornography vary among states, but on average are much less harsh than the five years imposed by the federal sentencing guidelines. *Id.* at 493. A large proportion of federal judges view the sentencing guidelines for possession and receipt of child pornography as unreasonably harsh. *Id.* at 481; see *infra* note 98 and accompanying text (explaining Sentencing Commission's report on controversies surrounding harsh child pornography sentences).

before ultimately deciding the nineteen year-old defendant's sentence.⁶⁰ The district court's first line of scientific support for the immaturity exception cites "[p]sychology and brain imaging studies" to demonstrate the importance of neuroscience in uncovering the fundamental differences between "adolescents and adult minds."⁶¹ Dr. William Barr conducted a neuropsychological test to "obtain a comprehensive profile of [the defendant's] current cognitive functioning," concluding there was "no inherent defect inhibiting him from success in a community setting."⁶² Along with Dr. Barr's report, Dr. Laurence Steinberg presented general scientific principles of brain development to the defendant's situation.⁶³ Dr. Steinberg's testimony fully corroborated the neuroscience reports that were used by the Supreme Court in *Roper* and *Graham*, but in this case he was testifying as to how these biological changes are still occurring in a nineteen year-old.⁶⁴ Along with the district court's references to *Roper* and

⁶⁰ See *C.R.*, 792 F.Supp.2d at 496-07 (highlighting court's expansive use of expert testimony). The district court included the defendant's mental health evaluations that were conducted following his arrest at the direction of Pre-trial Services. *Id.* at 408-18.

⁶¹ *Id.* at 497 (providing scientific information supporting immaturity exception). The court cites briefs presented to the Supreme Court in *Graham* that "[s]tructural differences between adolescent and adult brains, confirmed by recently developed brain imagery technology, demonstrate that critical regions of the brain ... continue to develop through age 25." *Id.* at 499; see *supra* notes 33-**Error! Bookmark not defined.** and accompanying text (explaining Court's use of neuroscience evidence in *Graham*).

⁶² *C.R.*, 792 F. Supp. 2d at 412-15 (comparing defendant's cognitive functioning to what is considered normal). Dr. Barr's evaluation indicated that the defendant's "level of intellectual functioning is in the 'high average' range." *Id.* at 412 (concluding defendant is no different than a typical nineteen-year old). In fact, Dr. Barr testified, "[t]here is also no evidence from the current testing or past records to indicate that, at the time of the alleged offenses, [the defendant] differed from any other males from his age group in terms of his decision-making capacity or in his ability to control impulses." *Id.* at 413 (demonstrating defendant was not unique from neurological standpoint).

⁶³ See *id.* at 502 (testifying to general principles accepted within neuroscience). Dr. Laurence Steinberg was the chief scientist for the American Psychological Association, helping the Association's counsel prepare the amicus briefs in *Roper* and *Graham*. *Id.* In acknowledging consensus within the neuroscience community, Dr. Steinberg stated, "we know that there's structural brain change after the age of 18 both in gray matter and in white matter, and we also know that there's function in the brain after 18 in terms of differences in patterns of brain activity that you see among people of different ages." *Id.* at 503. Dr. Steinberg explicitly disagreed with Dr. Barr's assessment that there is a cutoff period of adolescence at age eighteen. *Id.* at 502-03.

⁶⁴ See *id.* at 503-04 ("[R]egions of the brain that are important for things like thinking ahead and planning and impulse control and weighing risks and rewards, those regions and systems of the brain are still developing after age 19."). In fact, based on his research, Dr. Steinberg explained how the characteristics of the executive functions of the brain, specifically "impulse control," are still developing into the mid-twenties. See *id.* at 504. Therefore, "a cognitively normal 19-year-old would be more apt to behave impulsively than a typical 25-year-old, let's say, as a point of comparison." *Id.* Steinberg continued describing what his research has shown and even includes how his research supports psychologists and sociologists Age Crime Curve theory.

Graham for support, it took the Supreme Court's decisions a step further by concluding that based upon the scientific evidence presented, the Eighth Amendment provides protections to individuals over the age of eighteen.⁶⁵

The government appealed the district court's decision and the Second Circuit provided a much different perspective on *Roper* and *Graham's* application to the case.⁶⁶ The Second Circuit emphasized that the defendant was already nineteen when he committed the crime; therefore, "he was an adult, not a juvenile."⁶⁷ It further expounded that the Supreme Court's decision in *Roper* and *Graham* concerned juveniles; the district court's attempt to "blur the distinction between juvenile and adult offenders" does not make a nineteen year-old a juvenile simply because he is "developmentally immature."⁶⁸ Although the Second Circuit devoted the majority of its opinion to discussing the rigid application of mandatory minimums, it noted "immaturity, unlike age, is a subjective criterion, ill-

See id. at 505 ("The Age Crime Curve . . . shows that misbehavior of almost every sort increases from age 10 or so on and peaks around 17 or 18 and then declines. . . . [i]t's likely to be the case that decline is related to improvements in self-regulation and in the maturation of self-control."). Steinberg supports his psychosocial observations with neurological evidence, inferring that the increase of impulse control and weighing future consequences as an individual's age is due to "maturation of the prefrontal lobe both in synaptic pruning and myelination and the development of stronger connections between cortical and subcortical regions." *See id.* at 505-06.

⁶⁵ *See id.* at 497. After considering the entirety of expert testimony, the district court concluded, "[w]hile 18 may be the point where society draws the line for many purposes between childhood and adulthood, scientific developments conclude that full adulthood is not biologically achieved until much later in life than age 18." *Id.* at 497 (internal quotation marks omitted). Finally, the court notes that the defendant committed the crimes "during a state of adolescent development that neuropsychological research has found to have significant implications for insight, decision making, judgment, risk taking behavior, and, ultimately, culpability. This research weighs heavily in the court's determination that the five-year mandatory minimum sentence is unconstitutional as applied." *Id.* at 507 (concluding five-year mandatory minimum sentence violated the Eighth Amendment).

⁶⁶ *United States v. Reingold*, 731 F.3d 204, 230-31 (2d Cir. 2013) (reversing district court's decision in favor of mandatory minimum).

⁶⁷ *See id.* at 215 (pointing solely to defendant's age to assign him adult status). The Second Circuit easily distinguished this case from the Supreme Court's decisions in *Roper* and *Graham* because unlike those cases, the defendant was nineteen years-old at the time of the alleged offense. *See id.* (imposing mandatory minimum five-year sentence given legal adult status); *see also* 18 U.S.C. § 2252(a)(2) (2012) (defining mandatory five-year minimum sentence for knowingly receiving or distributing child pornography).

⁶⁸ *Reingold*, 731 F.3d at 215 (discussing district court's misapplication of *Roper* and *Graham*). The Second Circuit asserts "the Court used [age 18] to distinguish the class of offenders that categorically could not be sentenced to death from others to whom no such categorical prohibition would apply." *Id.* Therefore, if the Court wished to extend the impact of *Graham* and *Roper* to individuals over the age of eighteen, it would not have used the term juveniles. *Id.*

suited to the pronouncement of categorical rules.”⁶⁹ In considering the district court’s rationale and the Supreme Court’s guidance on sentencing juveniles, the Second Circuit concluded that although the defendant may not have been a fully developed adult, “a line must be drawn to pronounce a categorical rule . . . because [t]he age of 18 is the point where society draws the line for many purposes between childhood and adulthood . . . the district court could not substitute the defendant’s relative immaturity for [his] actual age.”⁷⁰ The Second Circuit’s ultimate conclusion, preferring the age where society has drawn the line between juveniles and adults over the criteria presented by psychologists and neuropsychologists, may encourage the legal community to consider this question and potentially open the door for reevaluating the most appropriate guidelines in sentencing individuals that have recently entered adulthood.⁷¹

IV. SENTENCING POLICY FOR YOUNG ADULTS IN THE TWENTY-FIRST CENTURY

Sentencing policy for individuals under eighteen years old has come a long way in the past century due to social initiatives and

⁶⁹ See *id.* at 215-21 (discussing amount of deference given to legislature in defining mandatory minimums). Due to each sentence being “a function of both the crime committed and the character of the defendant who committed it, Congress decided . . . the distribution of child pornography was a sufficiently serious crime as to require at least a five-year sentence even for the most sympathetic defendant.” *Id.* at 220. In fact, the Second Circuit includes a lengthy discussion on why a five-year minimum sentence is appropriate for conviction of this offense. See *id.* at 218-30 (noting difficulty in preventing child pornography). In 2003, Congress established a five-year minimum prison term for knowing receipt or distribution of child pornography with the objective of drying up this market through severe criminal penalties. *Id.* at 218-19. In evaluating mandatory minimums defined by Congress, the Supreme Court has stated that it “never invalidated a penalty mandated by a legislature based only on the length of sentence . . . we should only do so in the most extreme circumstance.” *Id.* at 220 (quoting *Harmelin v. Michigan*, 501 U.S. 957, 1006 (1991)). Although “[a]n adult defendant’s immaturity may mitigate his moral culpability . . . it does not reduce the harmful effects of his crime.” *Id.* at 221. The Second Circuit also points to the Supreme Court’s guidance in *Harmelin v. Michigan*, holding that the Eighth Amendment’s proportionality analysis should be “informed by objective factors to the maximum possible extent.” *Id.* at 215; see *Harmelin v. Michigan*, 501 U.S. 957, 1000 (1991) (applying Eighth Amendment’s proportionality review).

⁷⁰ *Reingold*, 731 F.3d at 215 (internal quotation marks omitted) (defining traditional standard applied for differentiating between juveniles and adults). The Second Circuit highlighted the fact that the experts that testified in the evidentiary hearing seemed to contradict each other. See *id.* (“Nowhere does the record reveal any consensus about how immature adults should be sentenced for child pornography crimes.”).

⁷¹ See *supra* notes 60-70 and accompanying text (presenting district and circuit court arguments).

advancements in psychology.⁷² With rapid expansions and complements in neuropsychology, has the field of psychology progressed to a level where it can redefine the legal distinction between juveniles and adults?⁷³ The district court's decision to sentence a nineteen-year old below the mandated minimum appears premature when taking into account the relatively new developments in neuropsychology.⁷⁴ On the other hand, the Second Circuit's decision fails to adequately address the hundred pages of expert testimony of psychologists and neuropsychologists included in the district court's opinion detailing actual developments in those fields.⁷⁵ The question the legal community must ask itself is how these recent developments in neuropsychology should be applied to the legal system in finding the most appropriate distinction between sentencing juveniles and adults.⁷⁶

A. Should the Supreme Court Decide United States v. Reingold?

In the unlikely event the Supreme Court grants certiorari to *U.S. v.*

⁷² See *supra* Part II (detailing developments in juvenile justice over past one hundred years).

⁷³ See *supra* Part III (discussing current state of neuropsychology and its potential impact on juvenile justice).

⁷⁴ See *supra* Part III.A (discussing current state of neuropsychology). The breakthrough advancements in neuroscience, specifically the ability to evaluate brain activity through fMRI, were only developed within the past twenty-years. See *supra* notes 42-**Error! Bookmark not defined.** and accompanying text (explaining recent progress in neuroscience through fMRI).

⁷⁵ See *supra* notes 68-70 and accompanying text (discussing Second Circuit's rejection of subjective nature of immaturity in favor of categorical rules); see also *United States v. C.R.*, 792 F. Supp. 2d 343, 408-508 (E.D.N.Y. 2011) (recording hundred pages of psychologist and neuropsychologist testimony). Although the Second Circuit acknowledges the district court's argument, it appears to reject the scientific evidence due to its complex and problematic application, favoring "[t]he age of 18 [because it] is the point where society draws the line for many purposes between childhood and adulthood." See *Reingold*, 731 F.3d at 215 (2013) (preferring society's definition of adult over expert testimony).

⁷⁶ See *infra* Part IV.B. The issue of expanding the arguments in *Roper* and *Graham* has already been raised in other jurisdictions. See *Wilcox v. Rozum*, No. 13-3761, 2013 U.S. Dist. LEXIS 179479 (E.D. Pa. Dec. 20, 2013) (arguing for application of principles in *Miller* to eighteen-year old); *Ocampo v. Fisher*, No. 13-3569, 2013 U.S. Dist. LEXIS 150153 (E.D. Pa. Sept. 23, 2013) (arguing life sentence violates Eighth Amendment rights of eighteen-year olds after *Miller*). In *Wilcox v. Rozum*, the defendant was given a mandatory life sentence after being convicted of second-degree murder seven months after his eighteenth birthday. *Wilcox*, 2013 U.S. Dist. LEXIS 179479, at *3. In a writ of habeas corpus, the petitioner argued "although *Miller v. Alabama* dealt specifically with defendants who were under the age of eighteen...the decision should apply to any individual who was between the ages of eighteen and twenty-five...because the decision shows that a child's biological process is not typically complete until he reaches his mid-twenties." *Id.* In each of these cases, the court has ruled that the principles outlined in *Roper*, *Graham*, and *Miller* only apply to individuals under the age of eighteen. See *id.* at *3-4; *Ocampo*, 2013 U.S. Dist. LEXIS at *8-9.

Reingold, there is little doubt that it would affirm the decision of the Second Circuit.⁷⁷ The district court's decision that sentencing the defendant to five-years in federal prison would constitute cruel and unusual punishment is unlikely to persuade the Supreme Court to go outside the mandatory minimum for two reasons: (1) although the facts of this case are unique, there is nothing specific to the defendant's fMRI scans or neurological data that proves he is less mature than the average person; and (2) neuropsychologists seem to lack universal consensus on what precisely defines the maturity level of a nineteen-year old.⁷⁸ With respect to the first point, the most influential testimony in *United States v. C.R.* pertained to the general neuroscience information suggesting that the brain is still maturing for *most of the population*, between the ages of eighteen to twenty-five.⁷⁹ The defendant demonstrated no signs of immaturity in terms of brain development; therefore, the impact of this decision would likely establish a precedent questioning the level of culpability between juveniles and adults for any crime; the immediate result of which would be opening the doors to endless litigation for anyone under the age of twenty-five to argue that they should not be considered an adult for sentencing purposes.⁸⁰

Further, the Supreme Court is unlikely to accept the district court's argument is that neuroscience is still a relatively young field and has yet to be meaningfully considered as an impetus for systematic change in the

⁷⁷ See *infra* notes 83-90 (outlining reasons Supreme Court would not grant *Reingold* certiorari). Congressionally approved mandatory minimums are controversial throughout the legal community because of the deference they are given by appellate courts. See *supra* notes 73-74 (explaining strict enforcement of mandatory minimums); see also *Solem v. Helm*, 463 U.S. 277, 290 (1983) ("Reviewing courts...should grant substantial deference to the broad authority that legislatures necessarily possess in determining the types and limits of punishments for crime.").

⁷⁸ See *Zimmer*, *supra* note 46 (comparing defendant's cognitive functioning with average person's brain); see also *Gruber*, *supra* note 47, 95 (discussing disagreement between two neurologists testifying at defendant's sentencing hearing).

⁷⁹ See *supra* notes 46-47 and accompanying text (discussing general principles accepted in neuroscience). During the sentencing hearing, Dr. Barr concluded "[t]here is no evidence from objective testing or available records to indicate any underlying neuropsychological deficit or weakness in impulse control, decision-making, or planning relative to others in [defendant's] age group that would have affected his behavior at the time of the alleged sexual offenses." *United States v. C.R.*, 792 F. Supp. 2d 343, 414. Dr. Steinberg did not specifically evaluate the defendant, but rather was asked to testify to "general scientific principles of adolescent brain development." *Id.* at 502.

⁸⁰ See *supra* note 76 (explaining attorneys' attempts to extend the Court's ruling in *Roper*, *Graham*, and *Miller*). Expanding the Eighth Amendment under these circumstances would have broad implications because the district court's decision was not focused on the particular circumstances surrounding the defendant's maturity level, rather it was on the average person between the ages of eighteen and twenty-five. *C.R.*, 792 F. Supp. 2d at 519.

legal system.⁸¹ Such a revolutionary concept needs to be thoroughly evaluated and clearly defined before the Supreme Court would make a decision that departs from congressionally defined mandatory minimums and challenges the long established practice of sentencing an eighteen-year old as an adult.⁸² However, this is not to say that questioning the distinction between juveniles and adults through scientific research lacks merit; in fact, over the past few years neuroscience has made rapid developments and begun playing a more central role in how courts evaluate human behavior.⁸³ Although a Supreme Court ruling may not be the appropriate mechanism to define new standards based on the particular facts of *Reingold*, the question is still left unresolved: what is the most appropriate sentencing policy for individuals between eighteen and twenty-five years old, and should it be governed by the traditional standard or be revised to incorporate advancements in psychology and neuropsychology?⁸⁴ To answer this question, the legal community should adopt a similar approach to the one adopted in 1923, and look to an independent agency within the judicial branch that was specifically created to evaluate and make recommendations on the most appropriate sentencing policy—the United States Sentencing Commission.⁸⁵

⁸¹ See *supra* notes 47-52 and accompanying text (explaining current assumptions necessary to draw conclusions in neuroscience); see also notes 62-65 (showing two neuroscience experts disagreeing on cutoff age of adolescents).

⁸² See *supra* notes 66-70 and accompanying text (presenting Second Circuit's reasoning for rejecting district court's argument in favor of traditional standards). Besides more of the population understanding and accepting the field of neuroscience, it is critical for the experts to specify what terms are being used to evaluate the culpability of a legal adult; for instance, are we examining adolescence, maturity, brain development, or psychological development? See *C.R.*, 792 F. Supp. 2d at 502. For example, when the court asked Dr. Steinberg to define adolescence, he separated an individual's "development" into two parts: "[i]f you were doing it in terms of brain development, I would say probably from about 10 to 24 If you were talking about psychological development, I would say maybe from 10 to 20 [or] 10 to 21." *Id.* Therefore, it is imperative to define how the courts should evaluate a person's maturity level or developmental level in recommending an appropriate sentence. See *id.*

⁸³ See *supra* note 76 (providing examples of cases utilizing arguments in *Graham* and *Miller*). According to Nita Farahany, a bioethicist at Duke University, who has been following the increase of neuroscience evidence in the United States, "the number of judicial opinions mentioning neuroscience evidence tripled between 2005 and 2011, from roughly 100 to more than 300." Greg Miller, *Neuroscience is Getting Its Day in Court Whether It's Ready or Not*, WIRED (Dec. 16, 2013), <http://www.wired.com/wiredscience/2013/12/brain-science-law/>.

⁸⁴ See *supra* notes 78-82 and accompanying text (identifying reasons why Supreme Court is unlikely to confront this particular question).

⁸⁵ See *An Overview of the United States Sentencing Commission*, U.S. SENTENCING COMMISSION 1, http://www.ussc.gov/sites/default/files/pdf/about/overview/USSC_Overview.pdf (last visited November 14, 2014) [hereinafter *Commission Overview*] (outlining history and purpose of Sentencing Commission). In 1984, Congress passed the Sentencing Reform Act,

B. The Sentencing Commission's Role in the Next Phase of Juvenile Justice

The United States Sentencing Commission (“the Commission”) has the responsibility of evaluating the effects of Sentencing Guidelines within the legal system, recommending to Congress appropriate modifications of substantive criminal law and sentencing procedures, and establishing a research and development program on sentencing issues.⁸⁶ The Sentencing Guidelines [the Guidelines] produced by the Commission are designed to: “(1) incorporate the purposes of sentencing; (2) provide certainty and fairness in meeting the purposes of sentencing by avoiding unwarranted disparity among offenders with similar characteristics convicted of similar criminal conduct. . .and (3) reflect. . .advancement in the knowledge of human behavior as it relates to the criminal justice process.”⁸⁷ Although each of these objectives is applicable in some way to the sentencing issues presented in *United States v. Reingold*, the third objective of the Guidelines produced by the Commission is the most pertinent: to “reflect, to the extent practicable, advancement in the knowledge of human behavior.”⁸⁸ To

which created the United States Sentencing Commission. *See id.* at 3. Congress established the Sentencing Commission as an ongoing, independent agency to evaluate sentencing guidelines and procedures. *See id.* The President appoints the seven voting members on the Sentencing Commission, most of whom are federal judges, and once confirmed by the Senate, each member serves a six-year term. *See id.*

⁸⁶ *See id.* at 1-3 (explaining background of Commission). The Sentencing Commission was instructed to “periodically . . . review and revise [the guidelines] in consideration of comments and data.” *Id.* at 4 (internal quotation marks and citation omitted). The Commission consults a diverse range of agencies in promulgating federal sentencing policy, such as the United States Probation System, the Bureau of Prisons, the Judicial Conference of the United States, the Criminal Division of the United States Department of Justice, and representatives of the Federal Public Defenders. *C.R.*, 792 F. Supp. 2d at 477.

⁸⁷ *Commission Overview*, *supra* note 85, at 1. Over the past thirty-five years, judicial discretion has been curtailed through legislative intervention. *See* Michael Fisher, *Striking a Balance: The Need to Temper Judicial Discretion Against a Background of Legislative Interest in Federal Sentencing*, 46 DUQ. L. REV. 65, 66 (2007) (questioning legitimacy of certain mandatory minimum sentences). Along with providing recommendations to Congress, the Commission created the Guidelines. *Id.* at 70. The Guidelines establish a base sentencing term period for each crime in the federal U.S. Code, upon which an offender’s sentence is calculated based on a number of factors, including: the impact on the victim, the nature of the offender, his role in the offense, any subsequent conduct on his part, and his past criminal history. *Id.* at 71. Unlike the mandated minimums, however, sentencing judges are only required to consider the Guidelines in sentencing hearings; they are not obligated to impose a sentence based on the Guidelines. *See* *United States v. Booker*, 543 U.S. 220, 259-60 (2005) (declaring sentencing guidelines discretionary rather than mandatory).

⁸⁸ *See Commission Overview*, *supra* note 85, at 1; *see also supra* Part III.A (discussing advancements in neuroscience explaining human behavior). In *C.R.*, the district court heard experts offer neuroscience testimony that fundamentally questioned our assumptions about human behavior. *See C.R.*, 792 F. Supp. 2d at 502; *see also supra* notes 61-64 and accompanying

satisfy its primary objective of recommending the most appropriate sentencing policy, the Commission should conduct a comprehensive assessment of current evidence in the fields of psychology and neuropsychology which implicates individuals eighteen or older.⁸⁹

The Commission has conducted similarly comprehensive studies in the past; two reports in particular address central concerns discussed by the district court in *United States v. C.R.*⁹⁰ In October 2011, the Commission prepared a report, pursuant to a congressional directive, assessing the impact of mandatory minimum penalties on federal sentencing.⁹¹ In evaluating mandatory minimum penalties, the Commission “reviewed legislation, analyzed sentencing data . . . studied scholarly literature, consulted with its advisory groups . . . and heard from social scientists, scholars, and others who apply or study mandatory minimum sentencing provisions.”⁹² In December 2012, the Commission independently initiated

text (explaining how monitoring brain activity helps explain impulse control in eighteen to twenty-five year olds).

⁸⁹ See *C.R.*, 792 F. Supp. 2d at 484-87 (explaining comprehensive study on controversial mandatory minimums conducted by Sentencing Commission). One of the primary goals in establishing the Sentencing Commission was to ensure a certain level of continuity and consistency in similar offenses within the legal system. See Fisher, *supra* note 87, at 68-69 (discussing goals of sentencing reform). The issue between the district court and the Second Circuit in *Reingold*, demonstrates a dispute that will only become more exhausted as neuroscience technology develops. See *supra* notes 57-66 and accompanying text (explaining approach taken by each court in defining adults). The United States Sentencing Commission has conducted comprehensive studies in the past, to evaluate sentencing. See Erik Luna & Paul G. Cassell, *Mandatory Minimalism*, 32 CARDOZO L. REV. 1, 3-4 (2010) (illustrating Commission’s purpose in conducting comprehensive evaluations of sentencing policy). When Attorney General Eric Holder created a working group in 2010 to evaluate federal sentencing policy, Congress immediately “directed the U.S. Sentencing Commission to submit a comprehensive report on mandatory minimums . . .” *Id.* at 4.

⁹⁰ See *C.R.*, 792 F. Supp. 2d at 478-84 (discussing controversial nature of mandatory minimums and harsh child pornography sentences); see also *Commission Overview*, *supra* note 85 (listing recent testimony, reports, and submissions by Commission).

⁹¹ See U.S. SENTENCING COMMISSION, REPORT TO THE CONGRESS: MANDATORY MINIMUM PENALTIES IN THE FEDERAL CRIMINAL JUSTICE SYSTEM (2011), available at <http://www.ussc.gov/news/congressional-testimony-and-reports/mandatory-minimum-penalties/report-congress-mandatory-minimum-penalties-federal-criminal-justice-system> [hereinafter *Mandatory Minimum Penalties*] (providing Commission’s findings reported to Congress).

⁹² See *id.* at xxv (Executive Summary) (providing Commission’s overall conclusions and recommendations). The Commission’s report involved a detailed empirical study involving 73,239 cases from 2010, breaking down the impact of mandatory minimums by race, gender, citizenship, criminal offense, rates of relief from mandatory minimums, and relief rates due to defendants assisting the prosecution. See *id.* at xxvii (Executive Summary) (illustrating impact of mandatory minimums on all demographics). By conducting such an expansive review, approximately 370 pages not including the ten appendices, the Commission illustrated the discrepancies and inconsistencies surrounding the current policy and provided Congress general

another comprehensive report examining federal sentencing policy in child pornography cases.⁹³ This study highlights the impact of recent technological advancements that have completely changed the ways in which individuals “receive” child pornography, and how these advancements drastically affect the current sentencing policy.⁹⁴ These Commission Reports provide in-depth analysis on the most controversial legal issues conducted by a few of the most experienced and respected judicial minds in the country – the advancements in psychology and neuropsychology that question the distinction between juveniles and young adults deserves their attention.⁹⁵

In evaluating sentencing policy for young adults, the Commission should begin their report with a similar approach as the Mandated Minimums Report: studying scholarly literature; analyzing sentencing data from individuals eighteen years old to those in their early twenties; and hearing from experts in sociology, psychology, neuropsychology, and neuroscience.⁹⁶ After outlining the current state of psychology and neuropsychology, the Commission should apply its findings to the current sentencing policy, as it did in the Federal Sentencing in Child Pornography

and specific recommendations for moving forward. *See id.* at 345-48 (Chapter 12) (presenting Commission’s general conclusions and recommendations).

⁹³ *See* U.S. SENTENCING COMMISSION, REPORT TO THE CONGRESS: FEDERAL CHILD PORNOGRAPHY OFFENSES (2012), [hereinafter *Federal Child Pornography Offenses*] available at http://www.ussc.gov/Legislative_and_Public_Affairs/Congressional_Testimony_and_Reports/Sex_Offense_Topics/201212_Federal_Child_Pornography_Offenses/Full_Report_to_Congress.pdf (outlining the Commission’s full report to Congress). This study cites neuroscience experts in discussing the potential treatment available to individuals who view child pornography. *See id.* at 278-79 (Chapter 10) (referencing neuroscience experts in two footnotes). This report cites *United States v. C.R.* on seven separate occasions to illustrate the complexities involved in sentencing child pornography defendants. *See id.* at 13, 16, 171, 173, 272, 286, 289 (Chapters 1, 7, 10) (presenting problems that arise in applying outdated sentencing policy).

⁹⁴ *See id.* at 1-3 (Chapter 1) (outlining purposes and methodology used by Commission). The Commission points to the concerns voiced by “a number of stakeholders in the federal criminal justice system . . . to revise the sentencing scheme to reflect both the recent evolution of offense conduct brought about by technological changes and also emerging social science research . . .” *See id.* at 3. Upon presenting their findings, the Commission ultimately concluded that the sentencing scheme needed to be updated in order “to better reflect the technological changes and new expert knowledge and also to account for current offenders’ varying degrees of culpability and dangerousness.” *See id.*

⁹⁵ *See supra* Part IV.A (identifying issue’s unique circumstances making it difficult for Supreme Court to make ruling); *see also* Shen, *supra* note 57, at 361 (“[T]he ‘legal system’ spans beyond courtrooms, and . . . much of the work to be done happen[s] in Congress, state legislatures and administrative agencies. . .”).

⁹⁶ *See supra* notes 91-92 and accompanying text (addressing amount of resources consulted by Commission in Mandatory Minimums Report).

Cases.⁹⁷ If the Commission concludes, as it did in that report, that the current sentencing policy is outdated and needs to “better reflect the technological changes and new expert knowledge,” it should make recommendations to Congress and make revisions to its Guidelines.⁹⁸ On the other hand, if the Commission concludes that the evidence presented by psychologists and neuropsychologists is not at a level to justify rejecting the traditional adult age of eighteen, or restricting its use in mitigation, the report still provides guidance to practicing attorneys and judges when hearing these arguments.⁹⁹ The advancements in neuroscience have already begun impacting different areas of the law, and its expanded use is extremely likely.¹⁰⁰ The Commission’s report would provide specific guidance to Congress, as well as state and federal courts on how neuropsychology has impacted the debate over the culpability of a young adult; in doing so, the Commission’s findings would also provide the beginning of a broader debate over where neuroscience fits into evaluating a defendant’s conduct within the legal system.¹⁰¹

⁹⁷ See *Federal Child Pornography Offenses*, at 330-31 (Chapter 12) (presenting overall conclusion and recommendations); see also *supra* notes 93-94 and accompanying text (explaining Commission’s approach in evaluating current child pornography sentences). The Commission presented a comprehensive report to Congress on an outdated policy that only affected one area of criminal conduct. See *supra* notes 93-94. If the Commission was willing to spend that much time on an outdated policy that only affects one offense, it should be willing to conduct a similar report on an area of law that would affect every congressional mandatory minimum. See *supra* notes 93-94.

⁹⁸ See *supra* notes 93-94 and accompanying text (citing Commission’s child pornography sentencing findings); see also Rebecca Krauss, *Neuroscience and Institutional Choice in Federal Sentencing Law*, 120 YALE L.J. 367, 375 (2010) (explaining how neuroscience evidence could better inform Commission Guidelines).

⁹⁹ See *supra* note 76 (listing additional cases using this argument for defendants over age eighteen); see also J.R.H. Law, *Cherry-Picking Memories: Why Neuroimaging-Based Lie Detection Requires A New Framework for the Admissibility of Scientific Evidence Under FRE 702 and Daubert*, 14 YALE J. L. & TECH. 1, 50 (2011) (cautioning admittance of neuroscience for lie-detection purposes until better understood); Phillips, *supra* note 31, at 38-41 (providing examples of attorneys using neuroimages as evidence in the courtroom).

¹⁰⁰ See *supra* Part III (explaining recent advancements in neuroscience and application in courtroom); see also Betsy J. Gray, *Neuroscience, PTSD, and Sentencing Mitigation*, 34 CARDOZO L. REV. 53, 91-94 (2012) (considering use of neuroscience in sentencing defendants diagnosed with Post Traumatic Stress Disorder (PTSD)); Law, *supra* note 99, at 74-87 (illustrating courts’ contradictory admission of functional neuroimaging to prove general but not individual mental illness).

¹⁰¹ See *supra* notes 90-95 and accompanying text (discussing Commission Report’s comprehensive findings and recommendations); see also Thomas Nadelhoffer & Eddy Nahmias, *Neuroscience, Free Will, Folk Intuitions, and the Criminal Law*, 36 T. MARSHALL L. REV. 157, 173-74 (2011) (discussing philosophical shift necessary to redefine free will in legal system). Although the traditional concept of free will in decision-making will continue to play a major role in the administration of justice, “neuroscience and psychology have shown, and are likely to

V. CONCLUSION

Almost a century ago, a committee was formed with the express purpose of providing recommendations to the states on how to administer juvenile justice. Endorsing a uniform set of standards to evaluate individuals under eighteen by a different set of rules than “adults” had its skeptics in 1923; neuropsychologists testifying to brain activity that effects the maturity of a nineteen-year-old will be no different. Lawyers will continue to be creative in utilizing these experts during trials and sentencing hearings to show that the defendant’s brain structure should be considered as a mitigating factor. Although the defense attorneys were ultimately unsuccessful in presenting such an argument to the Second Circuit in *U.S. v. Reingold*, the result may have been different if they were arguing to go outside of the sentencing guidelines minimum, rather than the statutory minimum.

Twenty years ago, it was an accepted principle that a seventeen-year-old who commits a terrible act should be held accountable for his actions, regardless of whether that was through execution or life in prison. Today, both sentences are unconstitutional. The rapid expansions in the field of neuroscience have led many experts to question our traditional values surrounding behavior and culpability. However, given the historical evolution of our current policy and the broad implications of reversing *Reingold*, the Supreme Court is unlikely to grant certiorari or take action on a similar case for many years. The unique role of the Sentencing Commission, on the other hand, provides the legal system a separate platform with which to evaluate the proper judicial response to this relatively new science following the Supreme Court’s decisions in *Roper*, *Graham*, and *Miller*.

Does neuropsychology present sufficient evidence to define a new age for an adult in the legal system; should the immaturity of a defendant’s brain be considered a mitigating factor in sentencing; or is this just another example of a reckless generation that refuses to take responsibility for their actions? These are the questions that will continue to be debated in the courtroom, by the media, and in living rooms across the country. Clearly, there is no definitive solution to these questions—as there rarely is in psychology or the law—but the legal community has a duty to confront these questions. The Sentencing Commission, similar to the Juvenile-Court

continue to show, that people’s conscious reasoning and self-control play a less significant role in their behavior than we tend to assume, and than the law seems to assume.” See Nadelhoffer & Nahmias, *supra*, at 175.

Standards Committee in 1923, is the most appropriate vehicle to lay the foundation for that conversation.

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