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The Myth of Youth: Rethinking the Negligence Standard of Care for Minors in the Age of Neuroscience

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The Myth of Youth: Rethinking the Negligence Standard of Care for Minors in the Age of Neuroscience

Thomas Salazar*

“Until recently each generation found it more expedient to plead guilty to the charge of being young and ignorant. . .the command to grow up at once was more bearable than the faceless horror of wavering purpose, which was youth.”

* * *

MAYA ANGELOU, I KNOW WHY THE CAGED BIRD SINGS (New York Random House 1969)

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I. INTRODUCTION

Joseph is a sophomore at his local university, proudly representing the most popular fraternity in school.¹ This year’s “Rush Week” was successful and even more pledges want to join the fraternity than last year.² However, in the spirit of tradition, the new pledges must endure a secret ritual known as “Hell Night” to formally become members of the fraternity.³ Hell Night is finally here: Joseph’s assignment involves pouring kitchen items on the pledges while the pledges walk

1. See Goodwall Team, *Greek Life 101: A Full Introduction into College Fraternities & Sororities*, GOODWALL BLOG (June 23, 2021), <https://www.goodwall.io/blog/greek-life-college-fraternities-sororities/> (on file with the *University of the Pacific Law Review*) (defining fraternities as “an invitation-only society for high academic achievers” in college but evolving to include those with “a more social purpose”).

2. See *What is Rush?*, CAMPUS EXPLORER (Sept. 27, 2021), <https://www.campusexplorer.com/student-resources/rush-week/?ref=blog> (on file with the *University of the Pacific Law Review*) (explaining that rush week is recruitment period for new fraternity members; interested recruits become pledges when they accept the invitation to join the fraternity).

3. See Pat Hagerty, *Fraternity Hell Week*, FRATERNITY ADVISOR (Jan. 23, 2010), <https://thefraternityadvisor.com/fraternity-hell-week/> (on file with the *University of the Pacific Law Review*) (explaining that Hell [Night] occurs at the end of the new member period and involves various events to keep new members up until early morning); *Furek v. Univ. of Del.*, 594 A.2d 506, 509 (Del. 1991).

blindfolded through the house.⁴ After rounds of pancake batter, flour, and ketchup, the other fraternity brothers encourage Joseph to scour the pantry for more kitchen items.⁵ In the heat of the moment, Joseph grabs the lye-based liquid oven cleaner and pours it on one of the pledges.⁶ The gravity of the situation becomes apparent within minutes.⁷ The pledge suffers an adverse reaction to the oven cleaner, which leads to first-degree burns.⁸ Consequently, the pledge sues Joseph, the University, and the fraternity for negligence.⁹ The jury found that Joseph's conduct was below the standard required of a "reasonable adult" and held him liable for negligence.¹⁰ Ultimately, the University and the fraternity escaped liability through jurisdictional and post-trial rulings, leaving Joseph liable for the entire judgment.¹¹

This anecdote is not fictitious: it is actually the story of Joseph Donchez, who was an upperclassman at the University of Delaware when these incidents occurred.¹² The facts of this case illustrate a fundamental problem with negligence law's approach to the liability of young adults.¹³ Because Donchez was over eighteen years old, the jury judged Donchez under the standard of a reasonable adult, rather than the more relaxed standard of care required of minors.¹⁴ This approach remains the norm in courts across the country.¹⁵ However, modern advances in neuroscience and psychology indicate that adolescent cognitive development continues well into adulthood.¹⁶ While it is too late for Donchez, these scientific insights could expand current negligence standards and bring greater fairness to similarly situated young adults in the future.¹⁷

The traditional premise for liability in negligence law is fault.¹⁸ Courts find legal fault when an actor's conduct is unreasonable in light of the risks they perceived—or should have perceived—from their actions.¹⁹ Thus, negligence law

4. Hagerty, *supra* note 3.

5. *Id.*; *Furek*, 594 A.2d at 508–12.

6. Hagerty, *supra* note 3.

7. See Rik Helewell, *Potential Dangers of Oven Cleaning Products*, OVENU BLOG (Jan. 28, 2010), <https://www.oven.co.uk/blog/potential-dangers-of-oven-cleaning-products/> (on file with the *University of the Pacific Law Review*) (noting that lye, also known as sodium hydroxide, can cause irritation and burning in humans).

8. *Id.*; *Furek*, 594 A.2d at 510.

9. See RESTATEMENT (THIRD) OF TORTS § 3 (AM. L. INST. 2010) ("A person acts negligently if the person does not exercise reasonable care under all circumstances."); *Furek*, 594 A.2d at 508–12.

10. RESTATEMENT (THIRD) OF TORTS § 3 (AM. L. INST. 2010).

11. *Id.*

12. *Furek*, 594 A.2d at 508–12.

13. *Id.*

14. *Id.*

15. See OSCAR GRAY ET AL., HARPER, JAMES AND GRAY ON TORTS 149 (3d ed. 2021) (noting that child defendant must technically be a minor for the relaxed standard of care to apply).

16. See generally Sarah B. Johnson et al., *Adolescent Maturity and the Brain: The Promise and Pitfalls of Neuroscience Research in Adolescent Health Policy*, 45 J. ADOLESCENT HEALTH 216, 221 (2010).

17. *Id.* at 220.

18. GRAY ET AL., *supra* note 15, at 64.

19. *Id.* at 108–09 (noting that reasonable care is the level of care an individual with ordinary prudence

generally expects all actors to exercise reasonable care and courts rely on the reasonable person standard to judge whether their conduct was negligent.²⁰ However, when the actor is a minor, the law allows consideration of the minor's age, intelligence, and experience when determining negligence liability.²¹ One exception to this rule applies when the minor engages in an adult or inherently dangerous activity; in those cases, courts uniformly apply the reasonable adult standard.²² Overall, negligence law's approach to the liability of minors has remained consistent for well over a century.²³

Recent developments in psychology and neuroscience have expanded the understanding of adolescent cognitive development and their trajectory to becoming fully mature adults.²⁴ Such insights, in turn, hold the promise of future growth in how the law treats adolescents.²⁵ Notably, the scientific literature shows protracted maturation of key brain regions, including the prefrontal cortex, the amygdala, and grey and white matter.²⁶ These structures are responsible for many of the brain's higher functions, and they play an important role in adolescent risk-taking behavior and susceptibility to peer pressure.²⁷ While the influence of neuroscientific advances already started trickling into criminal law, applications in the civil context remain sparse.²⁸ However, since negligence liability hinges on human behavior, negligence law represents another legal system ripe for neuroscience-based reform.²⁹

Modern neuroscience and psychology insights into brain development support expanding the current negligence standard of care for minors.³⁰ This requirement is consistent with core negligence principles of fault, risk assessment, justice, and flexibility.³¹ Notably, the prevailing standard of care for minors provides a workable framework for analyzing the conduct of young adults in negligence

would exercise in similar circumstances).

20. *Id.*

21. Donald Gee, *The Liability of Children*, 35 TRIAL 52, 53 (1999).

22. *Id.* at 54 (1999).

23. Harry Shulman, *The Standard of Care Required of Children*, 37 YALE L.J. 618, 621 (1927); Gee, *supra* note 21.

24. Vicki Anderson, *Development of Executive Functions Through Late Childhood and Adolescence in an Australian Sample*, 20 DEVELOPMENTAL NEUROPSYCHOLOGY 385, 388 (2001); Johnson et al., *supra* note 16, at 220; B.J. Casey & Kristina Caudle, *The Teenage Brain: Self Control*, 22 CURRENT DIRECTIONS PSYCH. SCI. 82, 85 (2013).

25. Johnson et al., *supra* note 16, at 219.

26. *See id.* at 220 (noting that these brain regions reach full maturity later than previously thought).

27. *Id.*

28. *See* Tim Requarth, *Neuroscience Is Changing the Debate Over What Role Age Should Play in the Courts*, NEWSWEEK (Apr. 18, 2016), <https://www.newsweek.com/2016/04/29/young-brains-neuroscience-juvenile-inmates-criminal-justice-449000.html> (on file with the *University of the Pacific Law Review*) (noting that the Supreme Court has relied on neuroscience evidence in recent cases involving juvenile criminal justice).

29. *See* GRAY ET AL., *supra* note 15, at 103 (“[N]egligence is conduct”).

30. Johnson et al., *supra* note 16, at 220.

31. *Infra* Part II.A.

cases.³² This Comment proposes courts should extend application of the relaxed standard of care for minors through age twenty-five while maintaining the adult activities doctrine as a critical safety net for negligence victims.³³ Part II provides the basic framework and principles governing negligence liability.³⁴ Part III considers the standard of care required of minors and the adult activities exception.³⁵ Part IV explores the issues with negligence law's current approach to minors and rationales for expanding the standard of care required of minors.³⁶ Part V considers the adult activities doctrine in light of the scientific literature.³⁷ Part VI discusses the role contributory negligence plays in cases applying the relaxed standard of care.³⁸ Part VII articulates the scientific, legal, and cultural challenges associated with expanding the negligence standard of care for minors to age twenty-five.³⁹

II. ORIGINS AND EVOLUTION OF THE NEGLIGENCE STANDARD OF CARE

The Second Restatement of Torts defines negligence as “conduct which falls below the standard established by law for the protection of others against unreasonable risk of harm.”⁴⁰ This standard is objective rather than subjective, which means courts scrutinize negligent conduct based on external behavior rather than the individual's internal state of mind.⁴¹ Thus, an actor is negligent when their conduct does not comport with what a reasonable person would do under similar circumstances.⁴² Section A discusses the foundational principles of negligence liability originating from the common law.⁴³ Section B describes the evolution of the reasonable person standard and introduces exceptions to the general standard.⁴⁴

32. Gee, *supra* note 21, at 53.

33. *Id.*

34. *Infra* Part II.

35. *Infra* Part III.

36. *Infra* Part IV.

37. *Infra* Part V.

38. *Infra* Part VI.

39. *Infra* Part VII.

40. RESTATEMENT (SECOND) OF TORTS § 282 (AM. L. INST. 1965).

41. *Id.*

42. *Id.*

43. *Infra* Section II.A.

44. *Infra* Section II.B.

A. Foundational Principles of Negligence Liability

At the core of negligence liability is the concept of fault: an actor's conduct must be negligent to deserve legal condemnation.⁴⁵ However, legal fault in negligence actions does not faithfully correspond with moral fault.⁴⁶ Instead, courts developed a standard that inquires whether an actor's conduct comports with societal standards of reasonable conduct.⁴⁷ This societal standard is objective; thus, negligence suits require measuring an individual's conduct against that of a reasonable person under similar circumstances.⁴⁸ Because the reasonable person is an abstract ideal, courts generally do not consider an individual's shortcomings—such as poor judgment or clumsiness—when assessing fault.⁴⁹ For example, an absentminded law student who accidentally drops heavy books on the librarian is negligent if a reasonable, attentive student would not have dropped the books.⁵⁰ Accordingly, some individuals suffer the legal consequences of negligence liability for failing to comply with a standard they cannot meet.⁵¹

The fault principle relies on whether an individual perceived, or should have reasonably perceived, the risks of their actions.⁵² The next step requires determining whether the individual, despite those risks, acted unreasonably.⁵³ Within this context, risk assessment is fundamental to negligence liability.⁵⁴ For example, a railroad company is negligent for not providing security at the premises of a train station with a history of robbery and assault.⁵⁵ A grocer who neither knew or should have known of a rattlesnake on market premises, however, is not liable for a customer's rattlesnake bite injury.⁵⁶ Thus, risk assessment is a matter of probability rather than possibility: it requires individuals to analyze the probable risks of their conduct considering the knowledge available to them.⁵⁷

45. See *Ives v. S. Buffalo Ry. Co.*, 94 N.E. 431, 436 (N.Y. 1911) (holding New York's first worker compensation law unconstitutional because it imposed liability without fault).

46. See GRAY ET AL., *supra* note 15, at 108 (noting that moral responsibility, recognizing the difference between right and wrong behavior, does not always equate to legal responsibility in negligence).

47. *Id.*

48. See PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS § 32 (5th ed. 1984) (“The standard of conduct which the community demands must be an external and objective one, rather than the individual judgment.”).

49. GRAY ET AL., *supra* note 15, at 108.

50. *Id.*

51. *Id.* (noting that courts rejected subjective standards, and that whether the defendant exercised their best individual judgment is irrelevant for purposes of determining negligence liability).

52. See PAGE KEETON ET AL., *supra* note 48 (“[The standard] must make proper allowance for the risk apparent to the actor, for his capacity to meet it, and for the circumstances under which he must act.”).

53. *Id.*

54. See *Foster v. City of Union*, 129 S.C. 257 (1924) (holding that the “foundation of liability for negligence is knowledge”).

55. *Haynes v. Chicago Transit Auth.*, 376 N.E. 2d 680 (Ill. App. 1978).

56. *Overstreet v. Gibson Prod. Co., Inc. of Del Rio*, 558 S.W.2d 58 (Tex. App. 1977).

57. GRAY ET AL., *supra* note 15, at 116.

Just like the negligence fault principle relies on societal standards, negligence principles of justice and fairness also depend on public perception.⁵⁸ The law presumes individuals have freedom of choice: an ability to reason and make autonomous behavioral decisions.⁵⁹ While an actor can freely expose themselves to risk in pursuit of a goal, justice and fairness dictate that the actor cannot expose oblivious third-parties to involuntary risk.⁶⁰ Further, fairness and justice require accountability for injuries and risks an actor should or could have prevented.⁶¹ These overarching principles ensure negligence law comports with community expectations.⁶²

Negligence law did not enter American jurisprudence fully developed.⁶³ Instead, the law evolved over time in a piecemeal approach through a triangular interaction between law professors, judges, and legal practitioners.⁶⁴ As society changed, so did negligence jurisprudence.⁶⁵ This evolution continues today with the advent of America's technological advances.⁶⁶ However, negligence law has been particularly slow to embrace recent developments in neuroscience.⁶⁷ For example, negligence law makes special accommodations for physical infirmities but not for mental illnesses, despite neuroscience showing how physical processes form the basis of mental disability.⁶⁸ While inherent within negligence law is the flexibility to adapt to changing conditions, courts will dictate whether current paradigms will evolve in response to neuroscientific advances.⁶⁹

58. *See id.* at 37 (observing that a legal system must operate fairly to receive public acceptance).

59. *See* OLIVER WENDELL HOLMES, JR., *THE COMMON LAW* 87 (1881) (noting that negligence liability is appropriate where the injurer had the "power of avoiding the evil complained of").

60. *See* Gregory Keating, *Fairness and Two Fundamental Questions in the Tort Law of Accidents* 6 (U.S.C. L. Sch. Olin, Working Paper No. 99-21, 2000) ("The circumstance where we voluntarily expose ourselves to risks in the pursuit of our own ends is very different from the circumstance where others involuntarily expose us to risks in the pursuit of their ends.").

61. *See id.* ("Negligent risks are ones whose imposition it is fair to ask injurers to prevent; their prevention strikes a fair balance between the claims of liberty and security.").

62. *See* GRAY ET AL., *supra* note 15, at 37 (observing that negligence law must "satisfy the ethical or moral sense of the community").

63. *See* T. STREET, *FOUNDATIONS OF LEGAL LIABILITY* 182 (1906) (noting that the word "negligence" did not appear in any year books or digests of English law before Comyns' (1762–1767)).

64. *Id.* at 182–90 (1906); GRAY ET AL., *supra* note 15, at 48.

65. *See* STREET, *supra* note 62, at 182–90 (1906) (noting that negligence developed from strict liability trespass actions, which included nuisance and property damage from spread of fire); GRAY ET AL., *supra* note 15, at 49 (observing that the shift from strict liability to negligence coincided with the industrial revolution).

66. *See* *Payne v. ABB Flexible Automation*, No. 96-2248, 1997 U.S. App. LEXIS 13571 (8th Cir. June 9, 1997) (alleging negligence against a manufacturer of an industrial robot that killed the robot operator); *Taylor v. Intuitive Surgical, Inc.*, 389 P.3d 517 (Wash. 2017) (holding the manufacturer of a robotic surgical device liable for the death of a patient following a robotic prostatectomy).

67. *See* Betsy J. Grey, *Implications of Neuroscience Advances in Tort Law: A General Overview*, 12 *IND. HEALTH L. REV.* 671, 671 (2015) ("If you look at tort decisions in the last couple of decades and ask what role neuroscience had, the answer is almost none.").

68. GRAY ET AL., *supra* note 15, at 139; Ian Cosgrove, *The Illusive "Reasonable Person": Can Neuroscience Help the Mentally Disabled?*, 91 *NOTRE DAME L. REV.* 421, 421–23 (2015).

69. GRAY ET AL., *supra* note 15, at 118.

B. The Evolution of the Reasonable Person Standard

Renowned legal scholar and Supreme Court Justice Oliver Holmes described the standard for negligence liability as the reasonable “man of ordinary intelligence and prudence.”⁷⁰ Rationales for the universality of the objective standard in negligence courts include practicality, justice, and the protection of injured victims’ interests.⁷¹ Notwithstanding the prevalence of the reasonable person standard, scholars have advocated for a refined standard as new advances in science emerge.⁷² Further, several exceptions to the rule have evolved over time.⁷³ For example, courts hold physically disabled persons to the standard of a reasonable person with a like disability.⁷⁴ Certain states employ the negligence per se doctrine, where regulatory schemes concerning public safety often substitute the reasonable person standard.⁷⁵ Courts hold professionals, such as doctors and lawyers, to the standard of care established by the custom of their profession.⁷⁶ Lastly, courts apply a modified standard of care for minors: comparing a minor’s conduct to that of other reasonable children with like age, intelligence, experience, and maturity.⁷⁷

III. THE STANDARD OF CARE FOR MINORS IN NEGLIGENCE

The standard of care for minors developed early in negligence jurisprudence to recognize the capacity limitations of child defendants.⁷⁸ Minors are immature, meaning they are incapable of exercising caution for their own safety and their actions are often impulsive.⁷⁹ Typically, courts hold minors to the standard of care for ordinary minors of like age, intelligence, and experience under similar

70. OLIVER WENDELL HOLMES, JR., *supra* note 59, at 99.

71. See PAGE KEETON ET AL., *supra* note 48, at 174 (5th ed. 1984) (“[The law] must be, so far as possible, the same for all persons, since the law can have no favorites.”); GRAY ET AL., *supra* note 15, at 109 (observing that the interest of compensating injured victims is more important than the interest in personalizing the fault principle).

72. Warren A. Seavey, *Negligence—Subjective or Objective?*, 41 HARV. L. REV. 1, 27 (1927); William Rodgers, *Negligence Reconsidered: The Role of Rationality in Tort Theory*, 54 S. CAL. L. REV. 1 (1980); John Meixner Jr., *Neuroscience and Mental Competency: Current Uses and Future Potential*, 81 ALB. L. REV. 995, 1025 (2018); Jean Macchiaroli Eggen & Eric J. Laury, *Toward a Neuroscience Model of Tort Law: How Functional Neuroimaging Will Transform Tort Doctrine*, 13 COLUM. SCI. & TECH. L. REV. 235, 275–76 (2012); Grey, *supra* note 67, at 693; Jean Macchiaroli Eggen, *Mental Disabilities and Duty in Negligence Law: Will Neuroscience Reform Tort Doctrine?*, 12 IND. HEALTH L. REV. 591, 633 (2015).

73. GRAY ET AL., *supra* note 15, at 108–109.

74. *Id.* at 139–141; *Denson v. Estate of Dillard*, 116 N.E.3d 535, 540 (Ind. Ct. App. 2018).

75. See RESTATEMENT (THIRD) OF TORTS § 14 (AM. L. INST. 2010) (“An actor is negligent if . . . the actor violates a statute. . . within the class of person the statute is designed to protect.”).

76. *Id.* at § 13.

77. *Id.* at § 10.

78. See Shulman, *supra* note 23, at 618 (observing that holding minor to the same standard as adults would be to ignore the “facts of life and to burden unduly the child’s growth to majority”).

79. Gee, *supra* note 21, at 52.

circumstances.⁸⁰ While no consensus exists between jurisdictions for an age cut-off to the reasonable person standard, the general threshold is the age of majority: eighteen in most states.⁸¹ The literature provides several rationales for the relaxed standard of care for minors.⁸² From a public policy perspective, it would be unfair for courts to hold minors liable based on the reasonable person standard when most minors cannot meet this standard.⁸³ From a welfare perspective, society wants to encourage minors to develop normally through childhood activities without the risk of adult burdens.⁸⁴ Lastly, from a developmental perspective, minors lack the capacity to appropriately appreciate the risks of their actions because their brains are still maturing.⁸⁵

While most jurisdictions adopted some variation of the relaxed standard for minors, a few states developed supplementary doctrines in furtherance of judicial expediency and efficiency.⁸⁶ For example, the Tender Years Doctrine posits that children under a certain age—which varies by jurisdiction—are legally incapable of negligence.⁸⁷ Several jurisdictions also adopted the Illinois Rule, which

80. See Oscar Gray, *Standard of Care for Children Revisited*, 45 MO. L. REV. 597, 600 (1980) (noting that while courts typically examine age, intelligence, and experience, the catalog of factors varies by jurisdiction).

81. See GRAY ET AL., *supra* note 15, at 149 (alluding to the concept that the child defendant must technically be a minor); RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010) (noting that an individual above the age of majority does not receive the benefits of the relaxed standard of care); Elissa Suh, *The Age of Majority and the UTMA Account Distribution Age in Every State*, POLICY GENIUS (Dec. 1, 2021), <https://www.policygenius.com/estate-planning/age-of-majority-by-state/> (on file with the *University of the Pacific Law Review*) (explaining that the only states that do not set the age of majority at 18 are Alabama (19), Nebraska (19) and Mississippi (21)); Baker v. Helms, 527 So. 2d 1241, 1244 (Ala. 1988) (applying the reasonable person standard to an 18-year old defendant); Congini by Congini v. Portersville Valve Co., 470 A.2d 515, 518 (Pa. 1983) (holding that an eighteen year old defendant is “liable as an adult for the offenses which he commits”); Colwell v. Nygaard, 8 Wash 2d 462, 476 (1941) (“Persons eighteen years of age should be held to the exercise of the same judgment and discretion in caring for their own safety as persons more advanced in years.”); Goss v. Allen, 360 A.2d 388 (N.J. 1976) (“18 years of age is the age at which a person is to be held to adult responsibility in tort matters.”).

82. See generally DAN B. DOBBS ET AL., THE LAW OF TORTS § 135 (2d ed. 2021) (describing several rationales for the minor standard of care in negligence).

83. See Roth v. Union Depot Co., 43 P. 641, 647 (Wash. 1896) (“[I]t would be monstrous doctrine to hold that a child of inexperience—and experience can only come with years—should be held to the same degree of care in avoiding danger as a person of mature years and accumulated experience.”).

84. GL Bahr, *Tort Law and the Games Kids Play*, 23 S.D. L. REV. 275, 297 (1978); Caroline Forell, *Reassessing the Negligence Standard of Care for Minors*, 15 N.M. L. REV. 485, 498 (1985).

85. See GRAY ET AL., *supra* note 15, at 149 (noting that negligence liability requires either that the actor appreciates an unreasonable risk of injury or could appreciate the risk if he conducted himself as a reasonable person).

86. Gee, *supra* note 21, at 52; e.g., Lutteman v. Martin, 135 A.2d 600, 602 (Conn. C.P. 1957) (“like age, intelligence and experience”); e.g., McGregor v. Marini, 256 So. 2d 542, 543 (Fla. Dist. Ct. App. 1972) (“a child of like age, intelligence, experience and training”); e.g., Grace v. Kumalaa, 386 P.2d 872 (Haw. 1963) (“appropriate to his age, experience, and mental capacity”); e.g., LaNoux v. Hagar, 308 N.E. 2d 873, 876 (Ind. Ct. App. 1974) (“like age, knowledge, and experience”).

87. See English v. 1st Augusta, Ltd., 614 F. Supp. 1406, 1407 (S.D. Ga. 1985) (finding a three-year-old incapable of negligence); Hampton v. Hammons, 743 P.2d 1053, 1061 (Okla. 1987) (finding a five-year-old incapable of negligence); Yarborough v. Berner, 467 S.W.2d 188, 190 (Tex. 1971) (holding that children below five are incapable of negligence); Benallo v. Bare, 427 P.2d 323, 325 (Colo. 1967) (holding that children below age seven are incapable of negligence); Majors v. J.C. Penney Co., 506 P.2d 399, 401 (Colo. Ct. App. 1972)

proposes fixed, age-based presumptions.⁸⁸ Under the Illinois Rule, children under the age of seven are incapable of negligence as a matter of law.⁸⁹ Notwithstanding these minority age-based doctrines, the modern trend inquires whether the minor acted negligently based on case-specific facts rather than age-based presumptions.⁹⁰

The Adult Activities Doctrine—an important caveat in the standard of care for minors—holds minors to the reasonable person standard when they engage in adult activities.⁹¹ The leading case is *Dellwo v. Pearson*, where the court determined that operation of a motorboat was an adult activity.⁹² Courts justify the doctrine under the premise that adult activities are inherently dangerous and generally insured; thus, society expects minors to exercise due care when engaging in these activities.⁹³ Examples of adult activities include operating a snowmobile, playing golf, and driving a farm tractor.⁹⁴ Notably, courts apply different standards for determining whether an activity is an adult activity.⁹⁵ Although the doctrine became entrenched in negligence law over time, scholars have criticized the approach as ambiguous and arbitrary.⁹⁶

(finding a six-year-old incapable of negligence); *Swindell v. Hellkamp*, 242 So.2d 708, 710 (Fla. 1970) (holding that children under six are incapable of negligence).

88. *Gee*, *supra* note 21, at 52.

89. *Chicago City Railway Co. v. Tuohy*, 95 Ill. App. 314, 319 (1901).

90. *See Gee*, *supra* note 21, at 54 (observing that the proper jury instruction requires factfinders to compare the minor defendant’s conduct to minors of like “age, judgment, and experience”).

91. William Binchy, *The Adult Activities Doctrine in Negligence Law*, 11 WM. MITCHELL L. REV. 733, 735 (1985).

92. *Dellwo v. Pearson*, 107 N.W. 2d 859, 863 (Minn. 1961).

93. *See Robinson v. Lindsay*, 598 P.2d 392, 394 (Wash. 1979) (noting that the doctrine discourages minors from engaging in inherently dangerous activities); Binchy, *supra* note 91, at 743–44 (observing that adult activities, such as driving a motor vehicle, are normally insured); *Daniels v. Evans*, 107 N.H. 407, 410 (1966) (noting that highway drivers expect other drivers to obey traffic laws and exercise due care).

94. *See Robinson*, 598 P.2d at 394 (holding a 13-year-old liable for a snowmobile accident under the reasonable person standard); *Neumann v. Shlansky*, 294 N.Y.S. 2d 628 (County Ct. 1968) (applying the reasonable person standard to an 11-year-old golfer); *Jackson v. McCuiston*, 448 S.W.2d 33, 35 (Ark. 1969) (applying the reasonable person standard to a minor operating the family farm tractor).

95. *See Binchy*, *supra* note 91, at 741–59 (explaining that the prevailing standards for determining whether the doctrine applies is whether the activity is inherently dangerous and whether the activity is one normally reserved for adults).

96. *See id.* at 775 (asserting that the adult activities doctrine is based on “questionable policy rationales”).

IV. NEUROSCIENCE AND PSYCHOLOGY INSIGHTS ON BRAIN DEVELOPMENT
THROUGH YOUNG ADULTHOOD

American society is experiencing a cultural shift marked by a delay in adolescents' developmental trajectory to adulthood.⁹⁷ Today's adolescents and young adults are less likely to obtain driver's licenses compared to their counterparts fifty years ago.⁹⁸ Similarly, teenagers today are less likely to engage in traditional adult activities, such as drinking alcohol, having sex, or working for pay, than their 1970s counterparts.⁹⁹ These trends indicate that modern society perceives adolescents and young adults as cognitively immature, not fully-fledged adults.¹⁰⁰ Concurrently, recent insights in psychology and neuroscience show adolescents continue their cognitive development beyond their teenage years.¹⁰¹ Scientific research substantiates what society is beginning to recognize: adolescents do not reach full cognitive maturity until their mid-twenties.¹⁰²

In the field of cognitive psychology, adolescence is a developmental period extending into the early twenties; this period is also known as young adulthood.¹⁰³ Several themes emerge as adolescents gradually reach full cognitive maturity.¹⁰⁴ Compared to fully mature adults, developing adolescents are more likely to engage in risky behaviors and "less likely to anticipate the consequences of their actions."¹⁰⁵ Adolescents also display developmental immaturity on measures of

97. See Elizabeth Heubeck, *Teens Seem to Be Taking Longer to Grow Up. One Reason? A Closer Bond with Their Parents*, WASH. POST (Sept. 4, 2019), <https://www.washingtonpost.com/lifestyle/2019/09/04/teens-seem-be-taking-longer-grow-up-one-reason-closer-bond-with-their-parents/> (on file with the *University of the Pacific Law Review*) (referring to this phenomenon as "emerging adulthood"; the period between ages 18 through 25); Robin Marantz Henig, *What Is It About 20-Somethings?*, N.Y. TIMES (Aug. 18, 2010), https://www.nytimes.com/2010/08/22/magazine/22Adulthood-t.html?pagewanted=all&_r=0 (on file with the *University of the Pacific Law Review*) (observing that today young people are "taking longer to reach adulthood").

98. See Nathan Bomey, *Millennials Spurn Driver's Licenses, Study Finds*, USA TODAY (Jan. 19, 2016), <https://www.usatoday.com/story/money/cars/2016/01/19/drivers-licenses-uber-lyft/78994526/> (on file with the *University of the Pacific Law Review*) (noting that between 1983 and 2014, driver's license possession by adolescents dropped by 21.7%; driver's license possession by young adults dropped by 15.1%). *But see* Robert Tate, *Remembering the Early Days of Driver's Education*, MOTORCITIES.ORG (Apr. 17, 2017), <https://www.motorcities.org/story-of-the-week/2017/remembering-the-early-days-of-driver-s-education> (on file with the *University of the Pacific Law Review*) (observing that some public schools eliminated driver's education programs in the 1990s).

99. See Jean M. Twenge, *The Decline in Adult Activities Among U.S. Adolescents, 1976–2016*, 90 CHILD DEV. 638, 645 (relying on seven nationally representative surveys on over eight million adolescents to show that these trends are not a result of homework and extracurricular activities).

100. *Id.*

101. See generally Johnson et al., *supra* note 16 (summarizing recent neuroscience research on brain development which shows that the adolescent brain continues maturing into the mid-twenties).

102. Johnson et al., *supra* note 16.

103. See Elizabeth S. Scott & Laurence Steinberg, *Blaming Youth*, 81 TEX. L. REV. 799, 811 (2003) (noting that adolescence is the "bridge between childhood and adulthood").

104. *Id.*

105. See Laurence Steinberg et al., *Age Differences in Future Orientation and Delay Discounting*, 80 CHILD DEV. 28, 28 (2009) (showing that older adults are more adept at anticipating future consequences than adolescents and young adults); Elizabeth Cauffman, *Age Differences in Affective Decision Making as Indexed by*

temperance, defined as “the ability to evaluate a situation before acting.”¹⁰⁶ With respect to peer pressure, adolescents are more vulnerable to coercion from their peers than older adults.¹⁰⁷ While individuals vary, these tendencies are characteristic of adolescent behavior and development.¹⁰⁸

Neuroscience research provides an anatomical and physiological basis for the behavioral trends observed in adolescents as they develop into fully mature adults.¹⁰⁹ Recent advances in neuroimaging technology led to the discovery that children’s brains do not fully mature, on average, until age twenty-five.¹¹⁰ Particularly, the prefrontal cortex—the area of the brain that coordinates executive functioning—is among the last to mature.¹¹¹ Studies using magnetic resonance imaging (MRI) techniques show that adolescent cognitive immaturity is a result of an underdeveloped prefrontal cortex.¹¹² The prefrontal cortex is essential for controlling voluntary behavior, assessing risk, controlling impulses, and evaluating rewards and punishments.¹¹³ In addition to the prefrontal cortex, the brain region associated with emotional control and stress management, the amygdala, also plays an important developmental role.¹¹⁴ Together, the prefrontal cortex and the amygdala are responsible for an adolescent’s maturity of judgment.¹¹⁵

Performance on the Iowa Gambling Task, 46 DEVELOPMENTAL PSYCH. 193, 204–06 (2010) (showing that risk-avoidance behaviors increase linearly with age in a study with individuals between ages 12 and 30).

106. See Kathryn L. Modecki, *Addressing Gaps in the Maturity of Judgment Literature: Age Differences and Delinquency*, 32 L. & HUM. BEHAV. 78, 80–85 (2008) (describing temperance as one of the elements of maturity of judgment).

107. See Graham Bradley & Karen Wildman, *Psychosocial Predictors of Emerging Adults’ Risk and Reckless Behaviors*, 31 J. YOUTH & ADOLESCENCE 253, 253–54 (2002) (finding that peer pressure is a highly significant predictor of reckless behavior in adolescents and young adults).

108. See LAURENCE STEINBERG, YOUTH ON TRIAL: A DEVELOPMENTAL PERSPECTIVE ON JUVENILE JUSTICE 24 (Thomas Grisso & Robert G. Schwartz eds., 2000) (“Within any given individual, the developmental timetable of different aspects of maturation may vary markedly.”); B.J. Casey, Rebecca M. Jones & Todd A. Hare, *The Adolescent Brain*, 1124 ANNALS N.Y. ACAD. SCI. 111, 119–21 (2008) (noting that while brain studies show structural maturity across a group, individual variance will still exist).

109. See Johnson et al., *supra* note 16, at 216 (summarizing recent neuroscience research on brain development which shows that the adolescent brain continues maturing into the mid-twenties).

110. See *id.* at 218 (noting that executive functioning refers to the skills needed for goal-directed behavior, which includes planning, memory, and attention).

111. See Anderson, *supra* note 24, at 401 (noting that executive functioning refers to the skills needed for goal-directed behavior, which includes planning, memory, and attention).

112. Mariam Arain, *Maturation of the Adolescent Brain*, 9 NEUROPSYCHIATRIC DISEASE & TREATMENT 449, 449–61 (Apr. 3, 2013); see also *Prefrontal Cortex*, GOODTHERAPY.ORG, <https://www.goodtherapy.org/blog/psychpedia/prefrontal-cortex> (on file with the *University of the Pacific Law Review*) (noting that the prefrontal cortex is the area located in the front of the brain).

113. Anderson, *supra* note 24, at 401.

114. See Johnson et al., *supra* note 16, at 219 (noting that the amygdala is linked to emotional maturity: “the ability to regulate and to interpret emotions”).

115. See *id.* (“The prefrontal cortex coordinates higher-order cognitive processes and executive functioning . . . Poor executive functioning leads to difficulty with planning, attention, using feedback, and mental inflexibility, all of which could undermine judgment and decision making.”).

Neuroimaging studies also reveal brain connectivity plays an important role in brain maturation.¹¹⁶ The neural processing and communication engines of the brain—gray matter and white matter—do not fully mature until the mid-twenties.¹¹⁷ Gray and white matter are composed of brain cells that allow the brain to process information more quickly and efficiently.¹¹⁸ While the volume of gray matter peaks early in adolescence, a process known as “pruning” selectively removes superfluous neural connections in response to environmental demands through adulthood.¹¹⁹ Connection “pruning,” as opposed to gray matter, is important in determining brain maturation because it represents a person’s ability to learn and adapt.¹²⁰ On the other hand, white matter continues to increase from childhood to adulthood.¹²¹ These dual neural systems work in tandem to facilitate the integration of brain activity and ensure efficient brain functioning.¹²² Ultimately, scientific research illuminates the neural mechanisms responsible for brain maturation and reflects the transitory, yet fundamental, transition of adolescents into adulthood.¹²³ Given the mounting evidence showing adolescents continue cognitive development until age twenty-five, it is time for courts to rethink the negligence standard of care for minors.¹²⁴

V. EXPANDING THE NEGLIGENCE STANDARD OF CARE FOR MINORS

Pioneering American psychologist G. Stanley Hall introduced American society to the concept of “adolescence” in 1904.¹²⁵ Hall described adolescence as a distinct developmental period between childhood and adulthood, characterized by cognitive and emotional maturation.¹²⁶ This notion was revolutionary at the

116. See *id.* (“[R]ecent work has broadened [brain development discussion] to the increasing ‘connectivity’ of the brain.”).

117. See Jay N. Giedd, *Brain Development During Childhood and Adolescence: A Longitudinal MRI Study*, 2 NATURE NEUROSCIENCE 861, 862–63 (1999) (observing that gray matter, the area primarily responsible for information processing, continues to increase through adolescence); Peter Anderson, *Assessment and Development Executive Function (EF) During Childhood*, 8 CHILD NEUROPSYCHOLOGY 71, 75 (2002) (noting that white matter is composed of myelin sheath, which allows nerve impulses to travel rapidly).

118. Johnson et al., *supra* note 16, at 219.

119. See Johnson et al., *supra* note 16, at 219 (showing that pruning, which reduces gray matter volume, also results in the specialization of brain regions).

120. Fergus Craik & Ellen Bialystok, *Cognition Through the Lifespan: Mechanisms of Change*, 10 TRENDS COGNITIVE SCIS. 132, 132 (2006).

121. See Johnson et al., *supra* note 16, at 219 (observing that an increase in white matter, a process known as myelination, corresponds with more efficient brain communication).

122. *Id.*

123. *Id.*

124. *Id.*; Louis Spear, *The Adolescent Brain and Age-Related Behavioral Manifestations*, 24 NATURE NEUROSCIENCE BIOBEHAVIORAL REV. 417, 417 (2000); Elizabeth R. Sowell et al., *Mapping Cortical Change Across the Human Life Span*, 6 NATURE NEUROSCIENCE 309–15 (2003).

125. See Jeffrey Jensen Arnett, *G. Stanley Hall’s Adolescence: Brilliance and Nonsense*, 9 HIST. PSYCH. 186, 186 (2006) (explaining that Hall’s work focused on childhood development and evolutionary theory).

126. *Id.* at 187.

time and quickly became ingrained in popular culture and scientific discourse.¹²⁷ In response to this scientific and cultural development, courts and legislatures began treating adolescents differently than fully mature adults.¹²⁸ Recent neuroscience insights into brain maturation signal a new shift in how society and science view adolescents.¹²⁹ Negligence law should follow suit.¹³⁰ Section A describes the problems with the current standard of care for minors' liability in negligence law.¹³¹ Section B explains how contemporary neuroscience advances support extending the negligence standard of care for minors to age twenty-five.¹³² Section C discusses how expanding the standard of care for minors comports with fundamental negligence principles.¹³³ Section D evaluates whether expanding the minor standard of care will frustrate negligence law's aim to compensate victims.¹³⁴

A. Problems with the Current Negligence Standard of Care for Minors

The prevailing standard for determining whether a minor is negligent requires judging the minor's ability to perceive risk according to their own experience, intelligence, and capacity.¹³⁵ This standard is both subjective and objective, which means courts can consider the minor's individual shortcomings in making this determination.¹³⁶ In application, courts generally stop applying the minor standard at the age of majority; beyond this age, courts judge individuals based on the objective reasonable person standard.¹³⁷ This approach ignores recent scientific

127. *Id.*

128. See Rhonda Gay Hartman, *Adolescent Autonomy: Clarifying an Ageless Conundrum*, 51 HASTINGS L.J. 1265, 1271–86 (2000) (observing that laws regarding contractual capacity, marital capacity, and criminal culpability changed as the concept of adolescence took hold within the legal system).

129. See generally Johnson et al., *supra* note 16, at 216 (summarizing recent neuroscience research on brain development which shows that the adolescent brain continues maturing into the mid-twenties).

130. See Grey, *supra* note 67, at 671 (“As advances occur, we will need to address whether the new neuroscience will shift paradigms in tort law.”); Eggen & Laury, *supra* note 72, at 235 (“As the courts become saturated with neuroimaging evidence, it is imperative to be prepared with a framework for addressing the many legal questions that the new neuroscience will pose.”).

131. *Infra* Section IV.A.

132. *Infra* Section IV.B.

133. *Infra* Section IV.C.

134. *Infra* Section IV.D.

135. See GRAY ET AL., *supra* note 15, at 149 (referring to the standard as a “well-respected academic view”).

136. *Id.*

137. See *Baker v. Helms*, 527 So. 2d 1241, 1244 (Ala. 1988) (applying the reasonable person standard to an 18-year-old defendant); *Congini by Congini v. Portersville Valve Co.*, 470 A.2d 515, 518 (Pa. 1983) (holding that an eighteen year old defendant is “liable as an adult for the offenses which he commits”); *Colwell v. Nygaard*, 8 Wash. 2d 462, 476 (Wash. 1941) (“Persons eighteen years of age should be held to the exercise of the same judgment and discretion in caring for their own safety as persons more advanced in years.”).

advances regarding adolescent development, unfairly imposes liability on adolescents that cannot meet the adult standard, and is a stark contrast to earlier, more flexible iterations.¹³⁸

Broad generalizations and archaic assumptions about child development form the current age-based negligence standards.¹³⁹ However, negligence law must evolve as the scientific community broadens its understanding of the adolescent brain.¹⁴⁰ Adolescent maturation into adulthood does not occur at the moment of turning age eighteen, but is rather a slow neurological process peaking when an adolescent reaches twenty-five years of age.¹⁴¹ Indeed, Congress already recognizes eighteen-year-olds are not fully mature adults.¹⁴² Most recently, Congress enacted the Foster Care Act of 2008, providing states financial incentives to extend foster care services to individuals between the ages of eighteen and twenty-one.¹⁴³ Because judicial decisions create most negligence law, courts must develop new negligence standards in response to changes in science and society.¹⁴⁴

In terms of fault, applying the adult standard of care to adolescents over eighteen in negligence actions imposes liability when there is no culpability.¹⁴⁵ Because the prefrontal cortex of adolescents does not fully develop until age twenty-five, this population is more prone to risky behavior and peer pressure.¹⁴⁶ For example, courts should apply the relaxed standard of care when a student under twenty-five pours various kitchen items on another, as a form of hazing, and an adverse reaction occurs.¹⁴⁷ Courts should also apply the relaxed standard of care when a young adult attempts a risky TikTok challenge or prank resulting in injuries to unsuspecting victims.¹⁴⁸ Whether the individual was unable to assess the risk of their actions due to their developmental immaturity is a matter better suited for

138. Johnson et al., *supra* note 16, at 216.

139. See Gee, *supra* note 21, at 52 (noting that the tender years doctrine sets an arbitrary age limit for when courts presume a child to lack capacity for negligence and observing that the Illinois rule, establishing age-based presumptions in multiples of seven, has origins in the common law and the Bible).

140. Grey, *supra* note 67, at 693; Eggen & Laury, *supra* note 72, at 294–95; Eggen, *supra* note 72, at 642.

141. See Johnson et al., *supra* note 16, at 216 (observing that the latest regions to develop in the brain—the prefrontal cortex, the amygdala, and grey and white matter—complete maturation at around age twenty-five).

142. See 18 U.S.C. § 922(b)(1), (c)(1) (1968) (prohibiting individuals younger than twenty-one from purchasing handguns from Federal Firearms Licensees); National Minimum Drinking Age Act, 23 U.S.C. § 158 (2012) (prohibiting individuals younger than twenty-one from purchasing alcohol).

143. Fostering Connections to Success and Increasing Adoptions Act of 2008, Pub. L. No. 110–351, § 201, 122 Stat. 3949.

144. See GRAY ET AL., *supra* note 15, at 118 (noting that negligence law, unlike criminal law, is not codified).

145. See WILLIAM PROSSER, HANDBOOK OF THE LAW OF TORTS § 32 (4th ed. 1971) (noting that the subjective negligence standard used for children equates closely to moral fault).

146. See Johnson et al., *supra* note 16, at 219 (noting that the prefrontal cortex helps individuals inhibit impulses and organize behavior to reach a goal).

147. Furek, 594 A.2d at 508–12.

148. See Jane Wakefield, *TikTok Skull-breaker Challenge Danger Warning*, BBC (Mar. 4, 2020), <https://www.bbc.com/news/technology-51742854> (on file with the *University of the Pacific Law Review*) (reporting that the TikTok skull-breaker challenge can result in serious injuries).

jury evaluation.¹⁴⁹ Instead, courts invariably analyze these cases under the reasonable adult standard, even if the young adult cannot meet this standard.¹⁵⁰ Morality has historically played a prominent part in shaping public policy and legal doctrine.¹⁵¹ Thus, from a public policy perspective, courts should not apply the reasonable person standard to adolescents who lack the capacity to assess risks as fully mature adults.¹⁵²

Perhaps the most critical issue with the current application of the standard of care for minors is its inflexibility.¹⁵³ Today, the application of the relaxed standard for minors ends with the age of majority.¹⁵⁴ However, early twentieth century courts first developing the relaxed standard for minors recognized the age of majority was not dispositive in determining its application.¹⁵⁵ For example, in 1906, the California Supreme Court applied the relaxed standard of care to a nineteen-year-old girl who sustained injuries operating a fabric machine.¹⁵⁶ The court acknowledged that while the age of majority signals physical maturity, adolescents do not possess the cognitive prowess of fully mature adults.¹⁵⁷ Similarly, in 1873, the Michigan Supreme Court applied the relaxed standard of care to a twenty-year-old girl that collided with a carriage while horse-riding.¹⁵⁸ The Missouri Supreme Court also applied the relaxed standard to an eighteen-year-old boy operating a shoe factory machine in a 1915 case.¹⁵⁹ In its holding, the court noted that “boy[s] 18 or 19 years of age . . . should [not] be held to the full accountability of adult[s].”¹⁶⁰ These cases display how the standard of care for minors developed as a flexible framework, not bound by the constraints of the age

149. GRAY ET AL., *supra* note 15, at 149–50.

150. See generally GRAY ET AL., *supra* note 15; see RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010) (noting that an individual above the age of majority does not receive the benefits of the relaxed standard of care).

151. See James Fishkin, *Moral Principles and Public Policy*, 108 DAEDALUS 55 (1979) (observing that morality “played a major role” in slavery, Prohibition, abortion, affirmative action, and discrimination debates).

152. Johnson et al., *supra* note 16, at 216.

153. RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010).

154. E.g. *Baker v. Helms*, 527 So. 2d 1241, 1244 (Ala. 1988) (applying the reasonable person standard to an eighteen year old defendant); *Congini by Congini v. Portersville Valve Co.*, 470 A.2d 515, 519 (Pa. 1983) (holding that an eighteen year old defendant is “liable as an adult for the offenses which he commits”); *Colwell v. Nygaard*, 8 Wash. 2d 462, 476 (Wash. 1941) (“[P]ersons eighteen years of age should be held to the exercise of the same judgment and discretion in caring for their own safety as persons more advanced in years.”).

155. *Guyer v. Sterling Laundry Co.*, 171 Cal. 761, 764 (1916); *Daniels v. Clegg*, 28 Mich. 32, 34 (1873); *Bulson v. Int’l Shoe Co.*, 191 Mo. App. 128 (1915).

156. See *Guyer*, 171 Cal. At 763 (“[Legal majority] cannot change the facts of existence. . . no one will argue that merely because a [minor]. . . attained legal majority they [are] . . . endowed with the care and discretion and judgment of full maturity.”).

157. *Guyer*, 171 Cal. At 764; see also *Lehmuth v. Long Beach Unified Sch. Dist.*, 53 Cal. 2d 544, 555 (1960) (holding again that “a minor’s age alone, though it be 18 years, does not as a matter of law establish maturity such as to impose upon him or her the standard of care applicable to an adult”).

158. See *Daniels*, 28 Mich. At 40 (noting that the appellate court was correct in considering the age of the girl when deciding whether she exercised reasonable care).

159. *Bulson*, 191 Mo. App. At 130.

160. *Id.* at 130.

of majority.¹⁶¹ It is possible that, over time, courts perceived a risk of inconsistency in applying the standard of care for minors to individuals over eighteen, justifying a departure from this early flexible framework.¹⁶² Notwithstanding, recent scientific insights on adolescent development justify the adoption of a flexible and adaptable standard of care for minors.¹⁶³

B. Science Supports Extending the Negligence Standard of Care for Minors to Age Twenty-Five

Negligence law already recognizes that courts should not hold children to exercise the same degree of care as fully mature adults.¹⁶⁴ Modern courts rely on the age of majority when determining whether to apply the relaxed standard of care.¹⁶⁵ However, a burgeoning body of scientific literature supports the notion that children's cognitive development continues through the mid-twenties.¹⁶⁶ These scientific insights have already influenced criminal law jurisprudence, with the U.S. Supreme Court relying on scientific evidence to recognize the diminished culpability of juvenile offenders.¹⁶⁷ The latest of these Supreme Court cases is *Miller v. Alabama*, where the Court noted juveniles "lack maturity" and "are more vulnerable. . . to peer pressure."¹⁶⁸ The Court further stated, "developments in psychology and brain science continue to show fundamental differences between juvenile and adult minds."¹⁶⁹ Negligence jurisprudence should follow in criminal law's steps and adopt the Supreme Court's view of juvenile offenders in light of

161. *Guyer*, 171 Cal. at 763; *Lehmuth*, 53 Cal. 2d at 550; *Daniels*, 28 Mich. at 34; *Bulson*, 191 Mo. App. at 130.

162. *Guyer*, 171 Cal. at 763; *Lehmuth*, 53 Cal. 2d at 550; *Daniels*, 28 Mich. at 34; *Bulson*, 191 Mo. App. at 130.

163. Johnson et al., *supra* note 16.

164. Gee, *supra* note 21, at 52.

165. *E.g.*, *Baker v. Helms*, 527 So. 2d 1241, 1244 (Ala. 1988) (applying the reasonable person standard to an eighteen year old defendant); *Congini by Congini v. Portersville Valve Co.*, 470 A.2d 515, 518 (Pa. 1983) (holding that an eighteen year old defendant is "liable as an adult for the offenses which he commits"); *Colwell v. Nygaard*, 8 Wash. 2d 462, 476 (Wash. 1941) ("Persons eighteen years of age should be held to the exercise of the same judgment and discretion in caring for their own safety as persons more advanced in years.").

166. Julian G Simmons et al., *Study Protocol: Imaging Brain Development in the Childhood to Adolescence Transition Study (iCATS)*, 14 BMC PEDIATRICS 115 (2014); Ronald E. Dahl, *Adolescent Brain Development: Vulnerabilities and Opportunities*, 1021 ANNALS. N.Y. ACAD. SCIS. 1 (2004); Ronald E. Dahl & Megan R. Gunnar, *Heightened Stress Responsiveness and Emotional Reactivity During Pubertal Maturation: Implications for Psychopathology*, 21 DEV. & PSYCHOPATHOLOGY 1 (2009); Laurence Steinberg, *A Social Neuroscience Perspective on Adolescent Risk-Taking*, 28 DEVELOPMENTAL REV. 78 (2008).

167. *See Roper v. Simmons*, 543 U.S. 551 (2005) (holding that imposing capital punishment to offenders for crimes committed while under the age of eighteen was unconstitutional); *Graham v. Florida*, 560 U.S. 48 (2010) (holding that sentencing juvenile offenders to life imprisonment without parole for non-homicide offenses was unconstitutional).

168. 567 U.S. 460, 490 (2012).

169. *Id.* at 471.

scientific advances.¹⁷⁰ If implemented, negligence courts would judge the behavior of adolescents in the early twenties against their peers of like age, intelligence, and experience.¹⁷¹

Neuroscience research provides a quantitative measure to trends observed in psychology: until age twenty-five, adolescents cannot appropriately assess risk because key brain areas are still developing.¹⁷² An underdeveloped prefrontal cortex links to adolescent propensity for engaging in risky behavior.¹⁷³ Put simply, adolescents are not fully mature in their ability to differentiate between positive and negative rewards until age twenty-five—an ability often called “good judgment.”¹⁷⁴ Because developing adolescents cannot perceive risk like fully mature adults, courts should not hold them to the same standard of care.¹⁷⁵ Given that risk appreciation is essential for determining negligence liability, these insights on prefrontal cortex development provide a basis for expanding the current standard of care for minors.¹⁷⁶

Another key brain region linked to adolescent brain development is the amygdala: a structure responsible for emotional regulation.¹⁷⁷ While the amygdala is well developed at birth, structural and functional changes continue through adulthood.¹⁷⁸ Most strikingly, the neural connections between the amygdala and the prefrontal cortex become denser in late adolescence.¹⁷⁹ This discovery suggests adolescents do not have the ability to properly integrate their emotional and cognitive processes until their mid-twenties.¹⁸⁰ Further, because the amygdala plays an important role in how peer influences impact decision-making, these underdeveloped connections prevent adolescents from properly assessing risk in

170. See generally Grey, *supra* note 67; Eggen & Laury, *supra* note 72, at 235; Eggen, *supra* note 72, at 651.

171. Gee, *supra* note 21, at 53.

172. See Johnson et al., *supra* note 16, at 219 (noting that one key brain area is the prefrontal cortex, which is responsible for long-term planning, controlling impulsive behavior, and analyzing risk); Melissa S. Caulum, *Post-adolescent Brain Development: A Disconnect Between Neuroscience, Emerging Adults, and the Corrections System*, 2007 WIS. L. REV. 729, 743 (2007) (“Evidence shows that the prefrontal cortex does not fully mature until the mid-twenties . . .”).

173. See Anderson, *supra* note 24, at 386 (“The incomplete development of frontal lobes during childhood and adolescence implies that a limited ability to apply effective executive skills may be present.”).

174. *Id.* at 400 (2001); see Alexandra Sifferlin, *Why Teenage Brains Are So Hard to Understand*, TIME (Sept. 8, 2017), <http://time.com/4929170/inside-teen-teenage-brain/> (on file with the *University of the Pacific Law Review*) (noting that adolescents are unable to weigh the pros and cons of their actions).

175. Anderson, *supra* note 24, at 400.

176. *Id.*

177. See Johnson et al., *supra* note 16, at 219 (noting that the amygdala is linked to emotional maturity: “the ability to regulate and to interpret emotions”).

178. *Id.* at 219. *But see generally* Thomas Avino, *Neuron Numbers Increase in the Human Amygdala from Birth to Adulthood, but Not in Autism*, 115 PROC. NAT’L ACAD. SCI. USA 3710 (Apr. 3, 2018) (reporting from childhood to adulthood the amygdala increases in size by 40% and the number of neurons increase by 11%).

179. Johnson et al., *supra* note 16, at 219.

180. See *id.* (referring to this phenomenon as “starting the engine of a car without the benefit of a skilled driver”).

social settings.¹⁸¹ Accordingly, the amygdala's salient role in risk-taking and peer influence, which develops through early adulthood, provides another basis for expanding the current standard of care for minors.¹⁸²

The maturation of the neural connections between the prefrontal cortex and the amygdala is a small part of a much wider process occurring throughout the brain.¹⁸³ During adolescence, the development of gray and white matter helps explain why adolescents tend to engage in riskier behavior than adults.¹⁸⁴ Recent scientific studies also indicate incomplete white matter myelination makes adolescents more vulnerable to peer pressure, and thus more likely to engage in dangerous behavior.¹⁸⁵ These findings corroborate and strengthen previous evidence demonstrating an underdeveloped prefrontal cortex and amygdala hinder risk perception in the adolescent population.¹⁸⁶

One of the most significant conclusions from the scientific literature is that adolescent risk-taking behavior and susceptibility to peer pressure is the norm across the population—not an anomaly.¹⁸⁷ Until age twenty-five, adolescents are categorically worse at weighing the risks and likely consequences of their actions than fully mature adults.¹⁸⁸ This universality gives credence to extending application of the relaxed standard of care for minors through age twenty-five.¹⁸⁹

C. Expanding the Negligence Standard of Care for Minors Comports with Fundamental Principles of Negligence

Negligence law developed from fundamental concepts of societal fault, risk assessment, flexibility, and fairness.¹⁹⁰ Any adjustments to existing negligence standards, then, should comport with these core principles.¹⁹¹ Because courts

181. See Dustin Albert, *The Teenage Brain: Peer Influences on Adolescent Decision Making*, 22 SAGE J. 114, 115 (2013) (discussing how peer influence on teenage behavior is prevalent due, in part, by heightened hormonal influx to the amygdala); Carolyn Johnson et al., *Long-range Orbitofrontal and Amygdala Axons Show Divergent Patterns of Maturation in the Frontal Cortex Across Adolescence*, 18 DEVELOPMENTAL COGNITIVE NEUROSCIENCE 113 (2016) (demonstrating how the amygdala's development from juvenile to adult is a functional remodeling of the fundamental structure of the amygdala).

182. Johnson et al., *supra* note 16, at 219.

183. *Id.*

184. Giedd, *supra* note 117, at 861–63; see also Peter Anderson, *Assessment and Development Executive Function (EF) During Childhood*, 8 CHILD NEUROPSYCHOLOGY 71, 75 (2002) (noting that white matter is composed of myelin, which allows nerve impulses to travel more quickly and efficiently).

185. Dustin Albert, *Peer Influences on Adolescent Decision Making*, 22 CURRENT DIRECTIONS PSYCH. SCI. 114, 116 (2013).

186. Johnson et al., *supra* note 16, at 219.

187. See Casey & Caudle, *supra* note 24, at 82 (noting that lack of impulse control and risk-taking behavior mark adolescent development).

188. Johnson et al., *supra* note 16, at 219; Giedd, *supra* note 117, at 861–63; Albert, *supra* note 181, at 116.

189. Shulman, *supra* note 23, at 618.

190. *Supra* Section II.A.

191. *Supra* Section II.A.

already make special allowances for minors due to their immaturity, extending the standard of care to age twenty-five falls within the concept of societal fault.¹⁹² As evidenced by their propensity for risky behavior and susceptibility to peer pressure, adolescents are unable to properly assess the risks of their actions like fully mature adults.¹⁹³ Thus, it is unfair to hold adolescents under twenty-five to the same standard of care as fully mature adults.¹⁹⁴ Finally, negligence law's intrinsic ability to change in response to scientific and cultural progress provides another basis for extending the current standard of care for minors.¹⁹⁵ While negligence law has been slow to respond to recent neuroscientific advances, it can easily adapt the frameworks developed from Supreme Court decisions on juvenile criminal justice.¹⁹⁶ As the scientific community's understanding of adolescent development continues to evolve, so should negligence law.¹⁹⁷

D. Expanding the Negligence Standard of Care for Minors Does Not Significantly Frustrate Negligence Law's Goals of Victim Compensation and Deterrence

The primary aims of negligence law are to compensate victims and deter individuals from engaging in unsafe conduct.¹⁹⁸ It is within these goals that negligence liability principles of fault, risk assessment, flexibility, and fairness intersect.¹⁹⁹ However, there is a natural tension between negligence law's core principles and goals.²⁰⁰ Expanding the relaxed standard of care for minors to age twenty-five illustrates this tension.²⁰¹ On the one hand, expanding the standard of care for minors will more closely equate culpability to negligence liability.²⁰² Courts will judge the conduct of young adults based on other young adults of like age, intelligence, and experience while accounting for fault, risk perception, and fairness.²⁰³ Conversely, expanding the standard of care for minors could

192. See Shulman, *supra* note 23, at 618 (noting that society does not expect minors to exercise the same degree of care as adults due to their cognitive immaturity).

193. Anderson, *supra* note 24, at 400; Johnson et al., *supra* note 16; Casey & Caudle, *supra* note 24, at 82.

194. Keating, *supra* note 60, at 33.

195. GRAY ET AL., *supra* note 15, at 48.

196. *Roper*, 543 U.S. at 551; *Miller v. Alabama*, 567 U.S. 460 (2012).

197. See generally Grey, *supra* note 67, at 693; Eggen & Laury, *supra* note 72, at 294–95; Eggen, *supra* note 72, at 642–43.

198. GRAY ET AL., *supra* note 15, at 52–53.

199. *Id.*

200. *Id.* (noting that if liability matched culpability, “a greatly increased number of victims would go uncompensated”).

201. *Id.*

202. See GRAY ET AL., *supra* note 15, at 52–53 (observing that negligence liability should attach to those individuals guilty of a moral shortcoming but not those who are free from blame).

203. Gee, *supra* note 21, at 53.

theoretically impose a higher financial burden on victims and promote unsafe conduct.²⁰⁴ While these concerns are valid, they are readily addressed by current safeguards in negligence law.²⁰⁵

Courts expect increased maturity from minors as they age; in most cases involving young adults, applying the relaxed standard will likely not yield a different result.²⁰⁶ Notably, expanding the relaxed standard of care to age twenty-five will make a legal difference exactly where it should—cases involving risk perception and peer pressure.²⁰⁷ The adult activities doctrine provides another safeguard for protecting victims' financial interests and deterring unsafe conduct.²⁰⁸ Given the large umbrella of conduct covered under the adult activities doctrine, the reasonable adult standard will continue to feature prominently in negligence cases involving young adults.²⁰⁹

VI. THE ADULT ACTIVITIES DOCTRINE

Courts have identified two main policy rationales for implementing the adult activities exception to the minor standard of care: insurance and victims' reasonable expectations.²¹⁰ The insurance rationale posits that because adult activities normally require insurance, children engaging in these activities do not need protection from liability.²¹¹ But not all adult activities require insurance; thus, the reasonable expectations rationale fills the gaps.²¹² The reasonable expectations rationale proposes that victims expect individuals engaging in adult activities, regardless of age, to exercise the care of a reasonable adult.²¹³ Together, the insurance and reasonable expectations rationales justify imposing an adult standard on children for injuries resulting from adult activities.²¹⁴

204. GRAY ET AL., *supra* note 15, at 52–53.

205. *Id.*

206. *See* Dorais v. Paquin, 304 A.2d 369, 372 (N.H. 1973) (“The closer a child comes to majority, and the more common and obvious the risk, the more likely it is that the youth will be held to the adult standard of care.”); Hamilton v. Southern Nevada Power Co., 273 P.2d 760 (Nev. 1954) (finding a 16-year old who hit a power line with a pipe negligent because he was capable of appreciating the risk of his actions); Heinis v. Lawrence, 71 N.W. 2d 127 (Neb. 1955) (finding that a 17-year-old did not act with ordinary care when jumping off the back of a grain truck onto the road). *But see* Goss v. Allen, 360 A.2d 388, 388–89 (N.J. 1976) (judging a 17-year-old novice skier under the relaxed standard of care for minors due to his inexperience).

207. Johnson et al., *supra* note 16, at 219.

208. *See generally* Binchy, *supra* note 91.

209. *See* RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010) (noting that courts consider adult activities the operation of any motor vehicle, handling of firearms, and engaging in sports such as golfing).

210. Binchy, *supra* note 91, at 761–65.

211. *Id.* at 761–62; *see also* Bruce Dunlop, *Torts Relating to Infants*, 5 W. L. REV. 116, 119 (1966) (“[I]n view of the availability of liability insurance. . .the child should be held to the standard of an adult.”).

212. *See* Binchy, *supra* note 91, at 762 (noting that the insurance rationale loses credibility “once we leave the highway”).

213. *Id.* at 762–64.

214. *Id.* at 761–69.

While these rationales are not immune from criticism, their widespread acceptance cements the adult activities doctrine's place in negligence law.²¹⁵ Further, these rationales would continue applying with equal force should courts expand the relaxed standard of care to age twenty-five.²¹⁶ Due to young adults' proximity to full cognitive maturity, the apparent injustice of imposing an adult standard on young adults for adult activities becomes less concerning.²¹⁷ With respect to insurance, "all states have financial responsibility laws" for motor vehicle drivers, usually requiring drivers to obtain auto insurance.²¹⁸ In the future, states may also begin requiring firearm liability insurance.²¹⁹ Young adults engaging in these adult activities would not need protection from liability.²²⁰ Finally, society reasonably expects young adults, compared to their younger counterparts, to exercise greater care when engaging in adult activities.²²¹ Given these considerations, expanding the negligence standard of care would smoothly integrate the adult activities doctrine.²²²

VII. DUAL STANDARD: THE STANDARD OF CARE FOR MINORS AND CONTRIBUTORY NEGLIGENCE

Before the advent of comparative negligence, traditional negligence doctrine established contributory negligence as a complete bar to recovery.²²³ Thus, a dual standard arose early in negligence jurisprudence: minor plaintiffs would receive the benefit of the relaxed standard of care while courts would judge minor defendants under the reasonable adult standard.²²⁴ While the doctrine of comparative negligence weakened the dual standard regime, the adult activities doctrine remains a driving force for applying the adult standard to minor

215. *See id.* (criticizing the insurance rationale as limited in application and the reasonable expectations rationale as ignoring the "contingent and surprising ways in which accidents occur when minors are engaging in childhood activities").

216. *Id.*

217. *Id.* at 754–55; *see Dorais v. Paquin*, 304 A.2d 369, 372 (1973) ("The closer a child comes to majority, and the more common and obvious the risk, the more likely it is that the youth will be held to the adult standard of care.").

218. Insurance Information Institute, *Is It Legal to Drive Without Insurance?*, <https://www.iii.org/article/is-it-legal-to-drive-without-insurance> (last visited May 26, 2022) (on file with the *University of the Pacific Law Review*).

219. *See* The Associated Press, *California City Approves 1st US Insurance Law for Gun Owners*, ABCNEWS (Jan. 26, 2022), <https://abcnews.go.com/Politics/wireStory/california-city-approves-1st-us-insurance-law-gun-82479307> (on file with the *University of the Pacific Law Review*) (reporting that San Jose became the first city to require gun owners to carry liability insurance in January of 2022).

220. Binchy, *supra* note 91, at 761–69.

221. *Id.*; GRAY ET AL., *supra* note 15, at 149 (noting that child defendant must technically be a minor for the relaxed standard of care to apply).

222. Binchy, *supra* note 91, at 761–69.

223. RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010).

224. *Id.* ("[W]hile the circumstance of childhood should not preclude the liability of an evidently negligent child defendant for harm caused, this circumstance should not defeat the tort claim of the child victimized by the negligence of a third-party adult.").

defendants.²²⁵ Notwithstanding, the literature shows most negligence cases involving minors deal with contributory negligence.²²⁶ Extending the relaxed standard of care to age twenty-five could justify a resurgence of the dual standard in contributory negligence cases.²²⁷ At a minimum, negligence plaintiffs under twenty-five should receive the benefits of the relaxed standard.²²⁸ This dichotomy will have the most impact in states where contributory negligence is still a complete bar to recovery for plaintiffs: Alabama, Maryland, North Carolina, Virginia, and Washington, D.C.²²⁹

VIII. CHALLENGES OF EXTENDING THE NEGLIGENCE STANDARD OF CARE FOR MINORS TO AGE TWENTY-FIVE

While neuroscience advances could lead to more refined negligence standards, it is critical to recognize important caveats of expanding the current standard of care for minors.²³⁰ Section A explores societal expectations of young adults through a public policy lens.²³¹ Section B discusses the limitations of using neuroscience data in the courtroom, including evidentiary and pragmatic concerns.²³² Section C describes why, despite these limitations, neuroscience should lead to reform negligence doctrine by expanding the standard of care for minors.²³³

A. Society Largely Expects Adolescents Over Eighteen to Behave Like Fully Mature Adults

While society is beginning to recognize that adolescents do not have the cognitive prowess of fully mature adults, public policy still largely dictates societal expectations.²³⁴ America's enshrinement of age eighteen as a signal of adulthood

225. Binchy, *supra* note 91, at 747–49 (1985); *see also* RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010) (noting that comparative negligence merely diminishes recovery and juries attach less weight to the negligence of younger parties).

226. GRAY ET AL., *supra* note 15, at 150.

227. RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010).

228. RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010).

229. *Comparative & Contributory Negligence in Personal Injury Cases*, JUSTIA, <https://www.justia.com/injury/negligence-theory/comparative-contributory-negligence/> (last visited May 19, 2022) (on file with the *University of the Pacific Law Review*).

230. Johnson et al., *supra* note 16, at 216.

231. *Infra* Section VII.A.

232. *Infra* Section VII.B.

233. *Infra* Section VII.C.

234. Twenge, *supra* note 99, at 645.

permeates many areas of law.²³⁵ Negligence doctrine is no exception.²³⁶ Expanding the negligence standard of care for minors to age twenty-five will challenge this status quo.²³⁷ However, it would not be the first time public policy recognized young adults lack cognitive maturity.²³⁸ Car rental companies historically did not rent cars to drivers under twenty-five years of age; today, most charge high daily underage fees for these services.²³⁹ Similarly, the Constitution contains several age of candidacy requirements.²⁴⁰ One notable example is candidacy for the House of Representatives, which holds a minimum age requirement of twenty-five years.²⁴¹ Once ahead of their time, these policies now match neuroscience research on adolescent development.²⁴² Conversely, laws codifying age eighteen as a manifestation of cognitive maturity represent a systemwide failure to account for recent neuroscience advances.²⁴³ It is time for a comprehensive overhaul of age-based presumptions within the legal system.²⁴⁴

B. Evidentiary and Pragmatic Concerns of Using Neuroscience Data in the Courtroom

The primary evidentiary concern of implementing neuroscience data in negligence cases is reliability.²⁴⁵ Particularly, extrapolating the knowledge derived from generalized studies to specific cases will call into question the accuracy of neuroscience technology.²⁴⁶ Because the bounds of normal development vary from

235. See *Life-Changing Privileges of Turning 18*, L. DICTIONARY, <https://thelawdictionary.org/article/privileges-of-turning-18/> (last visited Oct. 15, 2022) (on file with the *University of the Pacific Law Review*) (observing that turning eighteen grants an individual a number of privileges, including the ability to enter into a contract, vote in elections, join the military, and make personal medical decisions).

236. See GRAY ET AL., *supra* note 15, at 149 (alluding to the concept that the child defendant must technically be a minor under eighteen for the child standard of care to apply); RESTATEMENT (THIRD) OF TORTS § 10 (AM. L. INST. 2010) (noting that an individual above the age of majority does not receive the benefits of the relaxed standard of care).

237. *Life-Changing Privileges of Turning 18*, *supra* note 235; see also GRAY ET AL., *supra* note 15, at 37 (observing that negligence law must comport with community expectations).

238. Molly Feltner, *Renting a Car Under Age 25 Is Possible, but Pricey*, SMARTERTRAVEL (May 10, 2019), <https://www.smartertravel.com/renting-a-car-under-age-25-is-possible-but-pricey/> (on file with the *University of the Pacific Law Review*).

239. See *id.* (citing adolescent propensity for risky driving as the reason for these policies).

240. E.g., U.S. CONST. art. II, § 1 (declaring that presidential and vice-presidential candidates must be at least thirty-five years old).

241. U.S. CONST. art. I, § 2.

242. Johnson et al., *supra* note 16, at 216.

243. *Id.*

244. See generally Clare Ryan, *The Law of Emerging Adults*, 97 WASH. U.L. REV. 1131 (2020) (proposing that young adults should be treated as a distinct legal category, separate from fully mature adults).

245. See Johnson et al., *supra* note 16, at 221 (“[N]euroimaging studies do not allow a chronologic cut-point for behavioral or cognitive maturity at either the individual or population level.”).

246. See Henry T. Greely, *Neuroscience, Mindreading, and the Courts: The Example of Pain*, 18 J. HEALTH CARE L. & POL’Y 171, 183 (2015) (“It is unlikely that everyone’s brain will react the same way to exactly the same stimulus, particularly with a complex stimulus or behavior.”).

person to person, relying on neuroscience data may result in false positives or false negatives.²⁴⁷ A court evaluating negligence may erroneously attribute peer-pressure-susceptibility to an adolescent's conduct when, in fact, this trait did not dictate their actions.²⁴⁸ However, the trier-of-fact bears the burden of assessing all the relevant evidence to determine whether an individual breached their standard of care.²⁴⁹

While fact finders play a vital role in determining negligence liability, their role is vulnerable to pollution from neuroscience data's purported objectivity.²⁵⁰ Put simply, fact-finders are more likely to find neuroscience data credible because they believe neuroscience is objective.²⁵¹ Because neuroscience also involves elements of subjectivity, courts may be reluctant to introduce neuroscience evidence in the courtroom.²⁵² Federal Rule of Evidence 403 allows courts to "exclude relevant evidence if its probative value is substantially outweighed" by dangers of unfair prejudice or misleading the jury.²⁵³ If history is any indication, neuroscience data on adolescent development will likely overcome this hurdle.²⁵⁴

From a pragmatic standpoint, expanding the relaxed standard of care for minors to age twenty-five faces two major hurdles: expert testimony use and administrative burdens.²⁵⁵ While federal courts exclusively rely on the comprehensive *Dauber* test to determine the admissibility of expert evidence, state courts are split between *Dauber* and the lenient *Frye* test.²⁵⁶ This dichotomy will result in forum shopping and inequitable results in negligence cases involving

247. *Id.*

248. *Id.*

249. GRAY ET AL., *supra* note 15, at 108–09.

250. See Johnson et al., *supra* note 16, at 221 ("Despite being popularly viewed as revealing the 'objective truth,' neuroimaging techniques involve an element of subjectivity.").

251. See David McCabe, *Seeing Is Believing: The Effect of Brain Images on Judgments of Scientific Reasoning*, 107 COGNITION 343, 343 (2008) (finding subjects who read a story embedding neuroscience images found it more compelling than stories lacking neuroscience data); Deena Weisberg, *The Seductive Allure of Neuroscience Explanations*, 20 J. COGNITIVE NEUROSCIENCE 470, 470 (2008) (finding that even referring to neuroscience data verbally, even when logically irrelevant, increases persuasiveness). *But see* Nicholas J. Schweitzer, *Neuroimages as Evidence in a Mens Rea Defense: No Impact*, 17 PSYCH. PUB. POL'Y & L. 357, 357 (2011) (finding in criminal settings that neuroimaging data did not unduly influence juries compared to verbal references of neuroscience data).

252. See Johnson et al., *supra* note 16, at 220 (noting neuroscience data highlight correlations rather than causations and that research techniques depend on the investigator's preferences).

253. FED. R. EVID. 403.

254. See David Seminowicz et al., *Panel 1: Legal and Neuroscientific Perspectives on Chronic Pain*, 18 J. HEALTH CARE L. & POL'Y 207, 231 (2015) (citing similar concerns to the initial use of DNA, forensic science, and ballistics evidence in the legal system, which eventually became commonplace in the courtroom).

255. See generally Darby Aono, *Neuroscientific Evidence in the Courtroom: A Review*, 4 COGNITIVE RSCH: PRINCIPLES & APPLICATIONS 45 (2019).

256. See Anjelica Cappellino, *Daubert vs. Frye: Navigating the Standards of Admissibility for Expert Testimony*, EXPERT INST. (Sept. 7, 2021), <https://www.expertinstitute.com/resources/insights/daubert-vs-frye-navigating-the-standards-of-admissibility-for-expert-testimony/> (on file with the *University of the Pacific Law Review*) (noting that the *Dauber* test requires a comprehensive balancing of factors while the *Frye* test only asks whether the expert opinion is "generally accepted" as reliable in the relevant scientific community).

young adults.²⁵⁷ Additionally, increased reliance on neuroscience expert testimony in the courtroom will disadvantage litigants who cannot afford to produce this evidence.²⁵⁸ Because scientific expert testimony will become commonplace in negligence cases involving young adults, there may be a higher administrative burden on the courts.²⁵⁹ However, as more neuroscience evidence floods the courtrooms, courts will become more experienced in tackling this domain.²⁶⁰

C. Despite These Limitations, Neuroscience Should Reform Negligence Doctrine

Expanding the negligence standard of care for minors to age twenty-five will require overcoming evidentiary and pragmatic hurdles, as well as societal expectations of adolescent behavior.²⁶¹ However, these limitations do not justify completely barring neuroscience evidence in negligence cases involving young adults.²⁶² As neuroscience continues to evolve, so will its legal value.²⁶³ In the courtroom, neuroscience evidence on adolescent development should be one of many factors courts will consider to determine negligence liability.²⁶⁴ Further, adopting robust jury instructions will alleviate the prejudicial concerns of using complex neuroscience data.²⁶⁵ Although neuroscience evidence on its own will not define negligence liability, it will provide adolescents greater access to justice in cases hinging on risk perception and peer pressure.²⁶⁶

IX. CONCLUSION

Recent neuroscience advances show that adolescents under twenty-five years old are cognitively different than fully mature adults; a difference carrying legal significance.²⁶⁷ Adolescent faulty risk-perception and susceptibility to peer pressure are necessary components of their development to adulthood.²⁶⁸ Now that

257. *Id.*

258. See *Expert Witness Fees: How Much Does an Expert Witness Cost?*, SEAK, <https://blog.seakexperts.com/expert-witness-fees-how-much-does-an-expert-witness-cost/> (last visited Oct. 15, 2022) (on file with the *University of the Pacific Law Review*) (noting that expert testimony generally requires an up-front retainer and that the median fee is \$2,000).

259. Cosgrove, *supra* note 68, at 438–39 (2015).

260. *Id.*

261. *Supra* Section VII.B.

262. *Supra* Section VII.B.

263. See generally Johnson et al., *supra* note 16.

264. See GRAY ET AL., *supra* note 15, at 112 (“Age, sex, color, temperament, indifference, courage, intelligence, power of observation, judgment, quickness of reaction, self control, imagination, memory, deliberation, prejudices, experience, health, education, ignorance, attractiveness, weakness, strength, poverty, and any of the other possible assortments of qualities and characteristics of the persons involved may each be a factor in the jury’s judgment on the negligence issue.”)

265. *Id.*

266. Johnson et al., *supra* note 16.

267. Johnson et al., *supra* note 16.

268. See Casey & Caudle, *supra* note 24, at 84 (noting that lack of impulse control and risk-taking behavior

neuroscience has established the baseline knowledge to develop a new framework, negligence law should follow suit.²⁶⁹ Accordingly, courts should extend application of the negligence standard of care for minors to age twenty-five.²⁷⁰ While there are limitations to this proposal, neuroscience will only become more sophisticated and more prevalent with time.²⁷¹ As neuroscience begins to infiltrate negligence doctrine, courts will need to balance the scientific literature with the social, administrative, and ethical goals of negligence law.²⁷²

mark adolescent development).

269. Johnson et al., *supra* note 16.

270. Gee, *supra* note 21, at 54.

271. *Supra* Part VI.

272. *Supra* Part II.