

Comments:

Mother, May I Give a DNA Sample? The Incapacity of Juvenile Offenders and Suspects to Consent to Abandoned DNA Collection

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ABSTRACT

Deoxyribonucleic acid (“DNA”), the “genetic blueprint” for almost all living creatures, recently has become a critical tool for law enforcement in solving crimes. Law enforcement often collects DNA from hair, saliva, or other bodily fluids left on items suspects later discard, such as cigarette butts or water bottles. Law enforcement then uses the “abandoned” DNA to identify perpetrators of crimes. The U.S. Supreme Court has held that the practice of using abandoned DNA does not run afoul of the Fourth Amendment’s protection against unreasonable searches and seizures, relying on *California v. Greenwood*’s holding that an individual cannot possess a reasonable expectation of privacy in trash. Thus, courts presume that suspects who discard trash in police stations have consented to collection of their DNA.

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The U.S. Supreme Court has not, however, examined the Fourth Amendment implications of collecting abandoned DNA from juvenile suspects. Neuroscience research over the last decade indicates that adolescents' brains do not finish maturing until as late as age 25. Consent to a search must be knowing, intelligent, and voluntary; but during the years of adolescence, the faculties controlling knowledge, intelligence, and voluntariness have not yet fully developed. The adolescent brain's underdeveloped capacity for future orientation, reward circuitry, impulse control, and executive function make consent to abandoned DNA collection impossible.

This Comment explains how law enforcement collects and uses DNA, particularly abandoned DNA, to solve crimes. A discussion of the Supreme Court's abandoned DNA jurisprudence regarding collection from adult suspects and a review of the salient differences in the adolescent brain affecting ability to consent will follow. In light of the neurological differences between juveniles and adults, courts should adopt a bright-line rule that juvenile suspects as a class do not have the capacity to consent to the collection of their abandoned DNA.

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I. INTRODUCTION

In August 2018, New York City Police Department (NYPD) detectives questioned a 12-year-old boy at a New York City precinct, suspecting that the boy had been involved in a felony.¹ While the detectives questioned him, the boy sipped a McDonald's soda the detectives had offered him.² The police did not charge the boy with a crime or take him into custody, so the boy left the precinct.³ After the boy left, detectives removed the soda cup from the interrogation room and tested the straw to recover a sample of the boy's DNA.⁴ Once the officers had obtained the boy's DNA sample, they entered the sample's information into the NYPD genetic database.⁵ However, the boy's DNA did not match any of the DNA found at the crime scene.⁶ Prosecutors never charged the boy with a crime, yet the NYPD kept his DNA profile in the database for over a year.⁷ The profile was only removed from the database after a lengthy court battle, in which the boy's family petitioned the court to remove the profile.⁸

1. See Jan Ransom & Ashley Southall, *N.Y.P.D. Detectives Gave a Boy, 12, a Soda. He Landed in a DNA Database*, N.Y. TIMES (Aug. 15, 2019), <https://nyti.ms/3lZatv4>.

2. *See id.*

3. *See id.*

4. *See id.*

5. *See id.* The Office of the Chief Medical Examiner builds and maintains the city's DNA database. *See id.* The state operates a separate database, which requires a conviction before law enforcement can enter DNA into the database. *See id.* However, local authorities are not subject to state rules. *See id.*

6. *See id.*

7. *See id.*

8. *See id.*

On a Saturday night in March 2015, a similar scene unfolded in Florida.⁹ Five teenage boys sat in a parked car in a gated community when a police officer arrived and questioned the boys about car break-ins in the area.¹⁰ The officer abruptly asked the boys which one of them wanted to give a DNA sample.¹¹ Fifteen-year-old Adam agreed to provide a sample, because, as he explained later, he thought he “had to.”¹² After learning that Adam had provided a sample, Adam’s father contacted the police department in an effort to have the sample destroyed.¹³ Officers refused to destroy the sample despite Adam’s father’s objections, claiming that Adam’s consent—per police department policy—allowed the police to retain the sample.¹⁴

While the young boy from New York and Adam from Florida interacted with different police departments and officers, both found themselves part of a growing trend—law enforcement’s use of DNA evidence to solve otherwise unsolvable crimes.¹⁵ In particular, law enforcement officers use “abandoned” DNA a suspect inadvertently leaves behind on objects or surfaces for comparison to DNA collected from a victim or left at the scene of a crime.¹⁶ Given juvenile suspects’ limited capacity to relinquish their constitutional rights, such suspects are especially vulnerable to abandoned DNA collection.¹⁷ Specifically, collecting samples from juvenile suspects may implicate the Fourth Amendment’s prohibition against unreasonable searches and seizures.¹⁸ Typically, the Fourth Amendment requires law enforcement to obtain a warrant before conducting a search.¹⁹ However, law enforcement need not secure a warrant if the suspect gives knowing, intelligent, and voluntary consent to the search.²⁰ In order to assess whether a suspect’s consent meets this standard, courts examine the totality of the circumstances surrounding the consent.²¹ A juvenile suspect that does not understand the full range of consequences for providing a DNA sample cannot give knowing, intelligent, and voluntary consent to providing a

9. See Lauren Kirchner, *DNA Dragnet: In Some Cities, Police Go from Stop-and-Frisk to Stop-and-Spit*, PROPUBLICA (Sept. 12, 2016, 8:00 A.M.), <http://bit.ly/38SGAG8>.

10. See *id.*

11. See *id.*

12. *Id.*

13. See *id.*

14. See *id.*

15. See discussion *infra* Section II.A.

16. See discussion *infra* Section II.A.

17. See discussion *infra* Part III.

18. See discussion *infra* Section II.B.1.

19. See discussion *infra* Section II.B.2.b.

20. See discussion *infra* Section II.B.2.b.

21. See discussion *infra* Section II.B.2.b.

sample.²² Accordingly, this Comment discusses the constitutionality of abandoned DNA collection from juvenile suspects.

Part II of this Comment addresses how law enforcement uses DNA to solve crimes.²³ Next, Part II addresses the Fourth Amendment implications of collecting DNA from suspects who ultimately are not charged or convicted.²⁴ Part II also discusses the comparison of “abandoned” DNA to trash that has led the United States Supreme Court to conclude that for adults, collection of inadvertently discarded DNA is not a “search” for Fourth Amendment purposes.²⁵ Finally, Part II introduces relevant neurological differences between juveniles and adults.²⁶

Part III explains how delayed development of certain structures in juveniles’ brains renders juvenile suspects unable to consent to abandoned DNA collection.²⁷ Deficiencies in future orientation, the increased salience of rewards, difficulties with impulse control, and developing executive functions make it impossible for juveniles to give knowing, intelligent, and voluntary consent.²⁸ Part III argues that courts should dispense with the current totality of the circumstances analysis for voluntary consent and instead adopt a bright-line rule that juvenile suspects, as a class, do not have the capacity to consent to abandoned DNA collection.²⁹

II. BACKGROUND

Despite their differences, the young boy in New York and Adam in Florida had this much in common—their DNA told law enforcement officers more about them than words ever could.³⁰ DNA, the hereditary material found in humans, contains unique instructions for building and maintaining an organism.³¹ And as new technology develops, law enforcement increasingly uses DNA as a crime-solving tool.³² Using DNA to solve crimes, however, poses critical constitutional questions.³³

22. See discussion *infra* Part III.

23. See discussion *infra* Section II.A.

24. See discussion *infra* Section II.B.

25. See discussion *infra* Section II.B.

26. See discussion *infra* Section II.D.

27. See discussion *infra* Section III.A.

28. See discussion *infra* Section III.A.

29. See discussion *infra* Section III.B.

30. See, e.g., *People v. K.N.*, 87 N.Y.S. 3d 862, 866 (Crim. Ct. 2019).

31. See *What Is DNA?*, NAT’L INSTS. OF HEALTH: U.S. NAT’L LIBR. OF MED., <http://bit.ly/34k4d7b> (last visited Oct. 28, 2019).

32. See *Advancing Justice Through DNA Technology: Using DNA to Solve Crimes*, U.S. DEP’T OF JUST. ARCHIVES, <http://bit.ly/2Pzal7D> (last updated Mar. 7, 2017).

33. See *Taking the DNA of Arrestees: Protecting the Public or Violating the 4th Amendment?*, DNA FORENSICS, <http://bit.ly/38R4jGC> (last visited Dec. 18, 2019).

The Constitution's Fourth Amendment protects individuals from "unreasonable" searches and seizures.³⁴ The Supreme Court has concluded that DNA collection is not an unreasonable search for adult offenders and suspects.³⁵ Despite considering brain development in juvenile sentencing cases such as *Roper v. Simmons*,³⁶ *Graham v. Florida*,³⁷ and *Miller v. Alabama*,³⁸ the Court has not explicitly addressed the differences between adults and juveniles in its analysis of DNA collection.³⁹

A. *DNA Basics: Collection, Storage, and Use by Law Enforcement*

DNA collection is an important crime-solving tool because of the unique information a DNA profile provides.⁴⁰ Forensic scientists refer to DNA as a "genetic blueprint."⁴¹ This nickname comes from the fact that for human beings, DNA contains information that determines an array of physical characteristics.⁴² The area of the genetic code that determines these characteristics, the "coding region," encompasses just 2% of all

34. See U.S. CONST. amend. IV.

35. See *Maryland v. King*, 569 U.S. 435, 462 (2013) (holding that collection of DNA via buccal swab upon arrest was a reasonable "search" pursuant to the Fourth Amendment for adult suspect).

36. See *Roper v. Simmons*, 543 U.S. 551, 553 (2005). *Roper* held that the Eighth Amendment prohibition against cruel and unusual punishment requires courts to reject imposing the death penalty on offenders under 18 years of age, citing three differences between juveniles and adults that make the death penalty cruel and unusual for juveniles. See *id.*; see also discussion *infra* Section II.D.1.

37. See *Graham v. Florida*, 560 U.S. 48, 68 (2010). In *Graham*, the Supreme Court decided that courts could not sentence juvenile offenders to life without parole for non-homicide offenses. See *id.* at 74. The Court cited the "fundamental differences between juvenile and adult minds," pointing out that juveniles are more capable of change than adults and their actions are less likely to be evidence of "irretrievably depraved character." *Id.* at 68.

38. See *Miller v. Alabama*, 567 U.S. 460, 489 (2012). In *Miller*, the Supreme Court held that a mandatory sentencing scheme in which all children convicted of homicide received lifetime incarceration without the possibility of parole violated the Eighth Amendment's ban on cruel and unusual punishment. See *id.* The Court again cited neuroscience research to highlight differences between juveniles and adults, noting that juveniles' "transient rashness, proclivity for risk, and inability to assess consequences" lessened their moral culpability and courts should consider what sentence to impose on a case-by-case basis. *Id.* at 471.

39. See Kevin Lapp, *Young Adults and Criminal Jurisdiction*, 56 AM. CRIM. L. REV. 357, 374 (2019).

40. See *A Simplified Guide to DNA Evidence: Principles of DNA Evidence*, NAT'L FORENSIC SCI. TECH. CTR., <http://bit.ly/2PFbOJs> [hereinafter *DNA Evidence: Principles*] (last visited Dec. 18, 2019).

41. See *id.*

42. For example, a blueprint for a house specifies the number and positions of exterior windows. Similarly, DNA specifies an array of physical characteristics, such as hair color, eye color, and height. See Joel C. Eissenberg, *Epigenetics: Modifying the Genetic Blueprint*, 111 MO. MED. 5, Sept./Oct. 2014, at 428.

human DNA.⁴³ The function of the other 98% of human DNA, the non-coding region, has not always been clear to the scientific community.⁴⁴ In fact, scientists previously called non-coding DNA “junk” DNA, vernacular that persists today.⁴⁵

Since the middle-to-late 1990s, law enforcement has used the non-coding regions of DNA, previously thought to have no practical use, to identify criminals.⁴⁶ Non-coding DNA is made up of a series of numbers which, alone, can tell nothing about a person’s distinct genetic makeup.⁴⁷ The specific numbers in the sequence of non-coding DNA, however, are unique to a particular individual.⁴⁸ Thus, an individual’s DNA profile can be linked to identifiers such as name, birthday, and social security number;⁴⁹ which law enforcement can use to identify a person with near certainty.⁵⁰

Law enforcement officials refer to DNA evidence as “the greatest innovation in local law enforcement since the bulletproof vest.”⁵¹ To use DNA to solve crimes, police must collect an individual’s DNA using one of the available methods. One such method involves “reference samples.”⁵² Reference samples come from a known person, such as an arrestee or victim.⁵³ Law enforcement officials can collect reference samples in a clinical setting, such as a blood draw, or in a non-clinical setting with a saliva or buccal sample.⁵⁴ Police then compare reference samples with DNA found at the scene of a crime.⁵⁵ While reference samples serve an important crime-solving function, law enforcement has found new uses for “abandoned” DNA samples, raising a new set of constitutional concerns.⁵⁶

Abandoned DNA is “DNA that is inadvertently separated from an individual’s body and later collected, stored, and used by law

43. See *DNA Evidence: Principles*, *supra* note 40.

44. See *id.*

45. See Stephen S. Hall, *Hidden Treasures in Junk DNA*, *SCI. AM.* (Oct. 1, 2012), <http://bit.ly/2PW3fZk>.

46. For more information, see generally National Institute of Justice, *What Is STR Analysis?*, *NAT’L INST. OF JUST.*, (Mar. 2, 2011), <http://bit.ly/2WLaDJV>.

47. See D.H. Kaye & Michael E. Smith, *DNA Identification Databases: Legality, Legitimacy, and the Case for Population-Wide Coverage*, 2003 *WIS. L. REV.* 413, 431–32 (2003).

48. See *id.* at 431.

49. See *id.*

50. See *id.*

51. Kirchner, *supra* note 9.

52. See *id.*

53. See MING W. CHIN ET AL., *FORENSIC DNA EVIDENCE: SCIENCE AND THE LAW* § 3:2 (2019).

54. See *id.*

55. See *id.*

56. See *id.*

enforcement.”⁵⁷ To the benefit of police investigation, suspects can unintentionally leave behind DNA on virtually any surface.⁵⁸ For example, a seemingly innocuous offer of a cigarette or water from a police officer is often a calculated effort to collect a DNA sample that can later be used in the investigation and prosecution of crimes.⁵⁹ Obtaining untainted DNA samples is a common objective for police, to avoid later concerns arising from the evidence’s chain of custody.⁶⁰

To facilitate investigations, law enforcement officers keep and store DNA profiles⁶¹ in a three-tiered hierarchical system of information-sharing called the Combined DNA Index System (CODIS).⁶² The lowest tier of the CODIS is the Local DNA Index System (LDIS),⁶³ the initial point of entry for most samples to become part of the CODIS system.⁶⁴ A local laboratory⁶⁵ can maintain its own local database and upload approved profiles to the middle tier, the state’s DNA Index System (SDIS).⁶⁶ The highest tier, the National DNA Index System (NDIS), has the most stringent accuracy requirements for its samples.⁶⁷ NDIS limits

57. Elizabeth Joh, *Reclaiming “Abandoned” DNA: The Fourth Amendment and Genetic Privacy*, 100 N.W.U. L. REV. 857, 859 (2006).

58. *See id.*

59. *See* Joseph Goldstein, *Before Lifting DNA, Meticulous Protocol*, N.Y. TIMES (Aug. 28, 2012), <https://nyti.ms/2qfsgp9>. For example, the New York City Police Department provides a comprehensive guide for its officers to lift DNA samples from surfaces without the possibility of contamination. *See id.* The guide instructs officers to clean surfaces the suspect may touch with a solution consisting of a ten-to-one ratio of water and bleach, open a new pack of cigarettes or gum before offering one to the suspect, and to “maintain unbroken eye contact” with the sample until it can be collected. *See id.*

60. *See id.*

61. A DNA “profile” refers to the set of identification characteristics or numerical representation at each of the various loci analyzed. *See Frequently Asked Questions on CODIS and NDIS*, FBI, <http://bit.ly/2Q6t4G2> (last visited Dec. 19, 2019). In contrast, a DNA “sample” refers to the biological evidence collected from the suspect or arrestee at the scene. *See id.*

62. *See id.*

63. *See* DEP’T OF JUST.: OFF. OF THE INSPECTOR GEN., THE COMBINED DNA INDEX SYSTEM 4, 42–43 (Sept. 2001), <https://bit.ly/3tZj57S>.

64. *See id.*

65. *See Forensic DNA Education for Law Enforcement Decision Makers: Partial Matches, Local DNA Index System (LDIS)*, NAT’L FORENSIC SCI. TECH. CTR., <http://bit.ly/3t1DtVj> (last visited Feb. 1, 2021) (describing the “Palm Beach County Sheriff’s Office Crime Laboratory” as an example of a local laboratory).

66. *See* National Forensic Science Technology Center, *Forensic DNA Education for Law Enforcement Decision Makers: Partial Matches, State DNA Index System (SDIS)*, NAT’L FORENSIC SCI. TECH. CTR., <http://bit.ly/38nUm4Q> (last visited Dec. 20, 2019). State DNA databases contain forensic profiles from all local laboratories in the state, plus forensic profiles analyzed from the state laboratory itself. *See id.* Depending on the state’s DNA database laws, SDIS may also contain DNA profiles of convicted offenders and arrestees. *See id.*

67. A profile “approved” for entry into NDIS must meet the standards of the DNA Identification Act of 1994. 34 U.S.C. § 12592 (2017). For example, samples must be

the DNA profiles law enforcement can upload to samples collected from convicted offenders and arrestees.⁶⁸ Once a sample is in a DNA database, law enforcement presumptively retains the sample indefinitely, with seemingly no Fourth Amendment issues.⁶⁹ What's more, Fourth Amendment jurisprudence regarding voluntary DNA collection does not distinguish between samples collected from adults and juveniles, allowing law enforcement to indefinitely retain samples regardless of the suspect's age at the time of collection.⁷⁰

B. Fourth Amendment Implications of "Abandoned" DNA Collection

The manner in which some police officers interact with suspects to collect abandoned DNA raises serious Fourth Amendment privacy issues.⁷¹ The Fourth Amendment protects the rights of citizens "to be secure in their persons, houses, papers, and effects against unreasonable searches and seizures."⁷² Despite protection from unreasonable searches and seizures, the Fourth Amendment fails to define the bounds of a reasonable search or seizure.⁷³

prepared by "laboratories that have been accredited by a nonprofit professional association of persons actively involved in forensic science that is nationally recognized by the forensic science community." *Id.*

68. See Stephen Mercer & Jessica Gabel, *Shadow Dwellers: The Underregulated World of State and Local DNA Databases*, 69 N.Y.U. ANN. SURV. AM. L. 639, 653 (2014). A few states regulate the categories of DNA profiles stored at the state and local levels, but the vast majority of states do not. *See id.* at 655. For example, Pennsylvania's state statute governing the authority of law enforcement officers states that "nothing in this chapter shall limit or abrogate any existing authority of law enforcement officers to take, maintain, store, and utilize DNA samples for law enforcement purposes." 44 PA. CONST. STAT. § 2336 (2005).

69. See David H. Kaye, *Why So Contrived? Fourth Amendment Balancing, Per Se Rules, and DNA Databases After Maryland v. King*, 104 J. CRIM. L. & CRIMINOLOGY 535, 591 (2014). Kaye challenges the idea that retaining DNA samples after a crime is solved poses no Fourth Amendment risks. *See id.* at 592. Kaye examines the majority's holding in *Maryland v. King*, finding that the "presumption of regularity" in state DNA-database statutes should suggest that an individual's sensitive genetic information will be protected. *Id.* However, Kaye does address the possibility that database operators will not protect the information adequately. *See id.*

70. See Kevin Lapp, *As Though They Were Not Children: DNA Collection from Juveniles*, 89 TUL. L. REV. 435, 476 (2014). Lapp refutes the argument that DNA profiles collected from juveniles do not violate the Fourth Amendment, citing the available expungement mechanisms that place the burden of initiating and completing the process on juveniles. *See id.* at 444. Such mechanisms are almost never utilized, so to collect and retain juvenile DNA indefinitely constitutes an unreasonable search and seizure. *See id.* at 445.

71. *See id.* at 465.

72. U.S. CONST. amend. IV.

73. *See id.*; see also Tracey Malin, *The Central Meaning of the Fourth Amendment*, 35 WM. & MARY L. REV. 197, 207 (1993).

1. Unreasonable Searches and Seizures: From Trespass to *Katz*

Until the late 1960s, trespass analysis⁷⁴ governed Fourth Amendment jurisprudence and courts' determination of whether a search had occurred.⁷⁵ While courts still analyze traditional notions of trespass in certain contexts today,⁷⁶ the Supreme Court's decision in *Katz v. United States*⁷⁷ moved away from an interpretation of the Fourth Amendment that solely protected individuals from unreasonable searches and seizures inside the physical boundaries of their property.⁷⁸

In *Katz*, the Supreme Court held that the government's electronic surveillance of *Katz*'s private conversations in a telephone booth constituted a "search" for Fourth Amendment purposes.⁷⁹ Previously, the Court had only considered whether the government had intruded on the physical boundaries of a place to determine whether a search occurred.⁸⁰ *Katz* focused on the level of the government's intrusion upon a person.⁸¹ The Court reasoned that the intent of the Fourth Amendment was to "protect people, not places."⁸² Acknowledging that the trespass doctrine no longer exclusively controlled the Fourth Amendment analysis and that a Fourth Amendment violation could still occur without a physical intrusion, the Court developed a two-part framework to test for the existence of a search.⁸³

First, the *Katz* inquiry requires courts to assess whether an individual possessed an actual subjective expectation of privacy in the place or thing officers searched.⁸⁴ Second, the court conducts an

74. See *Olmstead v. United States*, 277 U.S. 438, 464 (1928) (describing an unreasonable search and seizure as "actual entrance into the private quarters of the defendant and the taking away of something tangible").

75. See generally *United States v. Jones*, 565 U.S. 400, 405 (2012). Following the adoption of the Fourth Amendment, the government's physical intrusion onto private property for the purpose of obtaining information was the conduct contemplated when protecting against unreasonable searches. See *id.* Only with the advent of technology did courts begin to consider non-physical intrusions "searches" as well. *Id.* at 430. *Jones* involved a tracking device placed on a car, and the Court held that the vehicle was a personal "effect" under the Fourth Amendment. *Id.* at 404.

76. See *id.* at 411.

77. See *Katz v. United States*, 389 U.S. 347 (1967).

78. See *id.* at 353.

79. See *id.*

80. See *id.* at 351; see also *Olmstead*, 277 U.S. at 464. *Olmstead* held that a wiretap of telephone conversations did not violate the Fourth Amendment's prohibition against unreasonable search and seizure because no search or seizure occurred. See *id.* As the Court explained, "the evidence was secured by the use of the sense of hearing and that only. There was no entry of the houses or offices of the defendants." *Id.*

81. See *Katz*, 389 U.S. at 351.

82. *Id.*

83. See *id.* at 361 (Harlan, J., concurring).

84. See *id.* Justice Harlan discusses the subjective prong as it relates to the object in which *Katz*'s privacy was first invaded, a telephone booth. See *id.* As Justice Harlan

objective test, examining whether the expectation of privacy is “one that society is prepared to recognize as reasonable.”⁸⁵ The *Katz* test has become the method of determining whether an incident violating an individual’s privacy rises to the level of an unreasonable search.⁸⁶

2. The Warrant Requirement and Its Exceptions

The Fourth Amendment generally requires law enforcement officers to obtain a warrant before conducting a search.⁸⁷ The specific needs of law enforcement, however, may dictate an exception to the warrant requirement.⁸⁸ Unless an exception to the warrant requirement applies, a warrantless search is presumptively unconstitutional.⁸⁹ Nevertheless, numerous exceptions to the warrant requirement allow law enforcement to conduct a warrantless search.⁹⁰ The exceptions relevant to this Comment include exigent circumstances and consent.⁹¹

a. Exigent Circumstances

Police may search without a warrant when the circumstances make it reasonable to dispense with the warrant requirement—circumstances known as “exigent circumstances.”⁹² When the “exigencies” of a situation make the needs of law enforcement sufficiently compelling, a

explains, someone who enters a telephone booth, closes the door, and pays to make a call does not believe that his call will be intercepted. *See id.* Such a belief is central to the reasonableness of a search. *See id.*

85. *See id.* Justice Harlan’s concurrence defines the objective reasonableness of the privacy expectation in a discussion of one of the most sacred places to a person, his home. *See id.* at 360. Justice Harlan explains, “[a] man’s home is, for most purposes, a place where he expects privacy, but objects, activities, or statements that he exposes to the ‘plain view’ of outsiders are not ‘protected’ because no intention to keep them to himself has been exhibited.” *Id.* Thus, the expectation of privacy one has in his home is objectively reasonable. *See id.*

86. *See* Peter Winn, *Katz and the Origins of the “Reasonable Expectation of Privacy” Test*, 40 MCGEORGE L. REV. 1, 1 (2009) (“In short, *Katz v. United States* represents a great touchstone of the law of privacy. . .”).

87. *See Katz v. United States*, 389 U.S. 347, 362 (1967).

88. *See id.*

89. The Supreme Court has expressed the view that any reasonable officer should know a warrantless search is presumptively unconstitutional. *See Groh v. Ramirez*, 540 U.S. 551, 559 (2004) (citing *Payton v. New York*, 445 U.S. 573, 586 (1980)).

90. *See* 68 AM. JUR. 2D *Searches and Seizures* § 114 (2019).

91. *See id.* Other warrant exceptions frequently invoked include searches incident to a valid arrest, inventory searches, plain-view searches, and *Terry* investigatory stops. *See id.* For a more thorough discussion of *Terry* investigatory stops, see generally *Terry v. Ohio*, 392 U.S. 1 (1968). A *Terry* stop occurs when police stop a person and detain him briefly to question him, on suspicion that he may be involved in criminal activity. *See id.* at 10.

92. *See Kentucky v. King*, 563 U.S. 452, 454 (2011).

warrantless search may be objectively reasonable under the Fourth Amendment.⁹³

In some cases, law enforcement officers invoke the exigent circumstances exception to obtain DNA samples without securing a warrant.⁹⁴ The justifications for the exigent circumstances exception, however, often do not apply to collecting DNA.⁹⁵ Unlike in drunk driving cases, where the concern is that evidence will dissipate rapidly, the identifying information in abandoned DNA samples will not dissipate over time.⁹⁶ When the police use a special justification to deviate from the warrant requirement, officers must limit their use of the evidence seized to uses that promote that specific special justification.⁹⁷ Collecting DNA in a situation involving exigent circumstances would not justify collecting abandoned DNA in a situation without the same immediately pressing needs and lack of time to secure a warrant.⁹⁸

b. Consent

The “consent” exception to the warrant requirement generally refers to expressed verbal or written consent.⁹⁹ In addition to express consent, every state in the United States has passed “implied consent” laws, which, for example, presume a driver on a public highway has consented to testing of his or her breath or blood for the presence of alcohol.¹⁰⁰ Although law enforcement normally uses implied consent laws to

93. See *id.* (citing *Mincey v. Arizona*, 437 U.S. 385, 394 (1978)).

94. See MING W. CHIN ET AL., *supra* note 53. Law enforcement may use the exigent circumstances exception to justify a warrantless collection of probative evidence that would be washed or wiped away if not collected immediately; such as a rape victim’s DNA. See *id.*

95. See Edward J. Imwinkelried & D.H. Kaye, *DNA Typing: Emerging or Neglected Issues*, 76 WASH. L. REV. 413, 419 n. 25 (2001).

96. See *id.*; see also *Birchfield v. North Dakota*, 136 S. Ct. 2160, 2198 (2016) (Thomas, J., concurring in part and dissenting in part); *Schmerber v. California*, 384 U.S. 757, 770 (1966) (holding that an officer facing exigent circumstances may obtain a biological sample without first securing a warrant).

97. See Imwinkelried & Kaye, *supra* note 95, at n.27.

98. See *supra* notes 95–97 and accompanying text.

99. See, e.g., 9 Wis. Prac., Criminal Practice and Procedure, *Consent to Search* § 19:82 (2d ed.) (2019).

100. See generally *Mitchell v. Wisconsin*, 139 S. Ct. 2525 (2019). In dissent, Justice Sotomayor wrote, “The state statute, however phrased, cannot itself create the actual and informed consent that the Fourth Amendment requires.” See *id.* at 2545. Justice Sotomayor also cited *Georgia v. Randolph*’s requirement that the voluntary consent exception be “jealously and carefully drawn.” See *Georgia v. Randolph*, 547 U.S. 103, 109 (2006). A state statute, according to the dissenters in *Mitchell*, is not narrow enough in scope and focus, and the state’s purposes would be better served by obtaining expressed consent. See *Mitchell*, 139 S. Ct. at 2545. But see *State v. Prado*, 947 N.W.2d 182, 204 (Wis. Ct. App. 2020) (holding that unconscious driver provision of implied consent statute is unconstitutional because the consent presumed does not satisfy any exception to the warrant requirement).

enforce blood alcohol concentration limits in DUI cases, police officers often rely upon a suspect's implied consent to collect abandoned DNA samples.¹⁰¹ Courts have found that a warrantless search of abandoned property is permissible because a person has no reasonable expectation of privacy in the property.¹⁰² However, in the context of criminal investigations, one reason that officers may obtain DNA samples without a warrant is their ability to obtain express consent.¹⁰³

If an individual agrees to a search, then the officer may conduct the search without first securing a warrant.¹⁰⁴ To give consent, the individual must knowingly, intelligently, and voluntarily agree to the search.¹⁰⁵ Whether consent is knowing, intelligent, and voluntary is a question of fact, to be determined from the totality of the objective circumstances.¹⁰⁶ Thus, courts determining whether an individual's consent to a DNA sample is valid must examine the factors surrounding the collection. Factors to be considered include (1) the situation at hand; (2) particular characteristics of the suspect; (3) the length of a detention; and (4) the impact of physical punishment, such as the deprivation of food or sleep.¹⁰⁷

C. *Collection of Abandoned DNA and Its Fourth Amendment Implications*

Abandoned DNA is a valuable crime-solving tool, but courts do not always treat it as such.¹⁰⁸ The Supreme Court has not yet considered whether abandoned DNA collection is a search for Fourth Amendment purposes. Several lower courts, however, have held that the collection

101. *See, e.g.*, *People v. Thomas*, 200 Cal. App. 4th 338, 344 (2011); *see also Williamson v. State*, 993 A.2d 626, 638 (2010) (holding that implied consent statute did not limit purposes for which police could collect saliva from breath test device, and that collection of DNA from device was constitutional).

102. *See People v. Gallego*, 190 Cal. App. 4th 388, 395 (Cal. Ct. App. 2010) (citing *People v. Parson*, 187 P.3d 1, 11 (Cal. 2008)). In concluding that DNA testing of Gallego's cigarette butt thrown onto the sidewalk was not a Fourth Amendment search, the court rejected Gallego's argument that "abandonment" required a volitional component that the involuntary shedding of genetic material lacks. *See id.* at 396. Gallego voluntarily discarded a cigarette butt onto a public sidewalk, which differs from the truly non-volitional act of unconsciously shedding cells. *See id.* at 396-97.

103. *See, e.g.*, *Varriale v. State*, 96 A.3d 793, 797 (Md. App. 2014) (holding that the state's retention and subsequent analysis of DNA that it had lawfully obtained by the defendant's consent was not a search).

104. *See Davis v. United States*, 328 U.S. 582, 593 (1946).

105. *See Schneckloth v. Bustamonte*, 412 U.S. 218, 223 (1973).

106. *See id.* at 223.

107. *See id.*

108. *See discussion infra* Section II.C.2.

and analysis of abandoned DNA does not constitute a search.¹⁰⁹ Lower courts liken abandoned DNA to trash, applying the *Katz* test to conclude that an individual does not have an objectively reasonable expectation of privacy in an item the individual does not intend to keep.¹¹⁰ This comparison stems from the Supreme Court's decision in *California v. Greenwood*.¹¹¹

1. *Greenwood*

In *Greenwood*, police suspected Billy Greenwood of trafficking drugs.¹¹² An officer asked the neighborhood trash collector to pick up garbage bags that Greenwood had left on the curb in front of his home and turn them over to police.¹¹³ After searching the trash bags, police found items indicative of narcotics use and secured a search warrant for Greenwood's home.¹¹⁴ In resolving the question of whether to uphold drug possession charges against Greenwood, the Supreme Court applied the *Katz* test, holding that Greenwood had no reasonable expectation of privacy in his trash because he knowingly left it on the curb for the express purpose of conveying it to a third party.¹¹⁵

The Court further reasoned that trash is accessible to all members of the public once an individual has abandoned it on the curb.¹¹⁶ Placing trash on the curb for a third party to collect necessarily assumes that a third party will take possession of it, requiring the original owner to relinquish their privacy rights in it.¹¹⁷ The Court also reasoned that once the trash was in the collector's possession, the collector was then free to sort through the abandoned items, or allow others, such as the police, to do so.¹¹⁸ Thus, Greenwood's act of placing his trash on the curb for the trash collector eliminated his objectively reasonable expectation of privacy in his trash.¹¹⁹

The dissenters in *Greenwood* took the opposite position, arguing that the search of Greenwood's trash violated the Fourth Amendment.¹²⁰

109. See, e.g., *Schmidt v. Stassi*, 250 F. Supp. 3d 99, 105 (E.D. La. 2017); *Raynor v. State*, 99 A.3d 753, 768 (Md. 2014); *Comm. v. Arzola*, 26 N.E. 3d 185, 191 (Mass. 2015).

110. See, e.g., *Williamson v. State*, 993 A.2d 626, 632 (Md. 2010), discussed *infra* Section II.C.2.b.

111. See *California v. Greenwood*, 486 U.S. 35, 41 (1988).

112. See *id.* at 37.

113. See *id.*

114. See *id.* at 38.

115. See *id.* at 39.

116. See *id.* at 40.

117. See *id.* at 41.

118. See *id.* at 40.

119. See *id.* at 42.

120. See *California v. Greenwood*, 486 U.S. 35, 54 (1988) (Brennan, J., dissenting).

In the dissenters' view, trash bags are commonly associated with an individual's personal affects and carry an objectively reasonable expectation of privacy.¹²¹ The expectation of privacy stems from the idea that a search of trash enables one to draw conclusions about an individual's personal life, as it "testifies eloquently to the eating, reading, and recreational habits of the person who produced it."¹²²

The dissent likened the possibility of police searching through trash to the possibility that a burglar may break into a home, reasoning that the possibility of a privacy invasion does not negate the individual's expectation of privacy.¹²³ The *Greenwood* dissenters took the view that the Court should recognize a limited expectation of privacy in trash,¹²⁴ because trash can reveal intimate information about a person.¹²⁵

2. Cases Likening Abandoned DNA to Trash

Lower courts have followed the *Greenwood* majority's logic and held that the collection of abandoned DNA is not a search because the individual who abandoned the DNA does not retain a reasonable expectation of privacy in a discarded object.¹²⁶ Lower courts follow the reasoning that, upon discarding an object, an individual "knowingly exposes" it to public view, so it falls outside the confines of the Fourth Amendment.¹²⁷

a. *Bly, Raynor*, and the Public-Building Analysis

In addition to treating abandoned DNA equally to trash, courts have found that individuals relinquish their reasonable expectation of privacy in public buildings or interrogation rooms.¹²⁸

For example, the court in *Commonwealth v. Bly* held that Bly, the suspect, did not have a reasonable expectation of privacy in a cigarette butt and water bottle that the police offered him because he left both behind in an interrogation room.¹²⁹ Law enforcement subsequently

121. *See id.* at 50 ("Scrutiny of another's trash is contrary to commonly accepted notions of civilized behavior. I suspect, therefore, that members of our society will be shocked to learn that the Court, the ultimate guarantor of liberty, deems unreasonable our expectation that the aspects of our private lives that are concealed safely in a trash bag will not become public.").

122. *Id.* at 50.

123. *See id.* at 54.

124. *See* Madeline A. Herdrich, *California v. Greenwood: The Trashing of Privacy*, 38 AM. U. L. REV. 993, 1019 (1990).

125. *See* *California v. Greenwood*, 486 U.S. 35, 50 (Brennan, J., dissenting).

126. *See id.* at 40.

127. *See* Joh, *supra* note 57, at 863.

128. *See, e.g.,* *Raynor v. State*, 99 A.3d 753, 757 (Md. 2014).

129. *See* *Commonwealth v. Bly*, 862 N.E.2d 341, 357 (Mass. 2007).

collected and analyzed DNA from the items.¹³⁰ The court reasoned that Bly had discarded his expectation of privacy in the cigarette butt and water bottle because Bly did not attempt to take the items with him when traveling within the building.¹³¹

The court concluded that no search or seizure occurred, despite Bly's argument that he left the items behind due to institutional rules and not of his own volition.¹³² Because the court found no Fourth Amendment violation, the court declined to suppress the DNA evidence, as Bly had never possessed an expectation of privacy in the items and, thus, could not have had an expectation of privacy in the DNA left behind.¹³³

Similarly, in *Raynor v. State*, the Court of Appeals of Maryland held that analyzing genetic material seized from the armrests of a chair did not violate the Fourth Amendment.¹³⁴ In *Raynor*, a rape victim contacted the police and explained that she suspected Raynor had raped her two years prior.¹³⁵ Raynor agreed to come to the police station for an interview, but refused to consent to providing a DNA sample.¹³⁶ The police allowed Raynor to leave at the conclusion of the interview.¹³⁷ An officer noticed that Raynor rubbed his bare arms on the armrest of the chair during the interview.¹³⁸ Despite Raynor's explicit non-consent to providing a DNA sample, the officer took Raynor's DNA from the armrest.¹³⁹ The police found that the DNA sample collected from the armrest matched the DNA sample from the crime scene, and subsequently charged Raynor with the rape.¹⁴⁰

The court held that the Fourth Amendment allowed testing of the DNA left behind on the armrests of the chair, because Raynor never possessed an expectation of privacy in his genetic material.¹⁴¹ Moreover, because Raynor was in the police station, a public building, the court presumed Raynor "exposed" the physical characteristics of his DNA to the public.¹⁴² Therefore, the court held that Raynor had no reasonable

130. *See id.*

131. *See id.* at 351.

132. *See id.* at 356.

133. *See id.* at 357.

134. *See Raynor v. State*, 99 A.3d 753, 757 (Md. 2014).

135. *See id.* at 754.

136. *See id.*

137. *See id.*

138. *See id.*

139. *See id.*

140. *See id.* at 755.

141. *See id.* at 761, 765.

142. *See id.* at 757 ("The suppression court denied the motion, reasoning in pertinent part: . . . 'This is a very simple matter as I see it. Does he have a reasonable expectation of privacy that society is prepared to recognize of what's left [on] a chair

expectation of privacy in his DNA, noting that he left the room without attempting to remove his genetic material from the chair.¹⁴³

b. *Williamson v. State*

In *Williamson v. State*, the Court of Appeals of Maryland found that Williamson did not have a reasonable expectation of privacy in a cup and wrapper he had discarded on the floor of a police holding room.¹⁴⁴ In that case, law enforcement matched Williamson's DNA from his discarded cup to DNA found in forensic medical examinations of two separate rape victims.¹⁴⁵ The police collected Williamson's DNA from the cup pursuant to Maryland's DNA Collection Act,¹⁴⁶ and the state later charged Williamson with rape and related offenses.¹⁴⁷ Williamson's attorneys moved to suppress the introduction of the DNA into evidence.¹⁴⁸

The trial judge denied the motion to suppress, and the Court of Appeals of Maryland upheld the decision.¹⁴⁹ In deciding that the police obtained the DNA evidence legally, the court emphasized that Williamson did not have a reasonable expectation of privacy in the items at all since he had no property interest in the holding room where the police seized the items.¹⁵⁰ Even if he had possessed a property interest in the holding room, Williamson did not have a reasonable expectation of privacy in the cup and wrapper because he "quite clearly" left the trash behind "because he was done with it."¹⁵¹

Williamson argued, that although the court could find that the seizure of the cup was lawful, the testing of the DNA was a separate search that the Fourth Amendment did not permit.¹⁵² The court concluded that the collection of DNA from the cup was not a "search" because the officers did not compel Williamson to turn over his DNA.¹⁵³ The expectation of privacy, the court concluded, rests with the item left

when he gets up and leaves? The answer to that as far as I am concerned is no, he has no such expectation of privacy. He is in a public building. . . ." (alteration in original)).

143. *See id.*

144. *See Williamson v. State*, 993 A.2d 626, 632 (Md. 2010).

145. *See id.* at 628.

146. *See MD. PUB. SAFETY* § 2-504 (2009) (stating that police may collect a DNA sample "at the time the individual is charged at a facility specified by the Secretary [of State Police]"). *MD. PUB. SAFETY* § 2-504. A holding room such as the one in which police confined Williamson would qualify as an appropriate facility for DNA collection from an individual who has been charged with a crime under the Act. *See id.*

147. *See Williamson*, 993 A.2d at 629.

148. *See id.*

149. *See id.*

150. *See id.* at 632.

151. *Id.*

152. *See id.* at 637.

153. *See id.*

behind, not the genetic material the item contains.¹⁵⁴ As a result, Williamson had relinquished any expectation of privacy in the cup and the DNA on the cup when he left the cup on the floor of the holding room.¹⁵⁵

As seen in *Williamson*, criminal suspects in holding rooms face an expansive body of legal doctrine that operates to summarily find waiver of the expectation of privacy in DNA material.¹⁵⁶ Curiously enough, that legal doctrine does not differ between adults and juveniles for purposes of determining capacity to relinquish that expectation of privacy.

D. Juvenile Capacity to Relinquish Constitutional Rights

The criminal justice system is supposed to treat juveniles differently from adults.¹⁵⁷ Notably, juveniles who commit crimes appear before a separate juvenile justice system.¹⁵⁸ The juvenile justice system's objective is not to punish offenders, but rather to rehabilitate them.¹⁵⁹ *Roper v. Simmons*, the case in which the Supreme Court decided that capital punishment for crimes committed under the age of 18 was unconstitutional, noted three general differences between juveniles¹⁶⁰ and adults: (1) a greater propensity for "immaturity and irresponsibility";¹⁶¹ (2) increased vulnerability and susceptibility to negative influences, including peer pressure; and (3) more transitory, less fixed personality traits.¹⁶² Thus, applying the same criminal code to juveniles and adults would lead to unjust outcomes for juveniles.¹⁶³ Unfortunately, in practice, courts merely mention, but do not fully appreciate, the differences between juveniles and adults.¹⁶⁴

For example, in *J.D.B. v. North Carolina*,¹⁶⁵ the Supreme Court mentioned a child's age as one factor among many when assessing

154. *See id.* at 640.

155. *See id.* at 636.

156. *See* discussion *supra* Section II.C.2.

157. *See* Linda B.M. Uttal & David H. Uttal, *Children Are Not Little Adults: Developmental Differences and the Juvenile Justice System*, 15 PUB. INT. L. REP. 234, 235 (2010).

158. *See id.*

159. *See* Gammons v. Berlat, 696 P.2d 700, 703 (Ariz. 1985) ("[A] delinquency adjudication does not result in the imposition of criminal sanctions; rather the purpose of a delinquency proceeding is rehabilitative.").

160. A "juvenile" is an individual under the age of 18. *See* 18 U.S.C. § 5031 (1994).

161. Juveniles are generally more immature and irresponsible than adults, which results in increased reckless behavior in "virtually every [crime] category." *See Roper v. Simmons*, 543 U.S. 551, 560 (2005).

162. *See id.* at 569–70; *see also* Terry Maroney, *The False Promise of Adolescent Brain Science in Juvenile Justice*, 85 NOTRE DAME L. REV. 89, 107 (2009).

163. *See In re Gault*, 387 U.S. 1, 30 (1967).

164. *See J.D.B. v. North Carolina*, 564 U.S. 261, 267 (2011).

165. *See id.*

whether the juvenile defendant was aware that he was in custody.¹⁶⁶ The Court did not go as far as holding that a child's age would be a determinative, or even significant, factor in every case.¹⁶⁷ Rather, the Court simply acknowledged a child's age as "a reality that courts cannot simply ignore."¹⁶⁸

The Supreme Court's holding in *J.D.B.* suggests that courts and police departments must take a child's age into consideration when making consent determinations.¹⁶⁹ To understand why a suspect's age is so important, one must consider the physiological and resulting psychological differences between juveniles and adults.¹⁷⁰

1. Scott and Steinberg's Model: Differences Between Juveniles and Adults

Juveniles are psychologically and neurologically different from adults in ways that inform their capacity to understand and relinquish their constitutional rights against unreasonable searches and seizures.¹⁷¹ Elizabeth S. Scott and Laurence Steinberg, leading scholars of developmental psychology and neuroscience pertaining to juvenile justice,¹⁷² articulate these differences in their book *Rethinking Juvenile Justice*.¹⁷³ Scott and Steinberg cite four important neurological differences between the adolescent brain and the adult brain that lead to different reactions to similar stimuli.¹⁷⁴ These differences include: (1) structural immaturity in the adolescent brain, particularly the frontal lobes, which limits the ability to imagine the future; (2) changes in the brain's reward circuitry occurring at puberty which predispose

166. *See id.* at 267. *J.D.B.* involved a child who was suspected of a home break-in and questioned about it. *See id.* at 265. A uniformed police officer removed the child from his school classroom, escorted him to a closed-door conference room, and questioned him for at least half an hour. *See id.* at 266. The police did not give the child *Miranda* warnings or the opportunity to speak with his guardian. *See id.* Eventually, he asked if he would "still be in trouble" if he returned the "stuff," but only confessed to the break-ins after he learned about the possibility of juvenile detention. *See id.* at 267. The Court found that the interrogation and *J.D.B.*'s consent were lawful, because the voluntariness test "independently accounts for a child's youth." *Id.* at 280. Neither the court in *J.D.B.* nor the prior decisions it cites articulate exactly how the test accounts for age, as age is simply mentioned as "a factor." *See id.* at 277; *see also* *Gallegos v. Colorado*, 370 U.S. 49, 54 (1962); *see also* *Haley v. State of Ohio*, 332 U.S. 596, 599 (1948) (internal citations omitted).

167. *See J.D.B.*, 564 U.S. at 277.

168. *See id.*

169. *See supra* notes 166–168 and accompanying text.

170. *See discussion infra* Section II.D.1.

171. *See* Maroney, *supra* note 162, at 96–97.

172. *See* ELIZABETH S. SCOTT & LAURENCE STEINBERG, *RETHINKING JUVENILE JUSTICE* 29 (2008).

173. *See id.*

174. *See id.* at 29.

adolescents to value rewards of behavior more than they appreciate the risks; (3) changes in social and emotional processing, which lead to poor impulse control and emotional regulation; and (4) the gap between cognitive and emotional maturity resulting from delayed maturation of brain regions responsible for executive function.¹⁷⁵

a. Structural Immaturity of the Adolescent Brain

At the time of birth, development of the human brain is far from complete.¹⁷⁶ Brain maturation continues into adulthood, but the most significant changes occur during the period between childhood and adolescence.¹⁷⁷ According to Scott and Steinberg, brain maturation during adolescence typically occurs through one of two processes: “synaptic pruning” and “myelination.”¹⁷⁸ Both of these processes make the brain’s information processing more efficient.¹⁷⁹ Synaptic pruning selectively eliminates unused connections between neurons¹⁸⁰ in the brain.¹⁸¹ Synaptic pruning makes information processing more efficient by decreasing the number of connections between neurons and strengthening the remaining connections.¹⁸² Myelination is the development of myelin, the white fatty substance forming insulation around the neural circuits in the brain.¹⁸³ Scott and Steinberg liken myelin to insulation on wires, facilitating smoother processing of electrical impulses through the brain.¹⁸⁴ Smoother processing allows the

175. *See id.* at 34. For a more thorough discussion of executive function, see discussion *infra* Section II.D.1.d.

176. *See* Linda Patia Spear, *Adolescent Neurodevelopment*, 52 J. ADOLESCENT HEALTH S7, S7 (2012).

177. *See id.*; *see also* SCOTT & STEINBERG, *supra* note 172, at 15. “Developmental psychologists view adolescence as a critical stage in an individual’s development, not only because it is a period in which decision-making capacities mature, but also because during adolescence individuals begin to learn many essential skills required for optimal functioning in adulthood.” *Id.* The World Health Organization defines adolescents as individuals between 10 and 19 years of age. *See Adolescent Health*, WORLD HEALTH ORG., <https://bit.ly/3cu6689> (last visited April 15, 2021).

178. *See* SCOTT & STEINBERG, *supra* note 172, at 44.

179. *See id.* at 45.

180. Neurons are the fundamental building blocks of the brain and of the central nervous system. *See What Is a Neuron?*, QUEENSLAND BRAIN INST., <http://bit.ly/31Xf0Ev> (last visited Feb. 14, 2020). Neurons are the cells that receive sensory input from the outside world, send motor commands to muscles, and relay electrical impulses through the brain. *See id.*

181. *See* SCOTT & STEINBERG, *supra* note 172, at 44.

182. *See id.* at 45.

183. *See id.* at 44.

184. *See id.* at 45.

brain regions involved in cognitive functions to communicate with one another.¹⁸⁵

Synaptic pruning and myelination during adolescence cause substantial changes in adolescents' decision-making capabilities.¹⁸⁶ Scientists view brain development not as a chronological process, but a series of dynamic changes "by which separate networks of functionally related regions become more strongly linked over time."¹⁸⁷ As these regions become linked, the brain becomes more mature.¹⁸⁸ The adolescent brain lacks the necessary structure for future orientation¹⁸⁹ that the adult brain has already acquired, because the necessary networks have not yet become linked.¹⁹⁰ Additionally, due to their chronological age, adolescents have had fewer opportunities to refine future orientation than adults.¹⁹¹

To illustrate adolescent difficulties with future orientation, Scott and Steinberg discuss a study known as the Tower of London experiment.¹⁹² The experiment requires subjects to think ahead and anticipate future situations to solve problems.¹⁹³ The study found that when a problem could be solved in two or three moves, adolescents performed similarly to adults.¹⁹⁴ However, when the problems increased in difficulty and required more moves to solve, adolescents did not plan ahead as much as adults did, spending the same amount of time as they had spent on the easy problems, which led to poor performance.¹⁹⁵ Scott and Steinberg note that the study's findings are consistent with casual observations of adolescents in the real world, which suggest that adolescents are less likely than adults to think ahead before acting.¹⁹⁶

b. Reward Circuitry

Juveniles take more risks than adults not because they are less knowledgeable about the risks of behaviors, but because they attach greater value to the rewards that risk-taking provides.¹⁹⁷ Despite juvenile

185. See Tomáš Paus et al., *Structural Maturation of Neural Pathways in Children and Adolescents: In Vivo Study*, 5409 SCIENCE 1908, 1911 (1999).

186. See SCOTT & STEINBERG, *supra* note 172, at 45.

187. See Spear, *supra* note 176, at S8.

188. See *id.*

189. "Future orientation" refers to the capacity and inclination to project events into the future. See SCOTT & STEINBERG, *supra* note 172, at 39.

190. See *id.* at 39.

191. See *id.*

192. See *id.* at 46.

193. See *id.* at 46.

194. See *id.*

195. See *id.*

196. See *id.*

197. See *id.* at 42.

deficiencies in future orientation, adolescents and adults estimate the risks of behavior similarly.¹⁹⁸ However, it is the calculation of potential rewards that distinguishes juveniles.¹⁹⁹ When calculating the “risk-reward ratio,”²⁰⁰ juveniles will weigh the risks of behavior similarly to adults, but weigh the potential rewards more heavily.²⁰¹ Scott and Steinberg refer to this quality as “the salience of rewards.”²⁰² Scientific evidence suggests that salience of rewards is at least partially driven by neurobiological changes in the brain’s reward circuitry that take place at puberty.²⁰³

c. Emotional Processing and Impulse Control

In addition to synaptic pruning and myelination, the brain undergoes changes to mechanisms for processing social and emotional information during adolescence.²⁰⁴ Chemicals produced in the brain during puberty²⁰⁵ alter the emotional processing of social stimuli, causing stronger emotional reactions in adolescents.²⁰⁶ The proliferation of chemicals results from changes to the limbic system, several different interconnected structures in the brain controlling responses to emotional stimuli.²⁰⁷ The emotional changes are most dramatic around the onset of puberty, leading to intense emotional reactions very early in adolescence.²⁰⁸ The neurobiological underpinnings of increased risk-taking in group situations, especially during the first half of the adolescent decade, originate from the limbic system’s development.²⁰⁹

198. See SCOTT & STEINBERG, *supra* note 172, at 42.

199. See *id.*

200. See *id.* (“Psychologists refer to the outcome of weighing risks and rewards in making decisions as the ‘risk-reward ratio’; the higher the ratio, the less likely the individual is to engage in the behavior in question.”).

201. See *id.*

202. See *id.*

203. See *id.* (“There is some support for the notion that developments in the limbic system of the brain and in connections between the limbic system and the prefrontal cortex around puberty may account for at least part of this change in reward-seeking.”).

204. See *id.* at 45.

205. For example, the brain begins to produce more dopamine, a neurotransmitter important for the experience of pleasure, and oxytocin, a neural hormone important for facilitating social bonding, at the onset of puberty. See *id.* at 48.

206. See Eric E. Nelson et al., *The Social Re-Orientation of Adolescence: A Neuroscience Perspective on the Process and Its Relation to Psychopathology*, 35 PSYCHOL. MED. 163, 168 (2005).

207. See Rand S. Swenson, REVIEW OF CLINICAL AND FUNCTIONAL NEUROSCIENCE (2006).

208. See SCOTT & STEINBERG, *supra* note 172, at 48.

209. See *id.* at 48.

For example, a study from the National Institute of Mental Health (NIMH)²¹⁰ demonstrated that adolescents and adults have differing reactions to fear.²¹¹ In the study, both adolescents and adults viewed photographs of faces displaying fearful expressions.²¹² Brain imaging revealed that adolescents viewing the photographs experienced greater activation in the amygdala, the brain region that plays a key role in processing emotions.²¹³

The NIMH's finding suggests that adolescents are more sensitive to the emotional qualities of social stimuli.²¹⁴ Adolescent brains undergo substantial changes in the systems associated with impulse control and regulation of emotions, due to the limited number of brain regions available to perform such tasks.²¹⁵ Because adults employ more brain regions when invoking impulse control, they are better at inhibiting an emotional response when compared to their juvenile counterparts.²¹⁶ Adolescents, employing a more limited number of brain regions, are more vulnerable to feeling overwhelmed and acting on impulse.²¹⁷ Thus, a police officer who asks a question of an adolescent suspect will likely receive a quick, underdeveloped response due to the youth's lack of impulse control.²¹⁸ Meanwhile, an adult in the same situation would employ more brain regions to give a more sophisticated response.²¹⁹

d. Executive Function

Finally, Scott and Steinberg address the deficiencies in executive functioning in the adolescent brain.²²⁰ Executive functions are advanced thinking processes employed in planning ahead, controlling impulses, and weighing the costs and benefits of decisions before acting.²²¹ The prefrontal cortex, the brain region central to executive functions, does not fully mature until an individual's early twenties.²²² The prefrontal cortex controls functions of planning, emotional regulation, impulse control,

210. The National Institute of Mental Health (NIMH) is the leading federal agency for research on mental health disorders. See National Institute of Mental Health, *Mental Health Information*, NAT'L INST. OF MENTAL HEALTH, <http://bit.ly/3qJsSwF> (last visited January 10, 2021).

211. See Nelson et al., *supra* note 206, at 168.

212. See *id.*

213. See *id.*

214. See *id.*

215. See SCOTT & STEINBERG, *supra* note 172, at 45.

216. See *id.* at 44.

217. See *id.* at 45.

218. See *id.*

219. See *id.*

220. See *id.* at 49.

221. See *id.* at 44.

222. See *id.*

and evaluation of risk and reward.²²³ Changes in the brain's limbic system, the region that processes emotional changes and social information, begin with the onset of puberty.²²⁴ These changes combine to make adolescence a time of inherently immature judgment.²²⁵

Meanwhile, the timing of the limbic system's development—early adolescence—stands in sharp contrast to changes in the prefrontal cortex, which do not begin until late adolescence and continue into adulthood.²²⁶ This gap in time leads to a gap in “regulatory competence,” the adolescent's ability to control his or her impulses and regulate emotions.²²⁷ Adolescents' executive functions are not mature, so their capacities for planning, anticipating future consequences, and impulse control are deficient when compared with those of adults.²²⁸ Scott and Steinberg refer to the situation as “starting the engines without a skilled driver.”²²⁹

Whether a suspect is an adult or a juvenile, DNA is a useful tool for law enforcement in solving crimes that would likely otherwise remain unsolved. Courts throughout the United States have found that collection of “abandoned” DNA from adult suspects is not a search for Fourth Amendment purposes, ensuring that DNA collection remains a tool at law enforcement's disposal.²³⁰ However, the courts have only considered the constitutionality of abandoned DNA collection for adult suspects.²³¹ While the courts have not yet taken up the question of whether collecting juveniles' “abandoned” DNA without consent is constitutional, Scott and Steinberg's research suggests that juvenile suspects lack the physical and emotional maturity to consent to abandoned DNA collection.²³²

III. ANALYSIS

Regardless of age, an individual cannot give consent unless that consent is knowing, intelligent, and voluntary,²³³ which requires “[a] full awareness of both the nature of the right being abandoned and the

223. *See id.*

224. *See id.*

225. *See* SCOTT & STEINBERG, *supra* note 172, at 48.

226. *See id.* at 44.

227. *See id.*

228. *See id.*

229. *Id.* at 49.

230. *See* discussion *supra* Section II.C.2.

231. *See* discussion *supra* Section II.C.2.

232. *See* discussion *supra* Section II.D.

233. *See* *Schneekloth v. Bustamonte*, 412 U.S. 218, 249 (1973).

consequences of the decision to abandon it.”²³⁴ Therefore, consent cannot be knowing, intelligent, and voluntary if the faculties controlling knowledge, intelligence, and voluntariness are not fully developed.²³⁵ Due to the heightened cognitive ability of adults, adults have the cognitive capacity to give knowing, intelligent, and voluntary consent that juveniles simply—biologically—do not yet have.²³⁶

The Supreme Court has considered age as one of several factors in determining “the totality of the circumstances” of whether an individual can give knowing, intelligent, and voluntary consent.²³⁷ The totality of the circumstances test, however, does not fully appreciate the critical differences between juveniles and adults.²³⁸ As the Supreme Court articulated, “so wide a gulf between the State’s treatment of the adult and of the child requires a bridge sturdier than mere verbiage, and reasons more persuasive than cliché can provide.”²³⁹ That bridge should take the form of a bright-line rule that presumes juveniles to be incapable of providing consent to law enforcement and incapable of allowing law enforcement to collect their abandoned DNA.²⁴⁰

A. *Juveniles’ Lack of Capacity to Consent to Abandoned DNA Collection*

For juveniles, the most important criterion of adulthood is not the achievement of arbitrary milestones, but rather an intangible, psychological feeling of self-sufficiency and autonomy.²⁴¹ The physical maturation of the adolescent brain plays a key role in achieving autonomy and adult decision-making capabilities.²⁴² The psychological deficiencies that contribute to immaturity in adolescent judgment are grounded in the underlying immaturity of the brain structures governing that judgment.²⁴³ These differences manifest in future orientation, salience of rewards, social and emotional processing resulting in diminished impulse control, and delayed development of executive function in adolescents.²⁴⁴

234. *Moran v. Burbine*, 475 U.S. 412, 421 (1986).

235. See discussion *infra* Section III.A.

236. See discussion *supra* Section II.D.

237. See *J.D.B. v. North Carolina*, 564 U.S. 261, 270 (2011).

238. See *id.* at 277 (“This is not to say that a child’s age will be a determinative, or even significant, factor in every case.”).

239. See *In re Gault*, 387 U.S. 1, 30 (1967).

240. While juveniles’ developing cognitive faculties should render them unable to provide all forms of consent, this Comment focuses only on consent to abandoned DNA collection.

241. See Lapp, *supra* note 39, at 358.

242. See SCOTT & STEINBERG, *supra* note 172, at 49.

243. See *id.*

244. See *id.*

Each of these differences should change the way the criminal justice system approaches collecting DNA evidence from adolescent suspects. Courts have briefly considered psychological differences when determining whether to expunge DNA records but have not explicitly discussed whether age should factor into the collection of DNA itself.²⁴⁵ The developmental differences between adolescents and adults should require courts to protect juvenile suspects when law enforcement attempts to collect abandoned DNA from them.

1. Juveniles Cannot Consent Due to Deficiencies in Future Orientation

More so than adults, juveniles discount the future because they fail to anticipate the future consequences of their present choices.²⁴⁶ A juvenile's failure to adequately orient his or her thinking towards the future makes consent to abandoned DNA collection difficult for a juvenile suspect.²⁴⁷ Consent cannot be knowing, intelligent, and voluntary if the suspect cannot fully appreciate the consequences of abandoning the right.²⁴⁸ The structural immaturity of juveniles' brains makes it impossible for juveniles to appreciate these consequences fully.²⁴⁹

As in J.D.B.'s case, a juvenile suspect might agree to comply with an officer's instructions so that the officer allows the juvenile to leave, even if compliance results in a negative outcome for the juvenile.²⁵⁰ A juvenile suspect also might have difficulty predicting the consequences of accepting a meal or a drink from the officer, thereby inadvertently providing a DNA sample.²⁵¹

245. See *Samy F. v. Fabrizio*, 103 N.Y.S.3d. 428, 436 (App. Div. 2019). *Samy F.* involved a decision whether to expunge petitioner's DNA profile from the database and designate him as a "youthful offender" whose DNA profile the court has the authority to expunge. *Id.* at 430. In deciding whether to expunge the profile, the court considered factors such as: (1) the extent of the juvenile's participation in the underlying crime; (2) circumstances surrounding consent to DNA sampling, including age; (3) claim of developmental delays; and (4) absence of a parent or other adult at the time of consent. *See id.* at 437. The court did not make mention of whether the petitioner's age factored into the collection of DNA upon arrest. *See id.*

246. See SCOTT & STEINBERG, *supra* note 172, at 39.

247. See discussion *supra* Section II.D.1.a.

248. See *Moran v. Burbine*, 475 U.S. 412, 421 (1986).

249. See discussion *supra* Section II.D.1.a.

250. See *J.D.B. v. North Carolina*, 564 U.S. 261, 267 (2011) ("J.D.B. confessed that he and a friend were responsible for the break-ins. DiCostanzo only then informed J.D.B. that he could refuse to answer the investigator's questions and that he was free to leave."). *Id.* Only allowing J.D.B. to refuse to answer questions or leave the premises after he admitted to the break-ins implies that the officer was willing to detain J.D.B. until the juvenile complied with the questioning. *See id.* at 268.

251. See *Ransom & Southall*, *supra* note 1.

Additionally, juveniles have difficulty anticipating the ultimate destination of a DNA sample.²⁵² A juvenile's inability to fully comprehend consequences makes for an unintelligent waiver.²⁵³ If juveniles knew what would ultimately happen to their DNA samples, they might not provide such samples or act in ways that allow the police to collect those samples.²⁵⁴ For example, in *People v. K.N.*, officers told 17-year-old K.N.²⁵⁵ that they would compare his DNA only to the gun recovered at the time of his arrest.²⁵⁶ Unbeknownst to K.N., the police uploaded K.N.'s DNA into New York City's local "suspect" DNA database, known as LDIS.²⁵⁷ Given K.N.'s structurally immature brain and resulting difficulty with future orientation, K.N. may not have considered the future consequences at all.²⁵⁸ Therefore, his consent should not have been considered fully knowing, intelligent, and voluntary.

Meanwhile, an adult is more likely to consider what could happen to a DNA sample.²⁵⁹ The adult suspect may refuse to provide a sample without an assurance that the police will destroy it after use.²⁶⁰ Indeed, Glenn Raynor²⁶¹ refused to provide a DNA sample during an interview with police because the officer did not provide assurance that the department would destroy the sample at the conclusion of their investigation.²⁶² Although the department still took a sample of Raynor's abandoned DNA,²⁶³ Raynor's initial refusal to provide the sample without an assurance that it would be destroyed demonstrates an ability to assess the future consequences of a present decision.²⁶⁴ While Raynor was judged capable of giving consent to the collection of his abandoned DNA because he was in a public building,²⁶⁵ courts should not continue to extend this logic to juvenile suspects. Juvenile suspects cannot predict

252. See discussion *infra* Section III.A.1.

253. See discussion *supra* Section II.D.1.a.

254. See discussion *supra* Section II.D.1.a.

255. K.N. was a 17-year-old suspect. See *People v. K.N.*, 87 N.Y.S. 3d 862, 866 (2019).

256. See *id.*

257. See *id.* at 867 ("The police did not tell [K.N.] that by 'consenting' to give his DNA, he was signing away his DNA profile to the City of New York for forensic comparisons from the time he was a teenager into perpetuity.").

258. See *id.* at 872 ("Adults, let alone terrified minors, are barely able to comprehend the grave consequences of surrendering their DNA to law enforcement.").

259. See discussion of synaptic pruning and myelination *supra* Section II.D.1.a.

260. See *Raynor v. State*, 99 A.3d 753, 756 (Md. 2014).

261. Glenn Raynor refers to the defendant in *Raynor v. State*. See discussion *supra* Section II.C.2.a.

262. See *Raynor*, 99 A.3d at 756.

263. See *id.*

264. See *id.*

265. See discussion *supra* Section II.C.2.a.

the future consequences of present actions in the same manner as adults and therefore cannot knowingly and intelligently consent.²⁶⁶

2. Juveniles Cannot Consent Due to Increased Salience of Rewards

In the mind of a juvenile, the reward for engaging in a risky behavior far outweighs the risks incurred when deciding to engage in such behavior.²⁶⁷ The danger of some types of risk-taking could constitute a reward to a juvenile, while the same behavior would seem risky to an adult.²⁶⁸ Much like the concerns associated with future orientation, the increased salience of rewards for juveniles makes it difficult for them to consent to abandoned DNA collection. Juveniles often choose a course of action based on the prospect of an immediate, attractive reward.²⁶⁹ The reward-focused frame of mind poses difficulties when evaluating the knowing and intelligent quality of consent.²⁷⁰ An individual whose brain has not yet matured past the instant-gratification stage of puberty will have a harder time meeting even the lenient “totality of the circumstances” requirement of consent.²⁷¹

A juvenile suspect will focus on the concrete, immediate reward of leaving the precinct or accepting food and water without weighing the long-term consequences and risks of these actions.²⁷² Such a distorted focus can interfere with the knowing, intelligent, and voluntary qualities

266. See discussion *supra* Section II.D.

267. See discussion *supra* Section II.D.1.b.

268. See Elizabeth S. Scott & Laurence Steinberg, *Less Guilty by Reason of Adolescence: Developmental Immaturity, Diminished Responsibility, and the Juvenile Death Penalty*, 12 AM. PSYCHOL. 1009, 1013 (2003). Scott and Steinberg cite driving well over the speed limit as a behavior that could present a different risk-reward calculus for juveniles and adults. See *id.* at 1012. To the juvenile, the reward of arriving at the destination sooner would outweigh the risk of being pulled over or involved in a crash. See *id.*

269. See SCOTT & STEINBERG, *supra* note 172, 47. In order to demonstrate the salience of immediate rewards to adolescents, Scott and Steinberg discuss an experiment known as the Iowa Gambling Task. See *id.* Subjects are given four decks of cards, face down, and instructed to turn over cards from any deck. See *id.* Two of the decks are “good” and two are “bad”. See *id.* A few cards in the “bad” decks, however, offer very high rewards. See *id.* As the task progresses, adults pick more frequently from the good decks, while adolescents are continually drawn to the bad decks. See *id.* Performance on the task improves with age, indicating a decrease in susceptibility to choosing based on the prospect of instant gratification. See *id.*

270. See discussion *supra* Section II.C.2.b.

271. See Kenneth J. King, *Waiving Childhood Goodbye: How Juvenile Courts Fail to Protect Children from Unknowing, Unintelligent, and Involuntary Waivers of Miranda Rights*, 2006 Wis. L. Rev. 431, 454 (2006) (“Very few states expressly require consideration of whether the juvenile’s level of knowledge and maturity enabled the juvenile to make a reasoned decision in the totality calculus.”).

272. See discussion *supra* Section II.D.1.a–b.

of consent.²⁷³ Without the essential regulatory functions of the limbic system,²⁷⁴ juveniles' focus on rewards makes it impossible to fully comprehend the consequences of deciding to provide a sample.²⁷⁵ For a waiver to be knowing and intelligent, the suspect must fully comprehend the consequences of waiving rights.²⁷⁶ Additionally, juvenile suspects are driven by the instant gratification of physical needs, such as hunger and thirst, and are more likely to accept a meal or drink from a law enforcement officer than a similarly situated adult.²⁷⁷ Law enforcement's uses for discarded trash may not be immediately apparent to a juvenile focused on the immediate future's rewards rather than the distant future's risks.

3. Juveniles Cannot Consent Due to Emotional Processing and Lack of Impulse Control

In the emotionally charged situation of a police encounter or interrogation, a juvenile suspect may process events and stimuli differently than an adult suspect.²⁷⁸ Juveniles rely more heavily on the emotional processing of the limbic system than on the cognitive-regulatory systems of the prefrontal cortex.²⁷⁹ "Heightened emotional arousal, time pressure, and peer influence" characterize the decisions juveniles make before engaging in criminal activity.²⁸⁰ Immediately after law enforcement apprehends and questions a suspect, the emotional arousal from the criminal activity has likely not yet subsided.²⁸¹ Therefore, the juvenile suspect may still be in the heightened emotional state that makes logical processing more difficult.²⁸²

Emotional aspects of police encounters fall into the "totality of the circumstances" test that courts employ when determining whether a juvenile suspect has voluntarily agreed to provide a sample for DNA

273. See discussion of consent *supra* Section II.B.1.b.

274. See discussion *supra* Section II.C.2.d.

275. See SCOTT & STEINBERG, *supra* note 172, at 47; see also *Moran v. Burbine*, 475 U.S. 412, 421 (1986) (holding that a court may only conclude a knowing and intelligent waiver where there is "both an uncoerced choice and the requisite level of comprehension").

276. See *Moran*, 475 U.S. at 421.

277. See *Ransom and Southall*, *supra* note 1.

278. See discussion *supra* Section II.D.1.c.

279. See Barry C. Feld, *Competence and Culpability: Delinquents in Juvenile Courts, Youths in Criminal Courts*, 102 MINN. L. REV. 473, 560 (2017); see also discussion *supra* Section II.D.1.c.

280. Laurence Steinberg et al., *Are Adolescents Less Mature than Adults? Minors' Access to Abortion, the Juvenile Death Penalty, and the Alleged ABA "Flip-Flop"*, 64 AM. PSYCHOLOGIST 7,7 (2009).

281. See Feld, *supra* note 279, at 557.

282. See *id.* at 556.

profiling.²⁸³ In order to find that a DNA sample was provided voluntarily, courts must find that the situation was free from “any scintilla of coercion.”²⁸⁴ Factors such as the suspect’s age, level of education, lack of advice of the suspect’s constitutional rights, the length of the detention, the nature of the interrogation, and deprivation of food or sleep are all considered to determine whether the suspect was coerced.²⁸⁵ The suspect’s emotional state arguably affects each one of these factors.²⁸⁶ The U.S. Supreme Court has observed the emotionally taxing quality of police interrogations, noting that events that “would leave a man cold and unimpressed can overawe and overwhelm a young lad in his early teens.”²⁸⁷

The emotional impact of police custody, questioning, and the prospect of trial and conviction is stressful for young adults.²⁸⁸ Thus, a juvenile suspect in an overwhelming situation may not understand or anticipate that there is no reasonable expectation of privacy in discarded items, and may be more likely to throw something away in a public place or police station without thinking of the more far-reaching consequences.²⁸⁹ Adolescents make different decisions in different situations.²⁹⁰ A police interrogation, more often than not, is an environment defined by emotionally based decisions.²⁹¹ Courts should not consider juveniles, as a class, as able to consent, whether expressly or impliedly, to providing abandoned DNA samples. Consent cannot be knowing, intelligent, and voluntary when the suspect is overwhelmed and incapable of processing the situation.²⁹²

Indeed, a person must *unequivocally* give consent, and not merely defer to the apparent authority of the police.²⁹³ A juvenile suspect in an emotionally charged situation is likely to be scared, and will probably defer to the requests of law enforcement.²⁹⁴ But that deference cannot count as knowing, intelligent, and voluntary consent without maturity of the relevant brain structures.²⁹⁵

283. See *People v. K.N.*, 87 N.Y.S. 3d 862, 868 (2019).

284. See *id.*

285. See *id.*

286. See discussion *supra* Section II.D.1.c.

287. See *Haley v. State of Ohio*, 332 U.S. 596, 599 (1948).

288. See *J.D.B. v. North Carolina*, 564 U.S. 261, 267 (2011).

289. See discussion *supra*, Section II.D.3.

290. See *Using Adolescent Brain Research to Inform Policy: A Guide for Juvenile Justice Advocates*, NAT’L JUV. JUST. NETWORK (Sept. 2012), <http://bit.ly/2NhiHyx> [hereinafter *A Guide for Juvenile Justice Advocates*].

291. See Aldert Vrij et al., *Psychological Perspectives on Interrogation*, 12 PERSP. ON PSYCHOL. SCI. 1, 13 (2017).

292. See discussion *supra* Part I.

293. See *V.H. v. State*, 903 So.2d. 321, 322 (Fla. Dist. Ct. App. 2005).

294. See discussion *supra* Part I.

295. See discussion *supra* Section II.D.

4. Juveniles Cannot Consent Due to Delayed Maturity of Executive Functions

Finally, juvenile suspects are incapable of consenting to abandoned DNA collection and database-storage because of the delayed maturity of their executive functions.²⁹⁶ Juveniles in high-stress situations suspected of committing a crime are likely to have strong emotional reactions, coupled with the general fear and anxiety that many individuals feel when around law enforcement.²⁹⁷ The regions of the brain that control executive functions are still developing during adolescence.²⁹⁸ The prefrontal cortex does not fully mature until the early twenties.²⁹⁹ Thus, a teenager accused of a crime will not have the full judgment and decision-making capabilities that an adult would have.³⁰⁰

A teenager's executive functioning deficiencies are combined with the heightened emotional reactions resulting from the immaturity of the limbic system.³⁰¹ The heightened emotional state combined with inability to fully appreciate all aspects of a decision makes juvenile suspects with underdeveloped prefrontal cortices incapable of consenting to abandoned DNA collection.³⁰² Juveniles cannot give knowing, intelligent, and voluntary consent if some of the faculties controlling knowledge are not fully developed.³⁰³ Thus, teenagers whose brains are still developing lack the cognitive capacity to give express or implied consent regarding their abandoned DNA.

B. Recommendation

Juvenile suspects, as a class, must not be considered capable of expressly or impliedly consenting to abandoned DNA collection. The physical and psychological immaturity of the adolescent brain presents difficulties with the requirement that consent be knowing, intelligent, and voluntary. When considering the issue of abandoned DNA collection from juvenile suspects, courts should take the view of the *Greenwood* dissent.³⁰⁴ A juvenile suspect's expectation of privacy in an item discarded as trash may not be the same as an adult's due to the juvenile's limited cognitive capacity.³⁰⁵ Applying the totality of the circumstances test to juvenile consent determinations would effectively treat juveniles

296. See discussion *supra* Section II.D.1.d.

297. See Vrij et al., *supra* note 291, at 18.

298. See discussion *supra* Section II.D.1.d.

299. See *A Guide for Juvenile Justice Advocates*, *supra* note 290.

300. See discussion *supra* Section II.D.2.d.

301. See SCOTT & STEINBERG, *supra* note 172, at 48.

302. See discussion *supra* Section II.D.1.d.

303. See discussion *supra* Section III.A.

304. See discussion *supra* Section II.C.1.

305. See discussion *supra* Section II.C.1.

as adults throughout the criminal justice process, a practice the Supreme Court cautions against.³⁰⁶

1. Bright-Line Rule: Juveniles Cannot Consent

A bright-line rule that juveniles cannot consent to abandoned DNA collection is a dramatic departure from the currently employed totality of the circumstances test.³⁰⁷ And while a departure, a bright-line rule will more explicitly take juveniles' constitutional rights and neurological differences into account. The totality of the circumstances approach purports to consider a multitude of factors,³⁰⁸ but a bright-line rule eliminates the possibility of law enforcement and courts abusing the discretion that comes with multi-factor tests.

Critics of the bright-line approach may argue that adults face the same issues as juvenile suspects regarding future orientation, salience of rewards, impulse control, and executive functions.³⁰⁹ However, the scientific distinction between adults' and juveniles' physical and emotional maturity shows that juveniles lack the emotional maturity to knowingly, intelligently, and voluntarily consent to DNA collection.³¹⁰ Similarly, juveniles do not possess the physical maturity to consent until their brains finish maturing in their early twenties.³¹¹ Because juveniles lack both physical neurological maturity and emotional maturity,³¹² even the most emotionally immature of adults has a distinct advantage over the physically immature juvenile when courts analyze each individual's ability to consent.³¹³ Therefore, a bright-line rule determining that juvenile suspects, as a class, do not have the capacity to consent to abandoned DNA collection protects such suspects from coercion, law enforcement overreach, and Fourth Amendment violations until their brains are physically mature enough to consent.

306. See *J.D.B. v. North Carolina*, 564 U.S. 261, 274 (2011) (“Our history is replete with laws and judicial recognition’ that children cannot simply be viewed as miniature adults.”).

307. See discussion *supra* Section II.B.2.b.

308. See *King*, *supra* note 271, at 454 (citing *State v. Benoit*, 490 A.2d 295, 302 (N.H. 1985)). *Benoit* set out a 15-factor test for examining juvenile waivers of *Miranda* rights, “the most explicitly expansive” definition of totality of the circumstances. See *id.* at n.97.

309. See discussion *supra* Section II.D.1.

310. See discussion *supra* Section II.D.1.c.

311. See discussion *supra* Section II.D.1.

312. See discussion *supra* Section III.A.1.a.

313. See discussion *supra* Section II.D.2.d.

IV. CONCLUSION

The Fourth Amendment to the Constitution protects citizens from “unreasonable” searches and seizures.³¹⁴ The stories of Adam,³¹⁵ K.N.,³¹⁶ the twelve-year-old boy from New York,³¹⁷ and countless others suggest that collecting abandoned DNA from juvenile suspects is a widespread practice.³¹⁸ However, given the physical immaturity of juveniles’ brains, and their resulting psychological immaturity and deficiencies, it is difficult to label collection of juveniles’ abandoned DNA as a “reasonable” search.³¹⁹ A bright-line rule that juvenile suspects, as a class, cannot consent to abandoned DNA collection will fulfill the objectives of the Fourth Amendment and protect America’s youth from invasions to their privacy that they may not fully understand.

314. See U.S. CONST. amend. IV.

315. See *supra* notes 9–14 and accompanying text.

316. See *supra* notes 255–258 and accompanying text.

317. See *supra* notes 1–8 and accompanying text.

318. See discussion *supra* Part I; see also discussion *supra* Part III.

319. See discussion *supra* Part III.