STATE V. CARVER: A CAUTIONARY TALE ABOUT THE USE OF TOUCH DNA AS INCULPATORY EVIDENCE IN NORTH CAROLINA

INTRODUCTION

"[E]very contact leaves a trace."[1] The advent of touch DNA testing has stretched this maxim of forensic science to its limits.[2] Human beings shed tens of thousands of skin cells every day.[3] Every time an individual makes contact with a surface or an object, the potential for skin cell transfer exists.[4] Modern science enables forensic analysts to test touch DNA samples using methods similar to those employed to test traditional sources of DNA evidence, such as blood and saliva.[5] However, because of reliability concerns regarding the analysis of touch DNA samples, inculpatory touch DNA evidence has garnered little attention, much less support, from the court system.[6]

In 2012, North Carolina became one of the first states to address the sufficiency of touch DNA evidence to carry a case to a jury.[7] Mark Bradley Carver was convicted of first-degree murder after a laboratory test revealed that a touch DNA sample from the exterior of the victim's vehicle matched his touch DNA profile.[8] The North Carolina Court of Appeals, over a vigorous dissent, held that this evidence was sufficient to withstand Mr. Carver's motion to

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1. Coined by one of the pioneers of forensic science, Edmond Locard, this maxim is known as Locard's exchange principle. John Horswell & Craig Fowler, *Associative Evidence—The Locard Exchange Principle*, *in* THE PRACTICE OF CRIME SCENE INVESTIGATION 45, 45–46 (2004).

2. Courts and commentators use the terms "touch DNA" and "trace DNA" interchangeably to refer to the same type of DNA evidence. This Note refers to this type of evidence as touch DNA.

3. Angela L. Williamson, *Touch DNA: Forensic Collection and Application to Investigations*, 18 J. ASS'N CRIME SCENE RECONSTRUCTION 1, 1 (2012), *available at* http://www.acsr.org/wp-content/uploads/2012/01/Williamson.pdf.

4. *Id.*

5. *See* Victoria Kawecki, Comment, *Can't Touch This? Making a Place for Touch DNA in Post-Conviction DNA Testing Statutes*, 62 CATH. U. L. REV. 821, 829 (2013).

6. *See* State v. Carver, 725 S.E.2d 902, 909 (N.C. Ct. App. 2012) (Hunter, Jr., J., dissenting) ("I cannot find even one case in North Carolina that has reviewed the sufficiency of touch DNA evidence to establish the identity of an accused, much less any case in this state that even discusses the accuracy of touch DNA."), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013); Kawecki, *supra* note 6, at 829–30.

7. *See Carver*, 725 S.E.2d 902.

8. *See id.* at 903–04.

dismiss for insufficient evidence.[9] The North Carolina Supreme Court affirmed the decision per curiam.[10]

While the threshold admissibility of touch DNA evidence is questionable at best, this important question is not within the scope of this Note.[11] Rather, because there was no argument on appeal about the trial court's admission of testimony concerning touch DNA,[12] the critical issue becomes whether touch DNA evidence is sufficient to identify the perpetrator, an essential element of any crime.

This Note does not suggest that North Carolina trial courts should never admit touch DNA evidence. Nor does it maintain that North Carolina appellate courts should never consider this type of evidence when reviewing a trial court's denial of a motion to dismiss for insufficient evidence. Instead, this Note argues that because of the significant reliability concerns regarding touch DNA testing, relying on touch DNA evidence as the primary basis for upholding a trial court's denial of a motion to dismiss, with very little treatment of touch DNA evidence by the courts, sets an unwise precedent. Accordingly, this Note argues that the North Carolina Supreme Court should overturn or significantly circumscribe the *Carver* decision.

Part I examines *State v. Carver* and analyzes the differing views on touch DNA that the majority and dissenting opinions articulated.

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9. *Id.* at 905; *see also id.* at 906–10 (Hunter, Jr., J., dissenting).

10. *Carver*, 736 S.E.2d at 173.

11. The defendant did not raise admissibility on appeal. *See Carver*, 725 S.E.2d 902. Moreover, at the time *Carver* was decided, North Carolina did not adhere to the federal *Daubert* standard for the admissibility of expert testimony. *Compare* Howerton v. Arai Helmet, Ltd., 597 S.E.2d 674, 693 (N.C. 2004) ("North Carolina is not, nor has it ever been, a *Daubert* jurisdiction."), *with* State v. McGrady, 753 S.E.2d 361, 367 (N.C. Ct. App. 2014) ("Given the changes wrought by [the] legislature . . . it is clear that amended Rule 702 should be applied pursuant to the federal standard as articulated in *Daubert*."), *review allowed*, 758 S.E.2d 864 (N.C. 2014). The approach under *Howerton* was "decidedly less mechanistic and rigorous than the 'exacting standards of reliability' demanded by the federal [*Daubert*] approach." *Howerton*, 596 S.E.2d at 690 (quoting Weisgram v. Marley Co., 528 U.S. 440, 455 (2000)). At any rate, it seems more likely that touch DNA evidence would be admitted under the *Howerton* approach than it would be under the *Daubert* approach because "the *Howerton* approach is clearly much more deferential to experts than *Daubert* has proved to be." John M. Conley & Scott W. Gaylord, *We Are Not a* Daubert *State—But What Are We? Scientific Evidence in North Carolina After* Howerton, 6 N.C. J. L. & TECH. 289, 302 (2005). Whether North Carolina trial courts should admit touch DNA evidence in the first place is therefore an area for further inquiry, and may depend on whether the North Carolina Supreme Court accepts *McGrady*'s application of the *Daubert* standard to Rule 702. However, it is another question altogether whether touch DNA evidence, if admitted as it was in *Carver*, is sufficient to withstand the defendant's motion to dismiss.

12. *See Carver*, 725 S.E.2d 902.

Part II attempts to situate touch DNA evidence historically by examining how courts initially approached similar evidence, including fingerprint evidence and traditional DNA evidence. Part III argues that the *Carver* decision is legally unsound and establishes unwise judicial precedent. This Part analyzes the implications of *Carver* and its potential as precedent for upholding convictions based solely or primarily on touch DNA evidence. Finally, Part IV concludes that the North Carolina Supreme Court should reject *Carver*'s acceptance of touch DNA as sufficient inculpatory evidence to withstand a motion to dismiss.

I. *STATE V. CARVER*: TOUCH DNA EVIDENCE HELD SUFFICIENT TO WITHSTAND MOTION TO DISMISS

A. Factual Background and Trial

On the morning of May 5, 2008, Mark Carver and his cousin, Neal Cassada, drove to their favorite fishing location on the banks of the Catawba River in Mount Holly, North Carolina.[13] The two cousins fished for several hours.[14] During this time, two jet skiers discovered the body of a UNC-Charlotte college student on the banks of the river, not far from where the cousins were fishing.[15] Mr. Carver spoke with police and told officers that he had been fishing when he heard a scraping sound followed by the sound of two jet skis, a woman screaming "the F word," and a man yelling for someone to call the police.[16] Mr. Carver maintained that he had been fishing during the time police said the body had been found.[17] The coroner was unable to determine the victim's time of death.[18] Later that night, Mr. Carver returned to the river to retrieve fishing equipment that he had forgotten.[19]

Police found the following items wrapped around the victim's neck: a bungee cord, a drawstring from the victim's sweatshirt, and a ribbon from a gift bag in the victim's car.[20] DNA recovered from these items did not match either Mr. Carver or Mr. Cassada.[21] No DNA samples were taken from any of the other individuals who were near the area where the body was found, including the jet

13. Defendant-Appellant's Brief at 6, *Carver*, 725 S.E.2d 902 (No. COA11-1382); Diane Turbyfill, *Supreme Court Upholds Conviction in Death of UNC Charlotte Student*, GASTON GAZETTE (Jan. 25, 2013, 1:29 PM), http://www.gastongazette.com/supreme-court-upholds-conviction-in-death-of-unc-charlotte-student-1.84473?page=0.

14. *See* Defendant-Appellant's Brief, *supra* note 13, at 5–6.

15. *Id.* at 4–6.

16. *Id.* at 6.

17. *Id.*

18. *Carver*, 725 S.E.2d at 908 (Hunter, Jr., J., dissenting).

19. *Id.*

20. *See id.* at 903 (majority opinion).

21. Defendant-Appellant's Brief, *supra* note 13, at 8–9.

skiers, another fisherman, and construction workers who were working on a construction site close to the location of the body.[22] Furthermore, there was no evidence of robbery or sexual assault, and Mr. Carver had no connection to the victim.[23]

Except for trace amounts of touch DNA found on the outside of the victim's vehicle, Mr. Carver's DNA was not found anywhere at the crime scene, nor was his DNA found anywhere on the victim or on any of the three ligatures used to suffocate the victim.[24] Investigators also recovered thirteen fingerprints from the victim's car.[25] Despite the State's contention at trial that Mr. Carver pushed the victim's car down the bank into the river, none of the fingerprints recovered from the car matched Mr. Carver.[26] When police confronted Mr. Carver about the touch DNA, he denied that he had been to the crime scene.[27]

The State of North Carolina indicted Mr. Carver and his cousin, Neal Cassada, on charges of first-degree murder and conspiracy to commit first-degree murder.[28] Mr. Cassada's trial was scheduled for October 2010, but he died of a heart attack on the eve of the first day of trial.[29] Mr. Carver pled not guilty, and his case was tried before a jury in Gaston County, North Carolina, during the week of March 14, 2011.[30] Mr. Carver's case was thoroughly examined in the press and debated on social media.[31] The case eventually received national attention in 2011 when an episode of Dateline NBC highlighted the mysterious nature of the case.[32]

At the close of the evidence, Mr. Carver moved to dismiss both charges for insufficient evidence.[33] The trial court granted the motion to dismiss the conspiracy charge but denied the motion to

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22. *See id.* at 4, 6–7.

23. Defendant-Appellant's New Brief at 17, *Carver*, 736 S.E.2d 172 (No. 301A12).

24. *Carver*, 725 S.E.2d at 908 (Hunter, Jr., J., dissenting).

25. Defendant-Appellant's Brief, *supra* note 13, at 8.

26. *Id.* at 8, 21.

27. *Carver*, 725 S.E.2d at 904.

28. *Id.* at 903; Diane Turbyfill, *Murder Case Closed, Fascination Persists*, GASTON GAZETTE (May 3, 2013, 11:55 PM), http://m.shelbystar.com/news/local/murder-case-closed-fascination-persists-1.138323; *see Defense: Inmate Confessed to Killing UNCC Student*, WRAL.COM (Feb. 3, 2009), http://www.wral.com/news/state/story/4456884/.

29. Turbyfill, *supra* note 28.

30. *Carver*, 725 S.E.2d at 903; Defendant-Appellant's Brief, *supra* note 13, at 2.

31. *See* Turbyfill, *supra* note 28.

32. *Id.*; *see* NBC NEWS: INSIDE DATELINE, *Jul. 8: 'Mystery on the Catawba,' Casey Anthony Update* (Jul. 6, 2011, 8:55 AM), http://insidedateline.nbcnews.com/_news/2011/07/06/7026586-jul-8-mystery-on-the-catawba-casey-anthony-update. To view the episode, see *Dateline on ID – Mystery on the Catawba River*, YOUTUBE, https://www.youtube.com/watch?v=7_a6UkscA4 (last visited Sept. 7, 2014).

33. Defendant-Appellant's Brief, *supra* note 13, at 11.

dismiss the first-degree murder charge.[34] On March 21, 2011, the jury found Mr. Carver guilty of first-degree murder, and the trial court sentenced Mr. Carver to life in prison without the possibility of parole.[35]

B. Court of Appeals: Majority

Mr. Carver's principal argument on appeal was that the trial court committed reversible error when it denied his motion to dismiss because the evidence was insufficient to establish that he was the perpetrator.[36] The majority first noted that Mr. Carver's conviction rested solely on circumstantial evidence: he was fishing near the crime scene on the day the body was discovered, he denied touching the victim's car, and DNA found on the exterior of the vehicle matched, "with an extremely high probability," his DNA.[37] Omitting even a passing reference to the fact that the DNA recovered from the car was touch DNA,[38] the court held that a reasonable inference could be drawn from these circumstantial facts that Mr. Carver was the perpetrator.[39]

According to the majority, Mr. Carver's case was directly analogous to *State v. Miller*,[40] where "the defendant's statement that he was never present at, and never touched any part of, the crime scene was shown by physical evidence—in that case, fingerprints; in this case, DNA—to be false."[41] The majority in *Carver* thus equated fingerprint evidence with touch DNA evidence, notwithstanding the court's failure to note that the DNA on the vehicle was touch DNA:

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34. *Carver*, 725 S.E.2d at 904; Defendant Appellant's New Brief, *supra* note 23, at 2.

35. *Carver*, 725 S.E.2d at 904; *see also* Barry Leibowitz, *Irina Yarmolenko Update: Mark Carver Guilty of Murder in 2008 Death of UNC-Charlotte Student*, CBS NEWS (Mar. 22, 2011, 8:32 AM), http://www.cbsnews.com/news/irina-yarmolenko-update-mark-carver-guilty-of-murder-in-2008-death-of-unc-charlotte-student/.

36. *Carver*, 725 S.E.2d at 904. Mr. Carver's other arguments did not involve the sufficiency of touch DNA evidence. *See id.* at 905–06. Nor did these arguments affect the merits of his appeal. *See id.*

37. *Id.* at 904.

38. *See id.* at 903–06; *see also infra* notes 46–49 and accompanying text.

39. *Carver*, 725 S.E.2d at 905.

40. 220 S.E.2d 572 (N.C. 1975).

41. *Carver*, 725 S.E.2d at 904 (citing *Miller*, 220 S.E.2d at 575).

> We note that although the physical evidence in *Miller* was the defendant's fingerprints and not his DNA, the logic of the rule from *Miller* applies equally to DNA and fingerprints, and the only potential difference in application of the rule to DNA is the strength of the conclusion as to the defendant's presence supported by the physical evidence, *i.e.*, that fingerprint evidence may be so accurate as to conclusively establish a defendant's presence while DNA evidence may not.[42]

By characterizing the touch DNA evidence found on the vehicle as simply "DNA," the majority implicitly ascribed the same weight to fingerprint evidence, traditional DNA evidence, and touch DNA evidence, at least as far as a motion to dismiss for insufficient evidence was concerned.[43] For the majority, then, the touch DNA evidence and Mr. Carver's statement that he did not touch the vehicle were enough to sustain the trial court's denial of Mr. Carver's motion to dismiss.[44]

C. Court of Appeals: Dissent

Judge Robert N. Hunter, Jr., disagreed with the majority's acceptance of touch DNA evidence as substantial opportunity evidence of Mr. Carver's guilt.[45] The dissent would have held that the trial court erred in denying Mr. Carver's motion to dismiss because of the "absence of motive evidence *combined* with the lack of opportunity evidence."[46]

The dissent noted the tension between the majority's "great emphasis" on the fact that Mr. Carver's DNA was found on the victim's vehicle and the majority's "fail[ure] to mention that this DNA . . . was *touch* DNA."[47] This troubled the dissent because touch DNA testing "is relatively new and not as accurate as blood or saliva DNA testing."[48] Furthermore, it was noteworthy for the dissent that Mr. Carver's "DNA (touch or otherwise) was not found anywhere else on the outside or the inside of the vehicle . . . nor was it found on any of the three ligatures used to suffocate the victim."[49]

At bottom, the dissent disagreed with the majority's reliance on *State v. Miller* and apparent equation of touch DNA evidence with both fingerprint evidence and traditional DNA evidence.[50] The dissent distinguished *Miller* based on the crucial fact that the

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42. *Id.* at 904 n.2.
43. *See id.*
44. *Id.* at 905.
45. *Id.* at 906–09 (Hunter, Jr., J., dissenting).
46. *Id.* at 907.
47. *Id.* at 908.
48. *Id.*
49. *Id.* The dissent noted that investigators discovered DNA from Mr. Carver's cousin, but not from Mr. Carver, inside the vehicle near the passenger's seat. *Id.*
50. *See id.* at 908–09.

evidence discovered at the crime scene in *Carver* was touch DNA evidence, not fingerprint evidence.[51] Criticizing the majority's decision not to address "the accuracy and ubiquity of DNA analysis vis-à-vis fingerprint analysis,"[52] the dissent expressed concern over the reliability of touch DNA evidence.[53] Moreover, the dissent was especially critical of the majority's decision to neglect any discussion of touch DNA because the dissent could not find a case in North Carolina that considered either the sufficiency of touch DNA evidence to withstand a motion to dismiss or its accuracy in general.[54]

The dissent also illustrated a problem presented by touch DNA evidence that is not associated with traditional DNA evidence: the "phenomenon known as secondary skin cell transfers."[55] "[I]f person A touches person B, and person B touches a pen, person A's [touch] DNA can be found on the pen."[56] Finally, the dissent was not persuaded by the expert testimony on touch DNA because the State's own expert stated that it was impossible to tell when Mr. Carver's touch DNA sample was deposited on the vehicle.[57] The dissent concluded that the *reasonable* mind standard would not allow a court to hold that the evidence could survive a motion to dismiss because the evidence raised, at most, a mere suspicion that Mr. Carver was the perpetrator.[58]

D. North Carolina Supreme Court Rubber Stamps the Sufficiency of Touch DNA Evidence

Mr. Carver appealed, and the parties filed briefs addressing the sufficiency of the evidence to withstand Mr. Carver's motion to dismiss and sustain Mr. Carver's conviction.[59] The legal community fully expected the North Carolina Supreme Court to seize the opportunity to examine the use of touch DNA evidence, especially in light of the strong dissenting opinion and given that the issue was one of first impression.[60] The North Carolina Supreme Court heard oral arguments on January 8, 2013, and promptly issued a per

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51. *Id.* at 909. Another critical distinction between *Carver* and *Miller* is that Mr. Carver never admitted to touching the vehicle, while the defendant in *Miller* admitted to touching the padlock. *See* discussion *infra* Subpart III.A.

52. *Carver*, 725 S.E.2d at 909 (Hunter, Jr., J., dissenting).

53. *Id.* at 908.

54. *Id.* at 909.

55. *Id.*

56. *Id.*

57. *Id.*

58. *Id.* at 910.

59. *Id.* at 904 (majority opinion). Because of Judge Robert N. Hunter, Jr.'s dissenting opinion, Mr. Carver was entitled to an appeal of right to the North Carolina Supreme Court. *See* N.C. GEN. STAT. § 7A-30 (2013).

60. *See* David Donovan, *Two Criminal Issues, Two Unexplained Rulings from N.C. Supreme Court*, N.C. LAW. WKLY., Feb. 8, 2013.

curiam opinion upholding Mr. Carver's conviction on January 25, 2013.[61] North Carolina's highest court thus placed its stamp of approval on the sufficiency of touch DNA evidence to establish the identity and opportunity of a criminal defendant.[62]

II. BACKGROUND: NORTH CAROLINA LAW, FINGERPRINT EVIDENCE, TRADITIONAL DNA EVIDENCE, AND TOUCH DNA EVIDENCE

A. Motion to Dismiss for Insufficient Evidence

Because *Carver* turned on whether the touch DNA evidence recovered from the victim's vehicle was sufficient to allow Mr. Carver's case to proceed to a jury, this Part first describes North Carolina's approach to a motion to dismiss for insufficient evidence.[63] In order to obtain a first-degree murder conviction in North Carolina, the State must prove beyond a reasonable doubt that the defendant killed the victim with malice aforethought and with premeditation and deliberation.[64] On a criminal defendant's motion to dismiss for insufficient evidence at the close of the evidence, the trial court determines whether there is substantial evidence of every essential element of the crime and substantial evidence that the defendant was the perpetrator.[65] This latter consideration was the point of departure in *Carver*: whether the touch DNA evidence constituted substantial evidence that Mr. Carver was the perpetrator.[66]

The North Carolina Supreme Court has construed "substantial evidence" to mean such "relevant evidence that a reasonable mind might accept as adequate to support a conclusion."[67] Even with the

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61. *Carver*, 736 S.E.2d at 172–73.

62. *See id.*

63. North Carolina law provides:

> When on the trial of any criminal action in the superior or district court, the State has introduced its evidence and rested its case, the defendant may move to dismiss the action, or for judgment as in case of nonsuit. If the motion is allowed, judgment shall be entered accordingly; and such judgment shall have the force and effect of a verdict of 'not guilty' as to such defendant. If the motion is refused and the defendant does not choose to introduce evidence, the case shall be submitted to the jury as in other cases, and the defendant may on appeal urge as ground for reversal, the trial court's denial of his motion without the necessity of the defendant's having taken exception to such denial.

N.C. GEN. STAT. § 15-173 (2013).

64. N.C. GEN. STAT. § 14-17(a) (2013); State v. Johnson, 344 S.E.2d 775, 781 (N.C. 1986). Although North Carolina recognizes other instances of first-degree murder, such as felony murder and murder by poison, lying in wait, imprisonment, starving, or torture, these are not relevant to the *Carver* decision. *See Johnson*, 344 S.E.2d at 781.

65. *See, e.g.*, *Carver*, 725 S.E.2d at 904.

66. *See id.* at 904–05.

67. *See, e.g.*, State v. Cross, 483 S.E.2d 432, 434 (N.C. 1997).

"CSI effect" that pervades modern juries, circumstantial evidence is a common method of proof in the courtroom.[68] Indeed, most murder convictions are obtained through the use of circumstantial evidence.[69]

When circumstantial evidence is the only evidence used to establish the defendant as the perpetrator, North Carolina courts consider "'proof of motive, opportunity, capability, and identity' to determine whether a reasonable inference of the defendant's guilt may be inferred or whether there is merely a suspicion that the defendant is the perpetrator."[70] Motive, opportunity, capability, and identity evidence are "merely different ways to show that a particular person committed a particular crime."[71] Because the latter three types of evidence are so similar, capability and identity evidence can be collapsed into the category of opportunity evidence.[72] If the evidence is "'sufficient only to raise a suspicion or conjecture as to either the commission of the offense or the identity of the defendant as the perpetrator of it,' the motion to dismiss should be allowed."[73] In order for a court to hold that the State established the defendant's opportunity to commit the charged crime, "the State must have presented at trial evidence not only placing the defendant at the scene of the crime, but placing him there at the time the crime was committed."[74]

If there is "evidence of *both* motive and opportunity," then whether such evidence "will be sufficient to survive a motion to dismiss" depends on "the strength . . . as well as [the availability of other] evidence, rather than an easily quantifiable 'bright line' test."[75] However, "evidence of *either* motive or opportunity alone is

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68. *See* MICHAEL LYNCH ET AL., TRUTH MACHINE: THE CONTENTIOUS HISTORY OF DNA FINGERPRINTING, at x–xi (2008) ("At a deeper level, however, 'the *CSI* effect' may be viewed as indicative of awe and anxiety about the perceived power of scientific evidence, particularly DNA evidence.").

69. State v. Banks, 706 S.E.2d 807, 813 (N.C. 2011).

70. State v. Pasteur, 697 S.E.2d 381, 385 (N.C. 2010) (quoting State v. Bell, 309 S.E.2d 464, 467 (N.C. Ct. App. 1983), *cert. granted*, 313 S.E.2d 592 (N.C. 1984), *aff'd per curiam*, 316 S.E.2d 72 (N.C. 1984)).

71. State v. Bell, 309 S.E.2d 464, 467 (N.C. Ct. App. 1983).

72. *See, e.g.*, State v. Stone, 373 S.E.2d 430, 434 (N.C. 1988) (reasoning that the lack of motive evidence was overcome by overwhelming evidence of opportunity); State v. Hayden, 711 S.E.2d 492, 500 (N.C. Ct. App. 2011) (reasoning that the State presented substantial evidence of motive but insufficient opportunity evidence that merely placed the defendant near the location where police discovered the victim); *Bell*, 309 S.E.2d at 468–69 (holding that the trial court erred by denying defendant's motion to dismiss, despite substantial opportunity evidence, because the State presented no evidence of motive).

73. *Hayden*, 711 S.E.2d at 494 (quoting State v. Scott, 573 S.E.2d 866, 868 (N.C. 2002)).

74. *Id.* at 497.

75. *Bell*, 309 S.E.2d at 468.

insufficient to carry a case to the jury."[76] When there is no evidence of motive, as in *Carver*, the question of whether to reverse the trial court's denial of the motion to dismiss hinges on whether there was substantial evidence of the defendant's opportunity to commit the alleged crime.[77]

The North Carolina Supreme Court has set a relatively high bar for the type of evidence that must be presented to constitute sufficient opportunity evidence.[78] For example, in *Cutler*, the evidence tended to show that witnesses saw a truck similar to the defendant's at the scene of the crime before and after the body was discovered, that the truck was covered in human blood, that a relative described the defendant on the day of the crime as drunk and "bloody as a hog," and that the defendant was found wearing bloody clothing the day of the murder.[79] Despite ample incriminating evidence, the court held that there was insufficient opportunity evidence connecting the defendant to the murder.[80]

B. Fingerprint Evidence

American courts have relied on fingerprint evidence in criminal trials since at least 1911.[81] The North Carolina Supreme Court first considered fingerprint evidence in 1931.[82] By 1975, the court acknowledged that the use of fingerprint evidence to identify a defendant was sufficiently well-established such that "in many cases . . . courts will take judicial notice thereof."[83] A primary reason for such universal acceptance was the accuracy and ubiquity of fingerprint evidence.[84]

However, examining the history of fingerprint evidence in the United States reveals that courts' wide acceptance of such evidence is traceable to the fact that the first courts to consider the issue "essentially took the word of the proffered experts themselves, the British courts, and generic authorities like encyclopedias that fingerprint evidence was reliable."[85] This is problematic because

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76. *Id.* at 467.

77. State v. Carver, 725 S.E.2d 902, 907 (N.C. Ct. App. 2012), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013) (Hunter, Jr., J., dissenting) ("In the case *sub judice*, . . . the State presented zero evidence of motive.").

78. *See* State v. Cutler, 156 S.E.2d 679, 682 (N.C. 1967) (reversing trial court's denial of a motion to dismiss in a murder case because of the lack of evidence of motive and insufficient opportunity evidence).

79. *Id.* at 680–81.

80. *Id.* at 682.

81. United States v. Crisp, 324 F.3d 261, 277 (4th Cir. 2003); *see, e.g.*, People v. Jennings, 96 N.E. 1077, 1081–83 (Ill. 1911).

82. *See* State v. Combs, 158 S.E. 252, 253 (N.C. 1931).

83. State v. Miller, 220 S.E.2d 572, 574 (N.C. 1975).

84. *See id.*

85. Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Rulings from* Jennings *to* Llera Plaza *and Back Again*, 41 AM. CRIM. L. REV. 1189, 1194 (2004).

subsequent courts simply relied on earlier decisions to establish the reliability of fingerprint evidence.[86] "Courts began admitting fingerprint evidence . . . with relatively little scrutiny, and later courts, relying on precedent, simply followed along."[87]

North Carolina was one of the states that followed along. For example, when the North Carolina Supreme Court first considered fingerprint evidence, the court relied on an American Law Reports annotation and a Mississippi state court case.[88] The court in *State v. Combs* held that fingerprint evidence was sufficient to establish the identity of the accused because fingerprint evidence "has, for a long time, been recognized by the courts" of the United States, England, and India.[89] Consequently, "[f]ingerprint examiners, the public, and the scientific community have tended to look to *the courts* for evidence of the reliability (or legitimacy) of fingerprint evidence."[90]

The majority in *Carver* relied on *State v. Miller*,[91] a case in which the North Carolina Supreme Court considered the sufficiency of fingerprint evidence to withstand a motion to dismiss.[92] In *Miller*, the defendant was convicted of breaking and entering and larceny for breaking into a launderette after hours and stealing candy, drinks, and cigarettes from the vending machines.[93] During the investigation, police recovered a single fingerprint from a padlock at the crime scene that matched the defendant's fingerprint profile.[94] Although initially the defendant denied ever touching the padlock, he eventually "*stipulated in open court at trial that the thumbprint was his.*"[95] The *Miller* court held that the fingerprint evidence, combined with the defendant's open court admission that he touched the padlock, was sufficient to withstand the defendant's motion to dismiss the breaking and entering charge.[96]

Two years later, in *State v. Irick*,[97] the North Carolina Supreme Court limited the scope of the sufficiency of fingerprint evidence.[98]

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86. *Id.*

87. United States v. Crisp, 324 F.3d 261, 277 (4th Cir. 2003) (Michael, J., dissenting) ("To put it bluntly, the precedent of prior admission, rather than exacting scientific scrutiny, led to its universal acceptance.").

88. State v. Combs, 158 S.E. 252, 254 (N.C. 1931).

89. *Id.*

90. Cole, *supra* note 85 ("Obviously, problems are posed when *the courts themselves* are called upon to evaluate this claim.").

91. 220 S.E.2d 572 (N.C. 1975).

92. *Id.* at 573; *see* State v. Carver, 725 S.E.2d 902, 904–05 (N.C. Ct. App. 2012), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013).

93. *Miller*, 220 S.E.2d at 573.

94. *Id.*

95. *Id.*

96. *Id.* at 575. The trial court's dismissal of the defendant's larceny charge for insufficient evidence was not challenged by the State on appeal. *Id.* at 573.

97. 231 S.E.2d 833 (N.C. 1977).

98. *See id.* at 841.

In *Irick*, the court explained that fingerprint evidence by itself would be sufficient to carry a case to the jury only if there was substantial evidence indicating that the defendant could have left the fingerprints only when the crime was committed.[99]

C. *Traditional DNA Evidence*

1. *Scientific Background*

In 1871, German biochemist Frederick Miescher reported the discovery of nucleic acid.[100] However, it was not until 1953 that Watson and Crick published their seminal work on the structure of deoxyribonucleic acid ("DNA").[101] DNA molecules, with their characteristic double helix structure, contain the entire genetic blueprint of human beings.[102]

In 1984, British geneticist Alec Jeffreys discovered variations in an individual's genetic sequence that resulted in the forensic testability of DNA evidence.[103] Jeffreys' method, called restricted fragment length polymorphism ("RFLP") testing, isolates nucleic acid compounds in certain sections of the DNA double helix in order to compare the sample to the source sample.[104] However, the RFLP testing method requires large DNA samples to produce accurate results.[105]

Today, the most common DNA testing technique involves short tandem repeat ("STR") analysis in combination with polymerase chain reaction ("PCR") amplification.[106] STR analysis distinguishes among individuals by examining specific areas of DNA.[107] PCR technology allows scientists to repeatedly replicate DNA and convert small DNA sample sizes into a usable sample.[108] Basically, PCR

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99. *Id.*

100. *See* Randi B. Weiss et al., *The Use of Genetic Testing in the Courtroom*, 34 WAKE FOREST L. REV. 889, 891 (1999).

101. *Id.* at 892. *See generally* James D. Watson & Francis H.C. Crick, *Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid*, *in* 171 NATURE 737 (1953), *reprinted in* 138 ANNALS INTERNAL MED. 581 (2003).

102. *See* Watson & Crick, *supra* note 101; Weiss et al., *supra* note 100, at 890–91.

103. Kawecki, *supra* note 5, at 826.

104. *Id.*; United States v. Jakobetz, 955 F.2d 786, 791 (2d Cir. 1992) (" [Ninety-nine] percent of the DNA molecules in each of us are the same. Certain sections of the DNA ladder, however, take different forms in different individuals. It is these areas where the base pairs differ between individuals, areas called "polymorphisms", which provide the basis for DNA identification and produce great significance for forensic testing.").

105. Kawecki, *supra* note 5, at 826.

106. Catherine Arcabascio, *Chimeras: Double the DNA-Double the Fun for Crime Scene Investigators, Prosecutors, and Defense Attorneys?*, 40 AKRON L. REV. 435, 449 (2007).

107. *Id.*

108. *Id.* at 448; Kawecki, *supra* note 5, at 826.

amplification resembles a "molecular Xeroxing machine."[109] Molecular biologists and forensic scientists prefer PCR-STR testing because this method "blends the speed and quantity-production of PCR analysis with the exactness of RFLP testing to create an improved technique."[110]

2. Traditional DNA Evidence in the Courtroom

Traditional DNA evidence, including blood, saliva, and semen, has been used forensically since 1985, when DNA profiling was first used in a criminal case in the United Kingdom.[111] The FBI subsequently adopted DNA profiling as a forensic tool in 1988.[112] Also in 1988, the Florida Court of Appeals became the first court in the United States to uphold on appeal the use of DNA evidence.[113] The court concluded that "[i]n contrast to evidence derived from hypnosis, truth serum[,] and polygraph, evidence derived from DNA print identification appears based on proven scientific principles."[114]

Two years later, in *State v. Pennington*,[115] the North Carolina Supreme Court upheld a first-degree rape conviction based on DNA evidence.[116] The court undertook a thorough review of traditional DNA evidence, reasoning that traditional DNA profiling utilized "established techniques considered reliable within the scientific community."[117] The court based its decision on testimony from well-qualified experts and prior judicial decisions from other courts.[118] Three years after *Pennington*, the North Carolina Court of Appeals considered traditional DNA evidence in the context of a motion to dismiss for insufficient evidence.[119] The court held that DNA evidence from semen found on the victim was sufficient to support the defendant's rape conviction.[120]

Less than five years after traditional DNA was first admitted as evidence in the United Kingdom, DNA profiling had been used in

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109. Arcabascio, *supra* note 106 (quoting Catherine Arcabascio, *Freeing the Innocent: Obtaining Post-Conviction DNA Testing in Florida*, 28 NOVA L. REV. 61, 77 (2003)).

110. Kawecki, *supra* note 5, at 827. In 2009, Chief Justice John Roberts stated that "there is no technology comparable" to PCR-STR testing. Dist. Attorney's Office for the Third Judicial Dist. v. Osborne, 557 U.S. 52, 62 (2009).

111. OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, GENETIC WITNESS: FORENSIC USES OF DNA TESTING 68 (1990).

112. Armstead v. State, 673 A.2d 221, 226 (Md. 1996).

113. Sally E. Renskers, Comment, *Trial by Certainty: Implications of Genetic "DNA Fingerprints"*, 39 EMORY L.J. 309, 314 (1990); *see* Andrews v. State, 533 So. 2d 841, 850 (Fla. Dist. Ct. App. 1988).

114. *Andrews*, 533 So. 2d at 850.

115. 393 S.E.2d 847 (N.C. 1990).

116. *Id.* at 847, 853–54.

117. *Id.* at 853.

118. *See id.* at 853–54.

119. *See* State v. Futrell, 436 S.E.2d 884, 893 (N.C. Ct. App. 1993).

120. *See id.* at 888, 892.

more than 10,000 U.S. cases.[121] Despite the initial positive judicial reaction to DNA as an identification and inculpation device, courts gradually became more skeptical and implemented more stringent standards and judicial oversight.[122] Eventually, the accuracy and reliability of traditional DNA evidence became sufficiently established in the judicial community.[123] Indeed, today many prosecutors and investigators consider DNA to be the "gold standard" of forensic evidence, akin to a smoking gun.[124] By 2000, the North Carolina Court of Appeals characterized traditional DNA evidence as "inherently reliable."[125]

D. Touch DNA Evidence

1. Scientific Background

Touch DNA is the DNA left behind from skin cells when people touch or come into contact with an object.[126] The method employed to test touch DNA is similar to the method used to test traditional sources of DNA, such as blood, semen, and saliva.[127] Forensic scientists first use PCR amplification to make copies of the genes, and then analysts mix in fluorescent compounds that attach to thirteen specific locations on the DNA molecule.[128] One primary difference between traditional DNA and touch DNA concerns the nature of the sample that undergoes the PCR-STR testing.[129]

Unlike traditional testing, which requires a visible sample of blood, saliva, or semen, touch DNA testing does not require a visible sample or even a bodily fluid.[130] Instead, touch DNA testing is possible even if the sample contains "only seven or eight cells from the outermost layer of . . . skin."[131] Touch DNA sampling methods

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121. *See* Henry C. Lee et al., *DNA Typing in Forensic Science: I. Theory and Background*, 15 AM. J. FORENSIC MED. & PATHOLOGY 269, 270 (1994).

122. *See* Kawecki, *supra* note 5, at 827–28 ("Poor quality evidence combined with more stringent standards for the admissibility of scientific evidence resulted in an unwillingness to admit DNA evidence and caused courts to subject DNA testing to 'considerably more intense scrutiny than any of the other forensic sciences.'" (footnotes omitted) (quoting RON C. MICHELIS ET AL., A LITIGATOR'S GUIDE TO DNA: FROM THE LABORATORY TO THE COURTROOM 215 (2008))).

123. *See* Dist. Attorney's Office for the Third Judicial Dist. v. Osborne, 557 U.S. 52, 62 (2009).

124. *See* Mark Hansen, *The Uncertain Science of Evidence*, 91 A.B.A. J. 48, 50 (2005).

125. State v. McCord, 538 S.E.2d 633, 649 (N.C. Ct. App. 2000).

126. Williamson, *supra* note 3.

127. *Id.* at 2.

128. *What is Touch DNA?*, SCI. AM. (Aug. 8, 2008), http://www.scientificamerican.com/article/experts-touch-dna-jonbenet-ramsey/.

129. *See id.*

130. *Id.*

131. *Id.*

and processing procedures are highly sensitive.[132] This sensitivity, combined with the high risk of secondary skin cell transfer, results in a greater likelihood of contamination.[133]

2. Touch DNA Evidence in the Courtroom

Courts have been reluctant to accept touch DNA evidence.[134] Prior to the *Carver* decision, North Carolina appellate courts had not even addressed the admissibility of inculpatory touch DNA evidence, much less its sufficiency to establish identity.[135] In one of the few reported decisions to mention inculpatory touch DNA evidence, the Utah Court of Appeals affirmed a conviction based in part on touch DNA evidence.[136] The court gave short shrift to the touch DNA analysis, explaining simply that:

> [The owner of the vehicle] said that the drugs, paraphernalia, and clothes were not in the car at the time she lent it to Defendant. A DNA expert testified that the combined profile from the "touch DNA" found on the bandana matched Defendant, while a randomly selected person would only have a 1 in 9620 chance of matching the combined profile.[137]

The court's brief treatment of the touch DNA evidence was likely due to the "myriad of other evidence against Defendant."[138] Accordingly, it can reasonably be inferred that the court upheld the defendant's conviction only in small part due to the touch DNA evidence and primarily because of the other incriminating evidence.[139]

One of the concerns about the reliability of touch DNA as opportunity evidence concerns the difficulty of determining when an individual deposited the touch DNA sample.[140] For example, the Arkansas Supreme Court observed that discovering touch DNA "at the crime scene and at the victim's home tends to show nothing other than that some unknown third person was present in those

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132. Williamson, *supra* note 3, at 4.
133. *Id.*
134. *See* Kawecki, *supra* note 5, at 829–30.
135. *See* State v. Carver, 725 S.E.2d 902, 909 (N.C. Ct. App. 2012) (Hunter, Jr., J., dissenting), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013).
136. State v. Dick, 280 P.3d 445, 448–49 (Utah Ct. App. 2012).
137. *Id.*
138. *See id.*
139. *See id.*
140. *See, e.g.*, Birts v. State, 2012 Ark. 348, at 8, No. CR 12-74, 2012 WL 4471108, at *8 (Sept. 27, 2012); *Carver*, 725 S.E.2d at 909 (Hunter, Jr., J., dissenting); *see also* Joe Minor, *Touch DNA: From the Crime Scene to the Crime Laboratory*, FORENSIC MAG. (Apr. 12, 2013, 6:27 AM), *available at* http://www.forensicmag.com/articles/2013/04/touch-dna-crime-scene-crime-laboratory (noting that one of the limitations of touch DNA evidence is not knowing whether uninvolved individuals had access to the crime scene or the victim).

two places at some unknown time—it does not directly connect the unknown third person with the commission of any of these three murders."[141] Similarly, the dissent in *Carver* expressed concern over the testimony from the State's touch DNA expert, who explained that "there is no way to tell *when* the defendant's touch DNA sample was left on the vehicle."[142]

When courts have addressed touch DNA evidence, most have done so in the context of post-conviction exculpation proceedings.[143] Although courts seem more amenable to the use of touch DNA for exculpation purposes, the results are still mixed.[144]

Perhaps the most widely known example of touch DNA exculpation occurred in the JonBenét Ramsey case.[145] In that situation, the touch DNA exoneration did not occur in the context of post-conviction, actual innocence proceedings, but instead the touch DNA evidence cleared Ramsey family members as suspects.[146] More than a decade after the 1996 murder of six-year-old JonBenét Ramsey, forensic testing revealed previously undiscovered touch DNA on the victim's clothing belonging to "an unexplained third party."[147] Because investigators found the same touch DNA sample in three different places on the clothing, the prosecutor concluded that the sample belonged to the perpetrator.[148]

III. ANALYSIS

The majority's decision that the touch DNA found on the outside of the victim's vehicle combined with Mr. Carver's denial was sufficient to withstand a motion to dismiss is problematic for at least two reasons. First, the majority's reasoning is legally unsound. Second, the *Carver* decision establishes unwise legal precedent, allowing future courts to deny a defendant's motion to dismiss on tenuous grounds.

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141. *Birts*, 2012 Ark. 348, at 8, 2012 WL 4471108, at *8.

142. *Carver*, 725 S.E.2d at 909 (Hunter, Jr., J., dissenting).

143. *See* Kawecki, *supra* note 6, at 831.

144. *See id.* at 830–33. *Compare* Montez v. State, 86 So. 3d 1243, 1245 (Fla. Dist. Ct. App. 2012) (holding that there was a "reasonable probability that [the defendant] would have been acquitted if the touch DNA evidence had been admitted at trial"), *with* Swearingen v. State, 303 S.W.3d 728, 738 (Tex. Crim. App. 2010) (refusing to allow post-conviction touch DNA testing because of the defendant's "inability to show a 51% probability that he would not have been convicted").

145. *See* Catherine Tsai, *DNA Tests Clear Family in JonBenet's Death*, SFGATE (July 10, 2008, 4:00 AM), http://www.sfgate.com/news/article/DNA-tests-clear-family-in-JonBenet-s-death-3277339.php.

146. *Id.*

147. *Id.*

148. *Id.*

A. The Majority's Reliance on Miller *is Misplaced, and the* Carver *Decision is at Odds with Existing Precedent*

The majority's decision is entirely unsupported by *Miller*.[149] In fact, the majority goes beyond relying on *Miller*, finding that "the rule from *Miller* is perfectly applicable" to the facts of Mr. Carver's case.[150] In *Miller*, the North Carolina Supreme Court upheld the denial of a motion to dismiss for insufficient evidence based on fingerprint evidence linking the defendant to the crime scene.[151] In contrast, the genetic material recovered from the exterior of the victim's vehicle in *Carver* was touch DNA evidence.[152]

As discussed in Subpart I.C., the dissent rightly criticized the majority's proposition of the following equivalence: fingerprint evidence = traditional DNA evidence = touch DNA evidence.[153] Unlike fingerprint evidence, which the North Carolina Supreme Court has accepted as reliable opportunity evidence since 1931,[154] and traditional DNA evidence, which the court has accepted since 1990, touch DNA evidence has not been recognized in a single reported North Carolina decision.[155] Because the accuracy and reliability of touch DNA evidence has not been examined by any North Carolina appellate court, implicit equivalence to fingerprint and traditional DNA evidence is more than inapposite. Stated differently, it simply does not follow that touch DNA is the same type of evidence as fingerprint evidence.[156]

Beyond the misguided analogy to *Miller*'s use of fingerprint evidence, the majority's other supposed analogy to *Miller* also fails. Indeed, unlike the defendant in *Miller* who admitted in open court that he touched the padlock,[157] Mr. Carver vehemently denied (and continues to deny) that he ever touched the vehicle.[158] The majority makes much of the fact that Mr. Carver denied touching the vehicle.[159] According to the majority, Mr. Carver's "denial and the DNA's contradiction thereof, viewed in the light most favorable to the State, was sufficient to establish that the DNA could only have been left at the time the offense was committed."[160] However, this

149. *See* State v. Carver, 725 S.E.2d 902, 908–10 (N.C. Ct. App. 2012) (Hunter, Jr., J., dissenting), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013).
150. *Id.* at 904–05 n.2 (majority opinion).
151. State v. Miller, 220 S.E.2d 572, 575 (N.C. 1975).
152. *See* New Brief for the State at 32, *Carver*, 736 S.E.2d 172 (No. 301A12).
153. *See Carver*, 725 S.E.2d at 909 (Hunter, Jr., J., dissenting).
154. *See* State v. Combs, 158 S.E. 252, 254 (N.C. 1931).
155. *See Carver*, 725 S.E.2d at 909 (Hunter, Jr., J., dissenting).
156. Stephanie Beaugh, Comment, *How the DNA Act Violates the Fourth Amendment Right to Privacy of Mere Arrestees and Pre-Trial Detainees*, 59 LOY. L. REV. 157, 200 (2013).
157. State v. Miller, 220 S.E.2d 572, 573 (N.C. 1975).
158. *Carver*, 725 S.E.2d at 904.
159. *See id.* at 905.
160. *Id.*

only serves to further distinguish the situation in *Carver* from *Miller* because the defendant in *Miller* "stipulated in open court at trial that the thumbprint was his."[161]

Moreover, the majority believed that Mr. Carver "concede[d] in his brief that the DNA evidence established his presence at the crime scene in this case, stating that the only connection between himself and the victim was 'his having touched her car.'"[162] However, Mr. Carver's brief to the North Carolina Court of Appeals does not appear to make such a concession.[163] Indeed, Mr. Carver's brief did not admit that Mr. Carver was at the crime scene when the crime occurred because admitting to touching a mobile object, such as a car, is not the same as admitting to touching a car when it was parked at the crime scene at the time of the victim's death.[164]

All that remains to support the majority's conclusion is the existence of Mr. Carver's touch DNA on the exterior of the vehicle and a statement by Mr. Carver regarding the height of the victim. As the dissent pointed out, the statement concerning the victim's height raises no more than a mere suspicion that Mr. Carver was the perpetrator because, given the extensive media coverage of the case, it was entirely plausible that Mr. Carver had seen a photo of the victim on television.[165] In fact, Mr. Carver's trial counsel noted that Mr. Carver's estimation of the victim's height was wide of the mark.[166] Mr. Carver estimated that the victim, who stood five feet and three inches tall, was less than five feet tall.[167] Consequently, Mr. Carver's erroneous estimation of the victim's height likely

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161. *Miller*, 220 S.E.2d at 573; *see also Carver*, 725 S.E.2d at 904.

162. *Carver*, 725 S.E.2d at 904–05 n.2.

163. *See id.* at 909 (Hunter, Jr., J., dissenting) ("Admitting to having touched the victim's car does not admit presence at the crime scene because cars are mobile objects, often parked in public places and touched, intentionally or not, by countless people throughout a given day."); Defendant-Appellant's New Brief, *supra* note 23, at 13 n.5. *See generally* Defendant-Appellant's Brief, *supra* note 13.

164. *See Carver*, 725 S.E.2d at 909 (Hunter, Jr. J., dissenting); Defendant-Appellant's New Brief, *supra* note 23, at 13 n.5. *See generally* Defendant-Appellant's Brief, *supra* note 13.

165. State v. Butler, 567 S.E.2d 137, 139–40 (N.C. 2002) (citing State v. Wilson, 556 S.E.2d 272, 290 (N.C. 2001)) ("For purposes of a motion to dismiss, evidence is deemed less than substantial if it raises no more than mere suspicion or conjecture as to the defendant's guilt."); *Carver*, 725 S.E.2d at 909–10 (Hunter, Jr., J., dissenting). Although the State contends in its brief that there was "[n]o news footage depicting Ms. Yarmolenko [that would] establish[] her height relative to" Mr. Carver, Brief for the State at 9–10, *Carver*, 725 S.E.2d 902 (No. COA11-1382), the dissent in *Carver* noted that there was testimony that the case was televised. *Carver*, 725 S.E.2d at 909–10 (Hunter, Jr., J., dissenting).

166. *See Dateline on ID – Mystery on the Catawba River*, *supra* note 32. Beginning at time 38:53, the episode details Carver's erroneous estimation of the victim's height.

167. *See id.*

constituted less, and certainly not more, than a "mere suspicion" of his guilt.[168]

The remaining evidence that could have potentially survived a motion to dismiss was the touch DNA evidence on the exterior of the vehicle. However, this evidence is not substantial evidence of Mr. Carver's opportunity to commit the charged crime.[169] Given the alternative possibility that the DNA was innocently transferred at a time when no crime was being committed, the evidence does no more than raise a mere "suspicion or conjecture" of Mr. Carver's guilt.[170] Furthermore, because the touch DNA on the objects used to strangle the victim did not contain Mr. Carver's DNA, the evidence, even "taken in the strongest view adverse" to Mr. Carver, "'is far from excluding the rational conclusion that some other unknown person may be the guilty party.'"[171]

Lastly, even accepting the flawed premise that touch DNA evidence is equivalent to fingerprint evidence, *Miller* does not control the situation in *Carver*. Two years after *Miller*, the North Carolina Supreme Court clarified its holding regarding the sufficiency of fingerprint evidence: "Fingerprint evidence, standing alone, is sufficient to withstand a motion for nonsuit only if there is '*substantial* evidence of circumstances from which the jury can find that the fingerprints could only have been impressed at the time the crime was committed.'"[172] Evidently, the North Carolina Supreme Court was still concerned about relying exclusively on fingerprint evidence as sufficient opportunity evidence.[173]

Accordingly, to withstand a motion to dismiss, fingerprint evidence must be accompanied by either (1) "[c]ircumstances tending to show that a fingerprint lifted at the crime scene could only have been impressed at the time the crime was committed" or (2) "other circumstances tend[ing] to show that defendant was the criminal actor."[174] In *Irick*, the "other circumstances" included observations by a police officer of the defendant leaving the scene of the crime shortly after commission of the crime, evidence in the defendant's pockets that matched stolen items from the crime scene, and attempts by the defendant to flee from the police officer.[175]

No such "other circumstances" were present in *Carver*. Neither was there sufficient evidence that Mr. Carver's touch DNA could have been impressed only at the time the crime was committed,

168. *See Carver*, 725 S.E.2d at 909–10 (Hunter, Jr., J., dissenting).
169. *See id.*
170. *See* State v. Malloy, 305 S.E.2d 718, 720 (N.C. 1983).
171. State v. Lee, 240 S.E.2d 449, 451 (N.C. 1978) (quoting State v. Goodson, 12 S.E. 329, 329 (N.C. 1890)).
172. State v. Irick, 231 S.E.2d 833, 841 (N.C. 1977) (quoting State v. Miller, 220 S.E.2d 572, 574 (N.C. 1975)).
173. *See id.*
174. *See id.*
175. *Id.* at 841–42.

because Mr. Carver's "touch DNA was matched only to the outside of the victim's vehicle and only in one place . . . ."[176] It does not follow that Mr. Carver must have touched the exterior of the victim's vehicle *only* at the time of the crime and was thus complicit in the murder.[177] Furthermore, the coroner testifying for the State admitted that he could not determine the victim's time of death.[178] Without knowing when the victim died, it would be "unreasonable for a juror to infer the victim could have died only during the time" in which Mr. Carver was fishing nearby.[179] In fact, "[s]uch an inference 'is far too tenuous to be considered as substantial proof of anything.'"[180] Consequently, the majority's decision in *Carver* is legally unsound and stands at odds with existing North Carolina precedent.

B. The Majority's Decision in Carver *Establishes Unwise Criminal Law Jurisprudence in North Carolina*

The majority's decision that Mr. Carver's touch DNA on the outside of the victim's vehicle—combined with his denial that he ever touched the car—was sufficient to withstand a motion to dismiss, sets unwise precedent in North Carolina. The North Carolina Supreme Court's apparent endorsement of this touch DNA decision has the potential to foreclose a jurisprudential device, the motion to dismiss, that is supposed to protect a criminal defendant from the risk of an unreasonable jury verdict when the State cannot present substantial evidence of the defendant's guilt.[181] Moreover, the brevity of the majority's discussion of touch DNA evidence is extraordinary given that the issue was one of first impression.[182]

The majority in *Carver* simply equated touch DNA with fingerprint evidence and traditional DNA evidence without actually addressing any of the scientific or reliability concerns that accompany touch DNA evidence.[183] Likewise, notably absent from the State's brief to the North Carolina Court of Appeals was any mention of touch DNA.[184] Instead, in that brief, the State characterized Mr. Carver's DNA as simply "DNA," implying, as did the majority, that touch DNA evidence possesses the same indicia of reliability as traditional DNA evidence.[185] It was not until its brief

176. State v. Carver, 725 S.E.2d 903, 909 (N.C. Ct. App. 2012) (Hunter, Jr., J., dissenting), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013).
177. *See id.*
178. *Id.* at 908.
179. *Id.*
180. *Id.* at 909 (quoting State v. Bell, 309 S.E.2d 464, 469 (N.C. Ct. App. 1983)).
181. *See* N.C. GEN. STAT. § 15-173 (2013).
182. *See Carver*, 725 S.E.2d at 903–05.
183. *See id.*
184. *See generally* Brief for the State, *supra* note 165.
185. *See id.* at 15–19.

to the North Carolina Supreme Court that the State addressed touch DNA evidence.[186]

Given that the North Carolina Supreme Court affirmed the majority's decision in *Carver* per curiam with no opinion of its own, it stands to reason that the court was at least marginally persuaded by the majority opinion from the North Carolina Court of Appeals and the brief submitted by the State. The State contended that the dissent's characterization of touch DNA was not supported by the record.[187] The only support provided for the State's assertion was discussion of touch DNA testimony from two forensic scientists who worked for the State Bureau of Investigation ("SBI").[188]

However, the State admitted in its brief that these forensic scientists testified about issues concerning the recovery of "enough of an identifiable sample, *not the accuracy of the testing technique*."[189] Thus, even by the State's own admission, the reliability and accuracy of touch DNA were not sufficiently established for the North Carolina Court of Appeals to rest its holding on this type of evidence.[190] Additionally, a major problem with touch DNA evidence is that it is more susceptible than traditional DNA evidence to being deposited by innocent means.[191] For example, an individual is less likely to innocently deposit traditional DNA evidence (blood, semen, and saliva) due to the sources of this type of DNA evidence. In contrast, touch DNA evidence is subject to the risk of secondary transfer and the risk that an individual's skin cells were deposited innocently at a different time.[192] Given the unique evidentiary and scientific problems posed

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186. *See* New Brief for the State, *supra* note 152, at 30–32.

187. *Id.* at 30.

188. *Id.* at 30–32. In contrast with the field of academic genetics, in forensic science, "96% of positions are held by persons with bachelor's degrees (or less), 3% master's degrees, and 1% Ph.D.s . . . . When individuals who are not steeped in the culture of science work in an adversarial, crime-fighting culture, there is a substantial risk that a different set of norms will prevail." Michael J. Saks & Jonathan J. Koehler, *The Coming Paradigm Shift in Forensic Identification Science*, 309 SCI. 892, 893 (2005).

189. New Brief for the State, *supra* note 152 (emphasis added).

190. *See id.*

191. *See* Kawecki, *supra* note 5, at 828, 828 n.55; Mike Silvestri, Comment, *Naturally Shed DNA: The Fourth Amendment Implications in the Trail of Intimate Information We All Cannot Help but Leave Behind*, 41 U. BALT. L. REV. 165, 180–81 (2011) ("A person can do nothing . . . to avoid leaving naturally shed DNA. No voluntariness or intention is required. A person's clothing could rub against his skin, or someone else could bump into the person to slough off that person's skin cells, even without any movement at all. People shed between 30,000 and 40,000 skin cells every minute."); *see also* James Morgan, *DNA Profiling in North Carolina*, 21 N.C. CENT. L.J. 300, 316 (1995) (noting that traditional DNA evidence is often found at the scene of the crime in rape and murder cases).

192. *See* State v. Carver, 725 S.E.2d 902, 909 (N.C. Ct. App. 2012) (Hunter, Jr., J., dissenting), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013).

by touch DNA evidence, the expert testimony regarding touch DNA that the majority in *Carver* relied on should not be sufficient to sustain as substantial evidence the use of a novel scientific technique.

In addition, the majority's discussion of the touch DNA issue paled in comparison to North Carolina appellate courts' treatment of fingerprint and traditional DNA evidence.[193] Before the North Carolina Supreme Court articulated the rule on the sufficiency of fingerprint evidence, it cited as authority ten cases that discussed and reviewed fingerprint evidence.[194] These cases support the *Miller* court's conclusion concerning the use of fingerprint evidence as evidence of identity and opportunity.[195] Similarly, when the North Carolina Supreme Court considered traditional DNA evidence for the first time, it conducted a thorough review of DNA testing.[196] The *Pennington* court relied on testimony by Dr. George Herrin, a specialist in the field of molecular biology, which is defined as the study of DNA.[197] Dr. Herrin, who held a PhD in biochemistry, had published multiple articles in molecular biology journals, conducted more than one hundred DNA profile tests, and supervised many more DNA tests.[198] Furthermore, the court noted that many "appellate courts in other jurisdictions ha[d] reached the same conclusion and result" on the reliability of DNA testing.[199]

In contrast, the majority in *Carver* implicitly relied on expert testimony from two North Carolina SBI analysts.[200] No discussion of the qualifications of these analysts ensued.[201] Additionally, unlike in *Pennington* where the North Carolina Supreme Court cited ample judicial precedent concerning traditional DNA evidence, the majority in *Carver* did not cite any other sources, academic or

193. *See, e.g.*, State v. Pennington, 393 S.E.2d 847, 853 (N.C. 1990); State v. Miller, 220 S.E.2d 572, 574 (N.C. 1975).

194. *See Miller*, 220 S.E.2d at 574.

195. *See, e.g.*, State v. Jackson, 200 S.E.2d 626, 635 (N.C. 1973); State v. Foster, 192 S.E.2d 320, 326–27 (N.C. 1972); State v. Smith, 161 S.E.2d 449, 452–53 (N.C. 1968); State v. Tew, 68 S.E.2d 291, 294–95 (N.C. 1951); State v. Rogers, 64 S.E.2d 572, 577–79 (N.C. 1951), *overruled on other grounds by* State v. Silver, 213 S.E.2d 247, 253 (N.C. 1975); State v. Reid, 53 S.E.2d 849, 853 (N.C. 1949); State v. Minton, 46 S.E.2d 296, 298 (N.C. 1948); State v. Helms, 12 S.E.2d 243, 245 (N.C. 1940); State v. Huffman, 182 S.E. 705, 707 (N.C. 1935); State v. Combs, 158 S.E. 252, 254 (N.C. 1931).

196. *Pennington*, 393 S.E.2d at 853.

197. *Id.* at 853–54.

198. *Id.* at 854.

199. *Id.*

200. *See* State v. Carver, 725 S.E.2d 902, 904 n.1 (N.C. Ct. App. 2012), *aff'd per curiam*, 736 S.E.2d 172 (N.C. 2013); *see also* New Brief for the State, *supra* note 152, at 30–32.

201. *See Carver*, 725 S.E.2d at 904–05.

judicial, concerning touch DNA evidence.[202] Instead, the majority relied principally on a case involving *fingerprint* evidence.[203]

The majority's decision in *Carver* sets the precedential stage for courts in North Carolina to deny a defendant's motion to dismiss even if the only evidence of the defendant's opportunity is touch DNA evidence. Therefore, the true import of the majority's holding is that it opens the door for future courts to rely on this decision, as opposed to scientific and forensic experts, when deciding important questions regarding touch DNA evidence.[204]

C. North Carolina Should Limit Touch DNA Evidence to Exculpation Purposes

The use of touch DNA evidence for exculpation purposes is another question altogether. This variant of the touch DNA issue would also be one of first impression in North Carolina. Because of the abundance of touch DNA and the extreme sensitivity of touch DNA testing, this type of evidence lends itself to exculpatory, rather than inculpatory, forensic purposes. Indeed, human beings are constantly shedding skin cells and depositing touch DNA on most objects that they touch.[205] Therefore, at least in the context of a homicide case, it is very likely that a perpetrator will deposit skin cells on the victim, the victim's clothes, the murder weapon, etc. That the North Carolina Supreme Court should overturn *Carver* on the issue of inculpatory touch DNA evidence should not prevent the court, if and when the issue is presented, to hold that touch DNA evidence is admissible to establish a defendant's actual innocence.

As an example of how touch DNA evidence can be used to exonerate a defendant, suppose a victim dies as a result of strangulation and a defendant is charged with murder. If the defendant was in fact present at the crime scene when the victim died, then almost certainly at least some of the touch DNA recovered from the victim's clothes or from the objects used to strangle the victim should match the defendant.[206] If it does not, and instead the touch DNA matches an unidentified individual, then the touch DNA

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202. *See id.* at 903–06; *id.* at 908–09 (Hunter, Jr., J., dissenting); discussion *supra* Subpart III.A.

203. *See Carver*, 725 S.E.2d at 904–05.

204. Although fingerprint evidence overcame initial reliance on solely judicial acceptance and eventually received ample scientific support, this is not how the judicial system is supposed to operate. *See supra* notes 81–90 and accompanying text; discussion *supra* Subpart II.B. Judges are experts on the law, not science, and moreover there is no guarantee that touch DNA evidence will ever attain the necessary indicia of reliability to independently sustain a motion to dismiss.

205. Williamson, *supra* note 3.

206. *See id.*

evidence can be used to exonerate the defendant.[207] In a strange twist of fate, Mr. Carver may one day be exonerated by the same type of evidence currently responsible for his incarceration—the touch DNA evidence recovered from the three items used to strangle the victim.

CONCLUSION

The North Carolina Supreme Court should overturn *Carver* to the extent that it stands for the proposition that inculpatory touch DNA evidence alone is sufficient to withstand a motion to dismiss. Touch DNA presents new problems that have not received adequate treatment from North Carolina courts. As the first court to address the sufficiency of touch DNA evidence, the majority in *Carver* charts a risky jurisprudential course for North Carolina. The majority's decision paves the way for trial courts to deny a criminal defendant's motion to dismiss for insufficient evidence even if the only evidence pointing to the identity or opportunity of the defendant is touch DNA found in the vicinity of the crime scene. With a simple citation to *Carver*, a trial court can let the case proceed to the jury, and an appellate court can uphold the denial of the motion to dismiss.

Accordingly, the North Carolina Supreme Court should take up the issue of the sufficiency of touch DNA evidence in a future case and circumscribe *Carver*.[208] As the law currently stands; post-*Carver*, a criminal defendant cannot prevail on his motion to dismiss even when the only evidence, circumstantial or otherwise, that links the defendant to the crime scene is touch DNA. Ideally, the court would first address the threshold issue of admissibility of touch DNA evidence. Even if touch DNA evidence is deemed admissible, sufficiency to withstand a motion to dismiss presents an entirely different question.

The problem with the majority's decision in *Carver* is that the touch DNA evidence was the only brick in the wall.[209] When the

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207. Family members were cleared as suspects in the JonBenét Ramsey case in precisely this manner. *See* discussion *supra* Subpart II.D.2.

208. The real tragedy in this case concerns the fate of Mr. Carver. Because of the majority's decision and the Supreme Court's affirmance, Mr. Carver is stuck with his sentence of life in prison without the possibility of parole for a crime that many believe he did not commit. *See Ira Yarmolenko*, GENERATION WHY PODCAST (Jan. 13, 2014, 9:40 PM), http://raasnio.com/GenerationWhy Podcast/ira-yarmolenko/. According to the *Generation Why Podcast*, the North Carolina Center on Actual Innocence accepted Mr. Carver's case for review in June 2013. *Id.*; *see also* Elizabeth Leland, *N.C. Group Investigates Claim in Death of UNCC Student Irina Yarmolenko*, CHARLOTTE OBSERVER (Sept. 24, 2014), http://www.charlotteobserver.com/2014/09/28/5206202/nc-center-on-actual-innocence.html#.VDqm_kt8T0A (confirming that the North Carolina Center on Actual Innocence is investigating Mr. Carver's conviction).

209. *See* CHARLES T. MCCORMICK, MCCORMICK ON EVIDENCE § 185 (John W. Strong ed., 4th ed. 1992) ("A brick is not a wall.").

only brick in the wall of evidence is the defendant's touch DNA in the vicinity of the crime scene, the court should dismiss the case, especially given that "evidence . . . of opportunity alone is insufficient to carry a case to a jury."[210] Moreover, neither the majority nor any other North Carolina court has considered the accuracy and reliability of inculpatory touch DNA evidence.

Lastly, North Carolina's highest court should conduct a thorough review of touch DNA evidence, as it did with fingerprint evidence in 1975[211] and traditional DNA evidence in 1990,[212] before establishing the sweeping precedent that it endorsed by affirming the *Carver* decision. Consequently, the North Carolina Supreme Court should overrule *Carver* to the extent that it stands for the proposition that touch DNA alone constitutes sufficient opportunity evidence to withstand a defendant's motion to dismiss.

*Davis Phillips**

210. *See* State v. Hayden, 711 S.E.2d 492, 495 (N.C. Ct. App. 2011) (quoting State v. Bell, 309 S.E.2d 464, 467 (N.C. Ct. App. 1983)).

211. State v. Miller, 220 S.E.2d 572, 574 (N.C. 1975).

212. State v. Pennington, 393 S.E.2d 847, 853 (N.C. 1990).

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