

**THE STATE OF SOUTH CAROLINA
In The Supreme Court**

The State, Respondent,

v.

Billy Phillips, Petitioner.

Appellate Case No. 2018-000977

ON WRIT OF CERTIORARI TO THE COURT OF APPEALS

Appeal from Jasper County
Michael G. Nettles, Circuit Court Judge

Opinion No. 27978
Heard October 16, 2019 – Filed June 3, 2020

REVERSED

Deputy Chief Appellate Defender Wanda H. Carter, of
Columbia, for Petitioner.

Attorney General Alan McCrory Wilson and Deputy
Attorney General Donald J. Zelenka, of Columbia;
Solicitor Isaac McDuffie Stone, III, of Bluffton, all for
Respondent.

JUSTICE FEW: Billy Phillips was convicted of murder and possession of a weapon during the commission of a violent crime. At trial, a DNA analyst testified Phillips could not be excluded as a contributor to a mixture of DNA recovered from two samples taken from the crime scene. The analyst conceded, however, the statistical probability that some other randomly selected and unrelated person also could not be excluded as the person who left the DNA was—for one of the samples—only one in two. In addition, the State failed to explain to the trial court or the jury three fundamental concepts underlying the DNA testimony the analyst gave in this particular case. Finally—in several instances—the State presented information to the trial court and the jury that was simply wrong. We hold the trial court erred in not sustaining Phillips' objections to this testimony. We reverse and remand for a new trial.

I. Facts and Procedural History

Darius Woods was a well-known drug dealer in Ridgeland, South Carolina. His customers knew him to carry large amounts of cash. On the night of May 18, 2013, two of Woods' customers—Shontay McKeithan and Davonte Freeman—found him dead in his house. He was lying on his back with his hands above his head. Someone shot him twice with his own .38 caliber revolver, once in the neck and once in the head. The shot to the head was a contact wound, meaning the muzzle of the pistol was in contact with Woods' skin when the pistol was fired. Law enforcement officers found the pistol on Woods' stomach. His jeans pockets had been pulled out as though the killer had stolen his money.

At the January 2016 trial, McKeithan testified she arrived at Woods' house around 10:30 p.m. to purchase marijuana. She remained in her car while she called Woods' cell phone, but Woods never answered. As she waited for Woods to answer, her cousin Davonte Freeman arrived to purchase marijuana from Woods. She and Freeman called Woods' cell phone again and could hear it ringing inside, but Woods did not answer. Freeman then went inside for what McKeithan described as "five to seven minutes." McKeithan testified she did not hear any gunshots. When Freeman came back outside, he was holding a gun and screaming that Woods was dead. She testified he went back inside, and later told her he put the gun where he found it.

Freeman testified he arrived at Woods' house to buy marijuana and saw McKeithan in her car. He knocked on Woods' door but no one answered, so he went in the house and found Woods dead on the floor. Woods' gun was on his stomach, and his jeans

pockets were pulled out. Freeman testified he panicked. He picked up the gun, smelled it to determine if it had been fired, and immediately put the gun back on Woods' stomach. He testified he was inside less than a minute before he went outside to tell McKeithan Woods was dead. He denied he ever took the gun outside.

Several witnesses testified they saw Phillips in the general vicinity of Woods' house within an hour or so before Freeman found the body. Donte Jenkins testified he, Woods, and Phillips were hanging out at Woods' house on the evening of the murder. Jenkins left Woods and Phillips alone at Woods' house at approximately 9:15 p.m. Taylor Cowherd testified she saw Phillips on Woods' porch between 9:25 and 9:31 p.m. Wrenshad Anderson—Freeman's brother—testified he saw Phillips walking to a nearby BP gas station at approximately 9:40 p.m. Reginald Green testified Phillips called Green shortly after 10:00 p.m. to ask Green to come pick him up. Green testified he picked up Phillips at Phillips' brother's house and then drove to the BP station where Phillips went inside to purchase cigars and beer for himself, and \$5 worth of gas for Green. Phillips hung out with Green for a few hours until Green dropped Phillips off at a house in the same neighborhood as Woods' house. Each of these witnesses testified to circumstances—in addition to seeing Phillips near Woods' house—that supported the State's claim that Phillips killed Woods.

In the early hours of the morning after the murder, a Ridgeland Police Department officer approached Phillips on the street and asked him to come to the police department to speak with officers about Woods' murder. Two South Carolina Law Enforcement Division (SLED) agents interviewed Phillips around 3:00 a.m. The State played a video of this interview for the jury. In the interview, Phillips denied shooting Woods. Phillips said he visited Woods several times the day of the murder, and during these visits, he and Woods smoked marijuana and drank alcohol. Phillips explained he held and pointed Woods' gun to imitate law enforcement officers. Phillips claimed Woods was alive when Phillips left between 9:30 and 10:00 p.m., and he denied being present at the time Woods was murdered. After the interview, an investigator collected a DNA sample from Phillips.

Six days later, SLED conducted a second interview in which Phillips gave a different account of what happened. The agent who conducted this interview testified to some of the things Phillips said, but the State did not play the video of it for the jury. The agent testified Phillips told him he was sitting in Woods' car when three men approached Woods' house. One of the men entered the house while the other two men remained on the porch. Phillips heard gunshots, and as the three men were

leaving, they made eye contact with Phillips. One of the men called Phillips by his nickname, "Dee." Phillips told the agent that because he was in fear of his life, he got out of the car and ran to his mother's house. The route there required him to pass the BP station. Phillips told the agent he gave a different story during his first interview because he was afraid something would happen to him or his family.

During the State's investigation, SLED collected DNA "standards" from six people in addition to Phillips. They were Freeman, McKeithan, three officers, and another person later determined not to be involved. SLED forensic analyst Lilly Gallman compared the DNA standards to "touch DNA"¹ samples collected from the scene of the crime and during Woods' autopsy. Of the touch DNA samples Gallman analyzed, she excluded Phillips as a contributor to all of the samples except two. The first sample—already mentioned—came from Woods' right front jeans pocket. The second was taken from the grip of Woods' gun.

In a written pre-trial motion, Phillips objected to the admissibility of Gallman's DNA testimony. The trial court conducted a hearing on the motion before trial, but did not take testimony. The court ruled Gallman's testimony was admissible. Phillips renewed his objections when Gallman testified during trial. The jury convicted Phillips of murder and possession of a weapon during the commission of a violent crime. The trial court sentenced Phillips to concurrent prison terms of forty years for murder and five years for the weapon charge. The court of appeals affirmed. *State v. Phillips*, Op. No. 2018-UP-081 (S.C. Ct. App. filed Feb. 14, 2018). We granted Phillips' petition for a writ of certiorari.

II. Admission of DNA Expert Testimony

In *State v. Council*, 335 S.C. 1, 515 S.E.2d 508 (1999)—this Court's first opportunity to study the admissibility of expert opinion on DNA evidence under our new Rules of Evidence—we upheld the trial court's decision to admit DNA evidence that (1) implicated the defendant in a heinous murder and sexual assault and (2) exonerated the person the defendant blamed for the crimes. 335 S.C. at 17, 515 S.E.2d at 516. Our focus in *Council* was on the scientific methodology used by the FBI expert to

¹ "Touch DNA" is one of the three fundamental concepts we mentioned in the introduction to this opinion. As we will explain in detail in Section II.C.—in which we address all three concepts—touch DNA is taken from skin or other cells left on a surface after it was touched.

analyze the DNA evidence. Concluding that the expert's method—mitochondrial DNA analysis of pubic hair found at the crime scene—was sufficiently reliable, we set forth what has become the standard South Carolina formulation of the elements of the foundation for scientific evidence under Rule 702. "When admitting scientific evidence under Rule 702," we held, "the trial judge must find the evidence will assist the trier of fact, the expert witness is qualified, and the underlying science is reliable." 335 S.C. at 20, 515 S.E.2d at 518. We also held that—"if the evidence is admissible under Rule 702"—the trial court must determine whether the probative value is substantially outweighed by the dangers listed in Rule 403. *Id.*

The "assist the trier of fact" element of the Rule 702 foundation was not specifically litigated in *Council*, nor was Rule 403. In particular, because the expert testified the DNA evidence established the other person "could not have been the donor" of the pubic hair, 335 S.C. at 17, 515 S.E.2d at 516, and "most probably the hair . . . belonged to [the defendant]," 335 S.C. at 18-19, 515 S.E.2d at 517, there could not have been any doubt the evidence would "assist the trier of fact." Presumably for the same reasons, the defendant did not challenge the probative value.

In this case, however, Gallman testified the statistical probability that another person—not Phillips—could have been the contributor to the touch DNA sample taken from the gun was one in two hundred, and the probability another person was the contributor to the jeans pocket sample was one in two. Phillips argues these probabilities substantially undermine the probative value of Gallman's testimony, which in turn raises the question of whether Gallman's testimony satisfied the "assist the trier of fact" element. Phillips also argues Gallman's testimony was unfairly prejudicial, confusing, and likely to mislead the jury, and these dangers substantially outweighed the low probative value of her testimony under Rule 403.

A. Gallman's Testimony

Gallman analyzed at least thirteen touch DNA samples collected in connection with Woods' murder: two samples from the grip of the gun; eight samples from Woods' blue jeans; and three other samples from socks and a piece of jewelry found at the crime scene. Two of the thirteen samples could not be reliably tested. Of the eleven remaining touch DNA samples, Gallman compared each one to the standards from the seven people who submitted DNA for testing. She concluded Phillips' DNA was not present in nine of the samples. In the words Gallman used to describe this

conclusion to the jury, she "excluded" Phillips as a contributor to the DNA in each of these nine samples.

As to the other two samples—one from the gun and one from inside Woods' jeans pocket—Gallman testified each contained a mixture of DNA from at least three people. She testified Woods and Phillips "cannot be excluded as contributors" to the mixtures in either sample. The other people who submitted standards for testing—including Freeman—were excluded, except that one of the officers could not be excluded as a contributor to the sample from the gun.

Gallman testified DNA experts "are required" to determine the probability of an error in matching the suspect to a particular DNA sample.² Gallman then explained the likelihood it was another person who left his DNA on the gun or in the jeans pocket. As to the sample from the gun, she testified "the probability of randomly selecting an unrelated individual who could have contributed to this mixture is approximately one in two hundred." As to the jeans, she testified the probability was "one in two." Gallman did not explain how she calculated the probabilities.

B. Probative Value

The primary basis for Phillips' objection to Gallman's testimony was Rule 403. We begin our analysis of a Rule 403 objection with probative value. To understand the probative value of any evidence, we must consider what was practically in dispute at trial. *State v. Gray*, 408 S.C. 601, 610, 759 S.E.2d 160, 165 (Ct. App. 2014). Woods was clearly murdered; the only significant issue—as a practical matter—was who murdered him. We must then consider how important the challenged evidence is to resolving the practically disputed questions. *See State v. James*, 355 S.C. 25, 35, 583 S.E.2d 745, 750 (2003) (stating "the probative worth of any particular bit of

² Gallman testified, "We are required to tell you how often you would see this mixture in a population." Academic sources are more precise. *See, e.g.*, National Research Council, *DNA TECHNOLOGY IN FORENSIC SCIENCE* 9 (1992) ("Interpreting a DNA typing analysis requires a valid scientific method for estimating the probability that a random person by chance matches the forensic sample at the sites of DNA variation examined. To say that two patterns match, without providing any scientifically valid estimate . . . of the frequency with which such matches might occur by chance, is meaningless.").

evidence is obviously affected by the scarcity or abundance of other evidence on the same point" (quoting *Old Chief v. United States*, 519 U.S. 172, 185, 117 S. Ct. 644, 652, 136 L. Ed. 2d 574, 590 (1997)); *Gray*, 408 S.C. at 610, 759 S.E.2d at 165.

In most murder cases, who touched the murder weapon would be extremely important to the question of who committed the murder. In this case, however, Phillips admitted he spent several hours at Woods' house that day, and he held Woods' gun to imitate law enforcement officers. Phillips' own admissions placed him at the scene of the crime, holding the gun. Thus, the probative value of Gallman's testimony connecting Phillips to the DNA on the gun is minimal.

Evidence that Phillips had his hand in Woods' pocket, on the other hand, could have far more probative value. The State's theory of the case was that Phillips was mad at Woods for tricking him out of a PlayStation, and Phillips murdered and robbed Woods in retaliation, knowing Woods carried a lot of cash. DNA evidence placing Phillips' hand inside Woods' jeans pocket—where he presumably kept his cash—would be pivotal to the State's ability to convince the jury its theory was correct, and thus prove the primary disputed fact: who murdered Woods. Contrary to the evidence Phillips handled Woods' gun, there is no known "innocent" reason for Phillips to have his hand in Woods' pocket. At first glance, therefore, the probative value of the evidence appears high.

This brings us to the heart of Phillips' objection. While evidence Phillips had his hand in Woods' pocket could be important to the State in proving its theory of the case, Gallman did not testify the DNA evidence showed Phillips had his hand in Woods' pocket. Rather, Gallman testified her analysis of the touch DNA sample from Woods' pocket revealed a mixture of DNA from at least three people. Importantly, Gallman did not testify Phillips was one of those people. In her words, "Phillips cannot be excluded as [a] contributor[] to this mixture." She testified that one in two people—half of the population—could have been the person who left the DNA in Woods' pocket. In other words, even if Gallman's testimony were clear and readily understood, the best she could do with her DNA analysis was to narrow the identity of the person who had his hand in Woods' pocket—the murderer according to the State's theory—to half of the population. The probative value of Gallman's testimony connecting Phillips to the DNA in Woods' jeans pocket is minimal.

C. Unfair Prejudice, Confusion, Misleading the Jury

The minimal probative value of Gallman's testimony must be balanced against "the danger of unfair prejudice, confusion of the issues, or misleading the jury." Rule 403, SCRE. Phillips argues all three are applicable here.

Most of our Rule 403 cases involve only unfair prejudice. Unfair prejudice is the tendency of the evidence to suggest a decision based on something other than the legitimate probative force of the evidence. *Gray*, 408 S.C. at 616, 759 S.E.2d at 168. Phillips argues Gallman's DNA testimony was unfairly prejudicial because it confused and misled the jury. However, Phillips offers no legal authority to support his argument that confusion of issues or misleading the jury can itself be unfair prejudice.³ We believe the danger of unfair prejudice is a separate analysis from the danger of confusion of the issues or misleading the jury.

We turn, therefore, to the danger that Gallman's testimony would confuse the issues or mislead the jury. DNA evidence is well known as a powerful and accurate evidentiary tool for the State to solve crimes and obtain convictions. Nevertheless, DNA evidence has also come to be known for its potential to confuse and mislead jurors. This potential has been widely discussed by courts and in academic writing. In *United States v. Bonds*, 12 F.3d 540 (6th Cir. 1993), for example, the Sixth Circuit recognized, "The aura of reliability surrounding DNA evidence does present the prospect of a decision based on the perceived infallibility of such evidence" 12 F.3d at 567-68. More recently, the New York Court of Appeals recognized, "The persuasiveness of DNA evidence is so great that as one commentator noted, 'when DNA evidence is introduced against an accused at trial, the prosecutor's case can take on an aura of invincibility.'" *People v. Wright*, 37 N.E.3d 1127, 1137 (N.Y. 2015) (quoting Robert Aronson & Jacqueline McMurtrie, *The Use and Misuse of High-Tech Evidence by Prosecutors: Ethical and Evidentiary Issues*, 76 *Fordham L. Rev.* 1453, 1469 (2007)). The *Wright* court also stated "the potential danger posed to defendant when DNA evidence is presented as dispositive of guilt is by now obvious." *Id.* The Maryland Court of Appeals wrote "jurors place a great deal of

³ *But see* 29 Am. Jur. 2d *Evidence* § 326 (2019) ("Unfair prejudice may arise from evidence that . . . confuses or misleads the trier of fact" (citing *State v. Franks*, 335 P.3d 725, 729 (Mont. 2014))).

trust in the accuracy and reliability of DNA evidence. But this evidence has the potential to be highly technical and confusing in a way that could unduly affect the outcome of a trial." *Whack v. State*, 73 A.3d 186, 188 (Md. 2013).⁴

In most cases, the risk of confusing or misleading the jury with DNA evidence is low because—in most cases—the DNA evidence is straightforward and reliable, and its legitimate probative force is highly persuasive—if not dispositive—of guilt. In *Council*, for example, the DNA expert performed mitochondrial DNA analysis on pubic hair found at the crime scene. He testified the hair "most probably" belonged to the defendant, and the hair certainly did not belong to the person the defendant blamed. 335 S.C. at 18-19, 515 S.E.2d at 517. As long as the jury believed the

⁴ In 2008, the American Psychological Association published an article summarizing the results of three studies concerning the impact of DNA evidence on jurors. Joel D. Lieberman et al., *Gold Versus Platinum: Do Jurors Recognize the Superiority and Limitations of DNA Evidence Compared to Other Types of Forensic Evidence?*, 14 Psychol. Pub. Pol'y & L. 27 (2008). Researchers found, "Public jurors, on average, rated DNA evidence as 95% accurate, and it was rated as 94% persuasive of a suspect's guilt." *Id.* at 52-53. Researchers also found DNA evidence was viewed by the public as more accurate than other evidence, including eyewitness testimony and suspect confessions. *Id.* at 37. The article warned, "The strong and largely invariant impact of DNA evidence across experimental conditions suggests that this type of scientific evidence may be so persuasive that its mere introduction in a criminal case is sufficient to seriously impede defense challenges." *Id.* at 58; *see also State v. Pappas*, 776 A.2d 1091, 1113 (Conn. 2001) (noting the concern "jurors will overvalue DNA evidence and ignore other types of evidence" (citing National Research Council, *THE EVALUATION OF FORENSIC DNA EVIDENCE* 196-97 (1996); Jason Schklar & Shari Seidman Diamond, *Juror Reactions to DNA Evidence: Errors and Expectancies*, 23 Law & Hum. Behav. 159 (1999)); *Commonwealth v. Curnin*, 565 N.E.2d 440, 441 (Mass. 1991) (stating DNA evidence has "an aura of infallibility"); Erin Murphy, *The New Forensics: Criminal Justice, False Certainty, and the Second Generation of Scientific Evidence*, 95 Cal. L. Rev. 721, 769 (2007) (discussing the "air of 'mystic infallibility'" surrounding DNA evidence in a courtroom); Tom R. Tyler, *Viewing CSI and the Threshold of Guilt: Managing Truth and Justice in Reality and Fiction*, 115 Yale L.J. 1050, 1068-73 (2006) (hypothesizing juror overbelief in scientific evidence by affording more probative value than deserved).

expert's testimony, there was no confusion over what it meant, and there was no danger the jury would be misled. Similarly, in *State v. Ramsey*, 345 S.C. 607, 550 S.E.2d 294 (2001), the DNA expert testified his testing showed the victim's blood on the defendant's boot, and "the chance the DNA on the boot did not come from [the victim] was one in 4,601—a percentage greater than 99.9." 345 S.C. at 611, 550 S.E.2d at 296. As in *Council*, if the jury believed the expert, the defendant's guilt followed logically from the expert's testimony.

In this case, however, Gallman's testimony—unlike the straightforward DNA evidence from hair or bodily fluids in *Council* or *Ramsey*—involved three fundamental concepts that are not at all straightforward: "touch DNA," "non-exclusion DNA," and "random match probability." Though these DNA concepts carry with them the same aura of reliability or invincibility, as we will explain, each of them has significant potential to confuse and mislead that was not a factor in the DNA evidence we addressed in *Council* or *Ramsey*.

"Touch DNA" developed from advances in DNA technology that now permit analysts to obtain fragments of DNA profiles from skin or other cells collected from surfaces at crime scenes. One very important thing to understand about touch DNA is that in many cases—this case included—the DNA analyst is not able to obtain a full DNA profile from the "touch" sample. When the profile identifiable from the sample is only a fragment of a full DNA profile, the case becomes less like *Council* or *Ramsey*, and the analyst will be less able to identify the perpetrator or exclude any given suspect. See *Commonwealth v. Clark*, 34 N.E.3d 1, 13 n.13 (Mass. 2015) (stating "'touch DNA' or 'trace DNA'" emerged in 1997 after scientists "reported that DNA profiles could be generated from touched objects," which "opened up possibilities and led to the collection of DNA from a wider range of exhibits") (quoting Roland AH van Oorschot, et al., *Forensic Trace DNA: A Review*, in 1:14 INVESTIGATIVE GENETICS 1, 2 (2010)); *Bean v. State*, 373 P.3d 372, 377 (Wyo. 2016) (describing touch DNA in general terms).

Courts and legal commentators have recognized problems with the admission of touch DNA evidence in criminal trials. The Texas Court of Criminal Appeals recently wrote, "Touch DNA poses special problems because 'epithelial cells are ubiquitous on handled materials,' because 'there is an uncertain connection between the DNA profile identified from the epithelial cells and the person who deposited them,' and because 'touch DNA analysis cannot determine when an epithelial cell was deposited.'" *Hall v. State*, 569 S.W.3d 646, 658 (Tex. Crim. App. 2019)

(quoting *Reed v. State*, 541 S.W.3d 759, 777 (Tex. Crim. App. 2017)). Touch DNA is sometimes referred to as "trace DNA." One commentator recently wrote, "These trace samples lack the clarity of the more straightforward DNA evidence that can lead to a clear match to a specific individual." Bess Stiffelman, *No Longer the Gold Standard: Probabilistic Genotyping Is Changing the Nature of DNA Evidence in Criminal Trials*, 24 Berkeley J. Crim. L. 110, 115 (2019); see also *Dist. Attorney's Office for Third Judicial Dist. v. Osborne*, 557 U.S. 52, 82, 129 S. Ct. 2308, 2327, 174 L. Ed. 2d 38, 60 (2009) (Alito, J., concurring) (stating as to touch DNA that "modern DNA testing technology is so powerful that it actually increases the risks associated with mishandling evidence").

Gallman's testimony also included "non-exclusion" DNA evidence. Gallman stated,

I take this person's DNA profile and I compare it to the information that was taken from the evidence. I check to see if their information is within this mixture and if their information is within this mixture, that means that I cannot exclude it, exclude them.

As with touch DNA, courts have identified problems with non-exclusion DNA. As the Kentucky Supreme Court recently stated,

[S]everal courts have held that DNA "match" or "non-exclusion" evidence is inadmissible without reliable accompanying evidence as to the likelihood that the test could or could not exclude other individuals in a given population. Without the accompanying evidence, these courts note "the jury have no way to evaluate the meaning of the result."

Duncan v. Commonwealth, 322 S.W.3d 81, 92 (Ky. 2010) (quoting *Commonwealth v. Mattei*, 920 N.E.2d 845, 856 (Mass. 2010) (collecting cases)).

Gallman also testified to the related concept "random match probability." Of the DNA concepts we have just discussed, random match probability has perhaps the most potential for confusion. See *State v. Bloom*, 516 N.W.2d 159, 162 (Minn. 1994) (recognizing that the "admission of the random match probability figure will confuse jurors"). Random match probability is the likelihood that another randomly chosen

person—unrelated to the suspect—will have a DNA fragment identical to the fragment the analyst found in the touch sample. The probability of a random match in any given case depends on the size of the fragment the analyst can obtain from the touch sample. Thus, the more complete the fragment, the less likely another person could randomly match it. The smaller the fragment, on the other hand, the more likely some other person will also have the identical fragment, and would then be a "random match."

The Kentucky Supreme Court addressed random match probability in *Duncan*, stating, "For smaller profiles, . . . those based on partial matches, . . . the odds of a random match can be much higher and the inference that the source of the known sample was also the source of the unknown sample much weaker." 322 S.W.3d at 90; *see Bloom*, 516 N.W.2d at 162 (describing the difficult chain of inferences a juror must follow to get from the probability of a random match to an accurate understanding of the likelihood of guilt (citing Jonathan J. Koehler, *Error and Exaggeration in the Presentation of DNA Evidence at Trial*, 34 *Jurimetrics J.* 21, 35 (1993))).⁵ The Supreme Court of the United States addressed how random match probability creates risk that jurors will confuse it with a statistical probability of guilt, referring to the risk as the "prosecutor's fallacy." *McDaniel v. Brown*, 558 U.S. 120, 128, 130 S. Ct. 665, 670, 175 L. Ed. 2d 582, 588 (2010) (citation omitted); *see also* Ming W. Chin et al., *FORENSIC DNA EVIDENCE: SCIENCE AND THE LAW* § 5:2

⁵ *See also* 7 Clifford S. Fishman & Anne T. McKenna, *JONES ON EVIDENCE* § 60:27 (7th ed. 2019) (cautioning "Care should be exercised as to how the statistic probabilities are expressed in the courtroom," and stating "it is easy and unfortunately only too frequent for both the prosecution and the defense to make errors in presenting the information to the court"); Lieberman *supra*, at 32 (explaining that when a DNA expert "provides statistics on the frequency of the matching profile . . . [,] [t]he complexity of mathematical computations used to determine the probability of a match may leave jurors with some degree of confusion and uncertainty"); Kimberly Cogdell Boies, *Misuse of DNA Evidence Is Not Always A "Harmless Error": DNA Evidence, Prosecutorial Misconduct, and Wrongful Conviction*, 17 *Tex. Wesleyan L. Rev.* 403, 417 (2011) ("The formulas used to determine statistical probability of a match produce a result that is difficult for a layperson to understand.").

(2019) (stating "the prosecutor's fallacy . . . confuses random match probability with a source (or guilt) probability statement").⁶

Thus, even when the concepts of touch DNA, non-exclusion DNA, and random match probability are completely and accurately presented to a jury, there is significant potential the testimony will be confusing and misleading.

III. Analysis of Error

We have repeatedly discussed the trial court's "gatekeeping" role regarding the admission of expert testimony. In *Council*, for example, we framed our discussion around the trial court's responsibility to ensure the expert testimony meets the requirements of Rules 702 and 403. We emphasized "the trial judge must find" the Rule 702 elements are satisfied. 335 S.C. at 20, 515 S.E.2d at 518. We held, "The trial judge should . . . determine reliability," and "the trial judge should determine if its probative value is [substantially] outweighed by" the dangers listed in Rule 403. *Id.* We have repeatedly enforced the requirement that trial courts exercise their gatekeeping responsibility in admitting expert testimony. *See, e.g., Graves v. CAS Med. Sys., Inc.*, 401 S.C. 63, 75, 735 S.E.2d 650, 656 (2012) (affirming the trial court's exclusion of the plaintiff's experts' opinions and stating "the court must . . . exercise its role as gatekeeper"); *Watson v. Ford Motor Co.*, 389 S.C. 434, 445, 699 S.E.2d 169, 174 (2010) (reversing the trial court's failure to exercise its role as gatekeeper and stating "the trial court serves as the gatekeeper and must decide whether the evidence submitted by a party is admissible pursuant to the Rules of Evidence as a matter of law").

The proponent of scientific evidence has a corresponding responsibility to provide the trial court the factual and scientific information the court needs to carry out its gatekeeping duty. In *Council*, *Graves*, and *Watson*, the proponent went to great lengths in a hearing outside of the jury's presence to provide a sufficient factual and

⁶ This writer has been an Associate Justice on the Supreme Court of California since 1996. Justice Chin—"a nationally renowned expert on DNA evidence"—is set to retire later this year. Merrill Balassone, *Justice Ming Chin to Retire from California Supreme Court*, CAL. CTS. NEWSROOM (Jan. 15, 2020), <https://newsroom.courts.ca.gov/news/justice-ming-chin-to-retire-from-california-supreme-court>.

scientific basis for the court to consider as gatekeeper. In *Council*, the State presented live, detailed testimony from the FBI expert explaining the history of the mitochondrial DNA analysis method, his training in the method, and precisely how the method is used. 335 S.C. at 17-18, 515 S.E.2d at 516-17. Similarly, in *Graves* and *Watson*, the civil plaintiffs who sought to introduce the opinion testimony presented deposition testimony of their experts and/or live testimony outside the presence of a jury,⁷ and each expert explained in detail the factual and scientific basis for their opinions. *Graves*, 401 S.C. at 70-72, 735 S.E.2d at 653-54; *Watson*, 389 S.C. at 447-48, 699 S.E.2d at 176.

In this case, the State did basically nothing to give the trial court a sufficient factual and scientific basis upon which to carry out its gatekeeping responsibility. First, the State did not call Gallman—or any witness with any knowledge of Gallman's testimony or its factual or scientific basis—to testify at the hearing on Phillips' motion to exclude her testimony. Under that circumstance alone, it was impossible for the trial court to meaningfully determine whether Gallman's testimony satisfied the Rule 702 elements, or should be excluded under Rule 403.

Second, the State made almost no effort to educate the trial court on the factual and scientific basis of Gallman's opinions. Before any expert opinion may be admitted into evidence, the proponent of the opinion must convince the trial court that each element of the Rule 702 foundation has been established. *See State v. Von Dohlen*, 322 S.C. 234, 248, 471 S.E.2d 689, 697 (1996) ("The party offering the expert has the burden of showing his witness possesses the necessary learning, skill, or practical experience to enable the witness to give opinion testimony."), *overruled on other grounds by State v. Burdette*, 427 S.C. 490, 832 S.E.2d 575 (2019); *see also United States v. Williams*, 865 F.3d 1328, 1338 (11th Cir. 2017) (stating "the proponent of expert testimony bears the burden of demonstrating the expert's qualifications and competence to give his proposed testimony"). In addition, when the opponent makes a Rule 403 objection, the proponent must demonstrate the probative value of the evidence. In the pre-trial hearing in this case, the only person who spoke on behalf of the State was the assistant solicitor. She spoke only briefly, and to the extent she said anything about the concepts of touch DNA, non-exclusion DNA, or random

⁷ In *Graves*, the testimony was presented in a pre-trial *Daubert/Council* hearing. *See* 401 S.C. at 73, 735 S.E.2d at 655 (describing the trial court's analysis of the expert's depositions before excluding the expert opinion and granting summary judgment).

match probability, the statements she made were mostly wrong. We will address her incorrect statements below.

Gallman did address each concept in her testimony before the jury, but the assistant solicitor never asked Gallman any questions that allowed her to explain the concepts in detail. As to touch DNA, Gallman described it generally as follows,

But when you talk about touch DNA, it's based on whether -- like I say, touch DNA, whether I touch an item or I didn't. You can touch an item and still you will not get a full DNA profile from that touch. So touch DNA is basically like a luck of the draw, whether you leave your cells or you didn't or you left a couple of cells, but it wasn't enough information to detect that you were there.

Shortly after this testimony, the assistant solicitor asked Gallman if she obtained a full DNA profile for the standards, asking, "Were you able to develop a full profile and get all sixteen numbers for the defendant, Billy Phillips?" Gallman answered, "Yes." Immediately thereafter, however, "Turning your attention to the items of evidence that you tested," as she directed Gallman, the assistant solicitor did not ask Gallman whether she got a full DNA profile from the touch samples. Gallman then proceeded to make three statements that incorrectly indicated she did get a full DNA profile from the gun. She testified with respect to the gun, "With this particular sample, when I developed the DNA profile of the DNA obtained from it," and "it's basically a genetic footprint or fingerprint of who had potentially touched the gun," and "I was developing a DNA profile from whatever skin cells were left there." At no other point did the assistant solicitor ask Gallman to give any explanation of the nature of touch DNA, particularly the significant fact that the touch DNA samples in this case revealed only fragments, not full DNA profiles.

In subsequent testimony, Gallman hardly explained that the touch DNA samples revealed only a fragment of a full DNA profile. Gallman referred to the samples not as fragments, but as "the swab from the gun" and "the swab from the right front pocket." Finally, she testified,

[W]e're able to develop a DNA profile from evidence and then also develop a DNA profile from a standard. It could be from a person's blood or what we call a buccal swab,

when they swab inside someone's, within your mouth, and compare that to the evidence to see whether it matches or it does not match.

The striking omission of a meaningful explanation that the touch samples Gallman obtained in this case revealed only fragments of a full DNA profile left the jury with the incorrect impression Gallman matched Phillips' DNA standard with a full DNA profile he left behind on the gun and in the pocket.

In similar fashion, the State elicited from Gallman only general descriptions of non-exclusion DNA and random match probability. Of the concerns recited by the courts and academic authorities discussed above, the State addressed none of them. We are particularly troubled by the State's failure to elicit from Gallman any explanation of the method she used to calculate the probability that some other person—not Phillips—contributed the DNA on the gun or in the jeans pocket. As Gallman testified, she is "required to tell you how often you would see this mixture in a population." There must, however, be some method she followed in arriving at this probability. She explained no method, stating only, "So based on the information that I could use to generate a statistic, the value is one in two hundred." As to the jeans pocket, she stated only, "I compared the DNA [standards] to the evidence . . . and the next step is to give a statistical value to that mixture, and the probability of randomly selecting an unrelated individual who could have contributed to this mixture is approximately one in two."

The method of making these calculations is undoubtedly complicated. As some of the academic writers referred to above stated, "The formulas used to determine statistical probability of a match produce a result that is difficult for a layperson to understand," Boies, *supra*, at 417, and, "The complexity of mathematical computations used to determine the probability of a match may leave jurors with some degree of confusion and uncertainty," Lieberman, *supra*, at 32. The difficulty of making or explaining the calculation does not mean, however, the method for doing so may be ignored. Rather, the method by which a DNA analyst calculates random match probability must be explained. "To say that two patterns match, without providing any *scientifically valid* estimate . . . of the frequency with which such matches might occur by chance, is meaningless." National Research Council, *supra* note 2, at 9 (emphasis added).

In addition, much of the information the State did provide the trial court and jury was simply wrong. We begin with the assistant solicitor's presentation to the trial court in the pre-trial hearing. Following up on her answer to the court's question in which she stated three people—including Phillips—could not be excluded from the mixture of DNA found on the gun, the assistant solicitor said, "That means their DNA is there, and if [defense counsel] had spoken to Ms. Gallman, . . . she would have been able to explain that to him." The court then asked her, "Well, are you saying that Billy Phillips' DNA is on the weapon," to which she responded, "It is."

The assistant solicitor's statements are wrong. She appeared to recognize her error moments later when she stated, "Your Honor, I mis-spoke." She then proceeded, however, to make another series of incorrect statements. She said, "It does not say that it is 100% Billy Phillips' DNA in that mixture of contributors, but it says that he cannot be excluded as a contributor to the three. It also lists two other names. 'Cannot be excluded' means the same thing as can be included." She then stated, "The DNA itself, it stands for itself."

Actually, if defense counsel had talked to Gallman, Gallman would certainly have told him she did not know whether Phillips' DNA was on the gun, or in the jeans pocket. She would also have told him "cannot be excluded" most certainly does not mean "can be included,"⁸ and she would have taken pains to be clear the DNA does not "stand for itself." Rather, DNA—particularly touch DNA—is a complicated scientific field of study that requires detailed explanation given by a trained scientist like Gallman, elicited by an experienced trial lawyer who has taken the time to prepare herself for trial.

In Gallman's testimony, there were more incorrect statements. Responding to confusing questions from the assistant solicitor, Gallman conflated (1) a finding that an individual can be excluded as a contributor to a DNA mixture with a finding that

⁸ The State's casual use of scientific terms is striking. When Gallman testified she could not exclude Phillips as a contributor, she meant that whatever fragment of a DNA profile she found on the evidence matched a fragment of Phillips' full DNA profile. The corollary to her "cannot be excluded" testimony as to Phillips is that a DNA fragment identical to Phillips' fragment is included. That is not the same as saying Phillips' full DNA profile is included. In fact, Gallman does not know whose DNA is in the mixture; she knows only that she found a DNA fragment that could have been left by quite a few people.

the excluded individual never touched the item, and (2) a finding that a fragment of a person's DNA is on an item with a finding the person touched the item.

SOLICITOR: Okay. So, using again, I guess an example of, say, these scissors. If I had never touched the scissors and did not leave any cells on it, would the language be, could not be excluded, or would it be outright excluded?

GALLMAN: It would be excluded.

SOLICITOR: Okay. So, if multiple people have handled the scissors, and you're able to get numbers, DNA numbers off of the scissors and you find that there's at least three, that just means that I have left part of my DNA on there. Correct?

GALLMAN: It means that you left cells, skin cells on that item.

We do not fully understand the assistant solicitor's questions, so Gallman probably did not understand them either. The answers, however, are wrong. As to the first answer, if the assistant solicitor never touched the scissors, but another person who did touch them left a DNA fragment behind that is identical to a fragment in the assistant solicitor's DNA profile, Gallman could not have excluded the assistant solicitor because Gallman would not know which of the two left the fragment. The incorrect answer suggests that if Phillips had not touched the gun or had his hand in the jeans pocket, he would have been excluded. To the contrary, it is entirely possible that Phillips did not put his hand in Woods' pocket, but someone with an identical DNA fragment did, and still Gallman could not exclude Phillips as a contributor. As to the jeans pocket, the assistant solicitor's confusing question and Gallman's incorrect answer wrongly suggest we know Phillips had his hand in Woods' pocket. We do not know that.

As to the second answer, if multiple people touched the scissors, and one of them left behind a DNA fragment identical to a fragment in the assistant solicitor's DNA profile, that does not mean the assistant solicitor left cells there. This is in fact the concept of random match probability the State failed to explain. There is always some chance another person left those cells, but the person has an identical DNA

fragment. So, only one of the two touched the item, but neither can be excluded. The answer suggests—wrongly—Gallman was giving her opinion that Phillips had his hand in the pocket. She was not.

Also as to the second answer, there are other plausible ways a fragment of a person's DNA might be found on the scissors when the person did not themselves touch them. "Touch DNA is . . . subject to what is known as secondary transfer. This refers to the 'possibility that an individual or an object may serve as a conduit between a source and a final destination without any direct encounter.'" *Bean*, 373 P.3d at 377-78 (quoting 4 David L. Faigman et al., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 30:13 (2015–2016 ed.)); *see also* 7 Clifford S. Fishman & Anne T. McKenna, JONES ON EVIDENCE § 60:10 (7th ed. 2019) (explaining "'Secondary transfer' occurs when DNA left on one surface is inadvertently transferred to another surface" and noting "the risk is greatest with regard to touch DNA"). In other words, it is quite possible the assistant solicitor never touched the scissors, but cells she left on another surface were transferred there and tested as part of the touch DNA sample. In that event—contrary to Gallman's second answer—the assistant solicitor's DNA was on the scissors, but she had not left DNA there.

We review a trial court's decision to admit or exclude evidence under a deferential standard for an abuse of discretion. *State v. Dickerson*, 395 S.C. 101, 116, 716 S.E.2d 895, 903 (2011). In this case, however, the State did not give the trial court the factual and scientific basis the court needed to meaningfully exercise that discretion. The trial court was essentially left in the dark as to the difficult concepts of touch DNA, non-exclusion DNA, and random match probability. As to the misstatements made by the assistant solicitor and Gallman, the trial court was kept out of the position of even suspecting the statements might be incorrect.

We are aware that our "analysis of error" reads as if we are second-guessing the trial court. However, because the trial court did not require the State to present the factual and scientific foundation for Gallman's testimony in a *Daubert/Council* hearing before she testified to the jury, we are actually conducting the analysis for the first time. The trial court should have required the State to present the factual and scientific information necessary to establish the foundation required by Rule 702. The trial court also should have conducted an on-the-record balancing of probative value and the danger of confusion of the issues and misleading the jury required by

Rule 403. In that event, instead of conducting our own analysis, we could review the trial court's analysis under the proper standard of deference.

The root of the trial court's error, however, is a series of failures by the State. First, the State failed to present the testimony of its expert witness at the hearing at which the trial court was to consider the admissibility of the expert's opinion. Second, the State presented an incomplete factual and scientific basis for the admission of the expert's opinion. Third, the State did not explain to the jury the complicated DNA concepts involved in this case. Fourth, the State presented incorrect information about its DNA evidence. Finally—as we will explain—the assistant solicitor misstated to the trial court and the jury that Phillips' DNA was on the gun and in the jeans pocket.

IV. Harmless Error

The State argues that even if the trial court erred in admitting Gallman's DNA testimony, the error was harmless. We disagree. While the State presented considerable circumstantial evidence supporting Phillips' guilt, it did not offer any evidence that conclusively proved Phillips' guilt. *See State v. Pagan*, 369 S.C. 201, 212, 631 S.E.2d 262, 267 (2006) (stating "an insubstantial error not affecting the result of the trial is harmless where 'guilt has been conclusively proven . . . such that no other rational conclusion can be reached.'" (quoting *State v. Bailey*, 298 S.C. 1, 5, 377 S.E.2d 581, 584 (1989))).

As part of our harmless error analysis, we review "the materiality and prejudicial character of the error" in the context of the entire trial. *State v. Byers*, 392 S.C. 438, 447-48, 710 S.E.2d 55, 60 (2011). To evaluate this context, we must consider the assistant solicitor's misstatements. In addition to those already discussed, she told the trial court in response to Phillips' directed verdict motion, "I believe with his DNA being on the murder weapon, along with other things, along with the eyewitness testimony, there is absolutely substantial evidence." The trial court then asked, "Is his DNA actually on there?" She responded, "His DNA is on the gun in the form that he cannot be excluded." Both statements are wrong.

More importantly, however, the assistant solicitor made misstatements in her closing argument to the jury. On several occasions she repeated the false statement that if a person does not touch an item he will be excluded. She stated, for example, "If you don't touch it, you are automatically excluded. One hundred percent excluded." She

also told the jury Gallman found Phillips' DNA on the gun and in the jeans pocket. She stated, "Well, we have his DNA on that gun," and "We also know that defendant's DNA is on the murder weapon and inside [Woods'] pocket," and "Had he not touched the gun or the pocket, his DNA would not be there."

The "prosecutor's fallacy" the Supreme Court and Justice Chin warn about involves risk the jury might unknowingly or accidentally confuse the complicated concepts underlying DNA evidence. Such innocent confusion was certainly a risk in this case. We need not determine whether the risk of innocent confusion materialized in this case, however, because the incorrect statements in closing argument all but guaranteed the jury was confused and misled. If there were any possibility we might find the error of admitting the evidence harmless, the assistant solicitor extinguished that possibility with her incorrect statements in her closing argument. *See Duncan*, 322 S.W.3d at 91-93 (finding it was improper for prosecutor to state in closing argument that "not excluded" was the same as "included," and holding "given the immense weight jurors are apt to accord DNA evidence," the prosecutor's statements "rendered [the defendant's] trial manifestly unfair"); *Whack*, 73 A.3d at 189 (finding trial court erred in denying mistrial because prosecutor in closing argument "told jurors that [defendant's] DNA was present" when expert actually testified "she could not exclude [defendant] as being the source of DNA"); *Bloom*, 516 N.W.2d at 169 (stating "we will not hesitate to award a new trial . . . if . . . DNA identification evidence was presented in a misleading or improper way").

V. Conclusion

DNA evidence is a complicated scientific subject. In *Council*, we held "the trial judge was well within his discretion in finding the results of the [mitochondrial] DNA analysis admissible." 335 S.C. at 21, 515 S.E.2d at 518. That does not mean that every time a party offers DNA evidence it is admissible. Rather, if an objection is made, the trial court must hold a *Daubert/Council* hearing, the proponent of the evidence must present the factual and scientific basis necessary to satisfy the foundational elements of Rule 702, and the trial court must conduct an on-the-record balancing of probative value against the applicable Rule 403 dangers. The trial court should make specific findings as to each contested element or issue.

By not conducting a *Daubert/Council* hearing, the trial court left itself without a meaningful opportunity to exercise its discretion. The State failed to establish the "assist the trier of fact" element, and the probative value of the DNA evidence is

substantially outweighed by danger the evidence would confuse the issues and mislead the jury. We reverse Phillips' convictions and remand for a new trial.

REVERSED.

KITTREDGE and JAMES, JJ., concur. BEATTY, C.J., concurring in result only in a separate opinion in which HEARN, J., concurs.

CHIEF JUSTICE BEATTY: Respectfully, I concur in result. While I agree with the conclusion reached by the majority, I disagree with the majority's reference to a "*Daubert/Council*" hearing. Because this Court has expressly declined to adopt *Daubert*,⁹ I believe the majority's instruction regarding a "*Daubert/Council*" hearing is confusing and constitutes an implicit adoption of *Daubert*.

As the majority correctly recognizes, in *State v. Council*, 335 S.C. 1, 515 S.E.2d 508 (1999), this Court was presented with an opportunity to analyze the admissibility of expert opinion on DNA evidence under the new South Carolina Rules of Evidence. In *Council*, this Court identified the procedure trial judges should use in deciding whether to admit scientific evidence. Specifically, the Court stated:

While this Court does not adopt Daubert, we find the proper analysis for determining admissibility of scientific evidence is now under the SCRE. When admitting scientific evidence under Rule 702, SCRE, the trial judge must find the evidence will assist the trier of fact, the expert witness is qualified, and the underlying science is reliable. The trial judge should apply the Jones^[10] factors to determine reliability. Further, if the evidence is admissible under Rule 702, SCRE, the trial judge should determine if its probative value is outweighed by its prejudicial effect. Rule 403, SCRE. Once the evidence is admitted under these standards, the jury may give it such weight as it deems appropriate.

Id. at 20–21, 515 S.E.2d at 518 (emphasis added).

Since 1999, *Council* has remained the standard by which trial judges have decided whether to admit scientific evidence. Although our appellate courts have referenced *Daubert* in at least ten cases since 1999, our courts have consistently adhered to *Council* and repeatedly declined to adopt *Daubert*. See, e.g., *State v. Jones*, 383 S.C. 535, 548 n.5, 681 S.E.2d 580, 587 n.5 (2009) (citing *Council* and reiterating that the Court declined to adopt *Daubert*); *State v. Warner*, No. 5717,

⁹ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993) (adopting new standard for determining the admissibility of scientific evidence under Rule 702 of the Federal Rules of Evidence).

¹⁰ *State v. Jones*, 273 S.C. 723, 259 S.E.2d 120 (1979).

2020 WL 1696716, at * 3 (Ct. App. Apr. 8, 2020) ("South Carolina has not adopted *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 594-95, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), by name, nor has it revised Rule 702, SCRE, to incorporate the *Daubert* framework. Nevertheless, our approach is 'extraordinarily similar' to the federal test." (citation omitted)).

Without explanation, the majority departs from more than twenty years of precedent and appears to implicitly adopt *Daubert* by creating a hybrid *Daubert/Council* test. I believe this departure is unwarranted and will create confusion. Although our appellate courts have recognized the similarities between *Daubert* and *Council*, there is a distinction that caused this Court to decline to adopt the *Daubert* test. The majority has neither addressed this distinction nor outlined the procedure in the new test.

As the majority aptly points out, trial judges are the gatekeepers regarding the admission of scientific evidence and expert testimony. In order to fulfill this significant role, our judges must have a clear understanding of the correct test for admissibility. I believe *Council* remains the correct test.

Having addressed my substantive concerns with the majority's opinion, I now turn to an observation that is equally concerning. As part of its analysis, the majority castigates the prosecutor in this case. To some extent, this rebuke is warranted. The prosecutor was at times evasive, if not misleading, when responding to some of the trial judge's questions and arguing before the jury. Yet, it is questionable whether this was intentional. Further, the prosecutor does not bear sole responsibility of ensuring that only admissible evidence is put before the judge and jury. Rather, the primary responsibility lies with the judge, who is the gatekeeper regarding the admission of all evidence.

Based on the foregoing, I concur in the majority's decision to reverse Phillips's convictions and remand for a new trial. On remand, if an objection is raised regarding the DNA evidence, I believe the trial judge must hold a hearing in accordance with *Council*.

HEARN, J., concurs.