

IN THE COURT OF APPEALS OF NORTH CAROLINA

No. COA19-1083

Filed: 31 December 2020

Pitt County, Nos. 17 CRS 58458–60

STATE OF NORTH CAROLINA

v.

CALVIN LEE MILLER

Appeal by defendant from judgments entered 31 October 2018 by Judge Walter H. Godwin, Jr., in Pitt County Superior Court. Heard in the Court of Appeals 25 August 2020.

Attorney General Joshua H. Stein, by Special Deputy Attorney General Steven Armstrong, for the State.

Appellate Defender Glenn Gerding, by Assistant Appellate Defender Amanda S. Zimmer, for defendant.

DIETZ, Judge.

Defendant Calvin Lee Miller appeals multiple felony convictions all related to his attempt to murder his wife with a rifle. Miller argues that the trial court committed plain error by admitting a video showing him kicking his dog. He also challenges the admission of testimony from the State's forensic firearms expert, arguing that the expert's ballistics comparison was unreliable under Rule 702. Finally, Miller challenges the trial court's decision to instruct the jury on flight.

As explained below, the trial court's admission of the challenged video, even if

we were to assume it was error, does not rise to the level of plain error. The court's admission of the testimony of the State's expert was within the court's sound discretion. And the instruction on flight was supported by the evidence in the record. Accordingly, we find no plain error in part and no error in part in the trial court's judgments.

Facts and Procedural History

Defendant Calvin Lee Miller was married to his wife, Charlene, for 34 years. Miller and Charlene lived together until October 2017, when Charlene moved out due to Miller's drinking and abusive behavior.

After Charlene moved out, Miller repeatedly contacted her by phone, text message, and showing up at her workplace. He vacillated between asking her to return home, promising to quit drinking, and telling her that he hated her. Charlene told Miller not to come to the store where she worked if he had been drinking. On at least one occasion, Miller texted Charlene to warn her that her "day was coming." On another occasion, Miller told Charlene to pick up some of her possessions from their home and then sent pictures of her "stuff on fire."

On 3 December 2017, Miller and Charlene's adult daughter, Kortney, recorded video on her cell phone of Miller threatening to harm Charlene. Charlene was not present at the time. Miller also threatened Kortney, who was pregnant, with his .22 caliber rifle. Kortney's husband, Akia, grabbed Miller and the gun, telling Miller to

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never raise a gun to Kortney again. Kortney then heard Miller threaten to shoot his dog and heard several gunshots around the house. Akia also heard 13 loud noises that sounded like firecrackers and later saw the resulting bullet holes. After this incident, Akia and Kortney collected some of the shell casings left behind and placed them in a plastic baggie.

Kortney later told Charlene that Miller had a .22 caliber rifle and had threatened to harm Charlene nearly every day since he realized Charlene “wasn’t coming home for sure.” Based on the threats, Charlene obtained a domestic violence protective order against Miller.

On 5 December 2017, Charlene arrived at work around 6:15 a.m. She had the protective order with her but inadvertently left it in her car. Charlene did not know if Miller had been served with the order and went back out to her car to get it in case Miller showed up.

In the parking lot, Charlene was shot twice in the head with .22 caliber bullets, one hitting her in the jaw and the other hitting the top of her scalp. Charlene ran back inside the store and called 911. Police arrived and questioned Charlene about the shooting. She stated that she did not see the shooter but that it was Miller. EMS transported Charlene to the hospital where she was treated for her injuries for two weeks.

While investigating the shooting, officers searched the parking lot and

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recovered three spent shell casings and two live rounds of .22 caliber bullets. Around five hours after the shooting, a highway patrol officer saw Miller walking along a road not far from the scene of the shooting. The officer and Miller saw each other, and Miller raised and then lowered his hands before walking toward a wooded area. Miller entered the wood line, came back out again, and began walking toward the officer. But when Miller again saw the officer and made eye contact, he turned and went back into the woods. A few moments later, a K-9 unit joined the search and located Miller. Officers found Miller lying on the ground, “curled up in a ball, almost in the fetal position, laying down behind a large oak tree.”

Miller was intoxicated, with extremely slurred speech, and said “something about not having a rifle” and “[y]’all know I wouldn’t hurt my woman, my old lady.” The officers had only directed Miller to “[s]urrender” and had not yet told Miller “why he had been stopped.” Officers recovered .22 caliber live rounds when they searched Miller, but they did not recover a firearm in their investigation.

On 26 February 2018, Miller was indicted for attempted first degree murder, assault with a deadly weapon with intent to kill inflicting serious injury, and possession of a firearm by a felon. The case went to trial. At trial, Charlene, Kortney, and Akia testified to the events described above.

The State also presented the videos Kortney made on her cell phone. The videos showed Miller threatening Charlene and Kortney and pointing the gun at Kortney.

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Kortney identified the item Miller was holding as a “.22 rifle.” The videos also showed Miller kick and threaten his small dog. Miller did not object to the admission of the videos. Akia identified a photograph of himself and Miller, screenshotted from the video Kortney took in December 2017, showing Miller holding his .22 caliber rifle.

The State also presented the testimony of Kathleen Clardy, a scientist from the firearms unit of the State Crime Lab, as an expert in the field of firearm examination. Miller objected, and the trial court conducted *voir dire*. At the conclusion of the *voir dire*, the trial court ruled that Clardy’s testimony was admissible under Rule 702 after finding that her testimony was “the product of reliable principles and method[s]” and that she “applied these principles and methods to the facts of this particular case.”

Clardy then testified about her examination of the various shell casings collected during the investigation. Clardy described in detail how she examined the markings on the casings under a microscope and concluded that all of the casings she examined were fired from the same firearm based on a comparison of specific markings she observed on the casings. Clardy then had another examiner peer review her work, and that examiner reached the same conclusion.

On 31 October 2018, the jury convicted Miller of all charges. The trial court sentenced Miller to 207 to 261 months in prison for attempted first degree murder and a consecutive consolidated sentence of 96 to 128 months for assault with a deadly

weapon with intent to kill inflicting serious injury and possession of a firearm by a felon. Miller appealed.

Analysis

I. Plain error challenge to admission of video

Miller first argues that the trial court committed plain error by admitting the video showing him kicking his dog. Miller contends that the video was irrelevant, was improper character evidence, and was unduly prejudicial.

Miller acknowledges that he did not object to the admission of the video, and therefore, we review these arguments solely for plain error. *See* N.C. R. App. P. 10(a)(4). “For error to constitute plain error, a defendant must demonstrate that a fundamental error occurred at trial.” *State v. Lawrence*, 365 N.C. 506, 518, 723 S.E.2d 326, 334 (2012). “To show that an error was fundamental, a defendant must establish prejudice—that, after examination of the entire record, the error had a probable impact on the jury’s finding that the defendant was guilty.” *Id.* In other words, Miller must “show that, absent the error, the jury probably would have returned a different verdict.” *Id.* at 519, 723 S.E.2d at 335.

Here, we need not address whether admitting the video was error because, even assuming that it was, Miller cannot satisfy the prejudice prong of the plain error test. *State v. Blankenship*, 259 N.C. App. 102, 122, 814 S.E.2d 901, 916 (2018). When viewed in the context of all the evidence at trial, the challenged portion of the video,

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showing Miller kicking his dog, was “of relative insignificance” in light of the other overwhelming evidence of guilt offered by the State. *State v. Phillips*, 268 N.C. App. 623, ___, 836 S.E.2d 866, 875 (2019).

For example, the State presented evidence from several witnesses that, leading up to the shooting, Miller made repeated threats against Charlene’s life and stated that he was going to kill her. Charlene testified that Miller was the only person who had threatened her and that, based on Miller’s threats and actions, she had obtained a protective order against him. The State also presented evidence that Miller possessed and used a .22 caliber rifle several days before the shooting and that, at that time, he made threats directed at Charlene.

After the shooting, law enforcement found Miller near the scene. When officers followed Miller into a wooded area, they found him curled up behind a tree. Before the officers told Miller why they were approaching him, Miller told the officers about “not having a rifle” and that “I wouldn’t hurt my woman.” The officers found live rounds of ammunition when they searched Miller that matched the type of ammunition found at the crime scene. Likewise, shell casings that Miller fired from his .22 caliber rifle several days before the shooting matched the shell casings recovered from the scene of the crime.

Finally, during trial, several witnesses testified that Miller abused or threatened his dog, with one testifying that Miller was “mean to the dog, kicking it

around” and another testifying that Miller threatened to shoot the dog. Miller does not challenge the admission of this testimony on appeal.

In light of all this evidence, Miller cannot show that, had the trial court excluded the portions of the challenged video that showed Miller kicking his dog, the jury probably would have reached a different verdict. The evidence of Miller’s guilt was overwhelming, and the video itself, when viewed in the context of this other evidence, had no probable impact on the verdict. *Lawrence*, 365 N.C. at 518, 723 S.E.2d at 334; *Phillips*, 268 N.C. App. at ___, 836 S.E.2d at 875. Accordingly, the trial court did not commit plain error by admitting the challenged portion of the video.

II. Admission of testimony from the State’s forensic firearms expert

Miller next argues that the trial court abused its discretion by admitting the testimony of the State’s firearms expert, Kathleen Clardy, because her opinions on ballistics comparison and identification were unreliable under Rule 702 of the Rules of Evidence. Miller contends that Clardy’s testimony was not based on reliable principles or methods and that Clardy did not apply those principles or methods reliably to the facts of this case. Under the applicable standard of review, we must reject this argument.

A trial court’s ruling on the admissibility of expert testimony under Rule 702 “will not be reversed on appeal absent a showing of abuse of discretion.” *State v. McGrady*, 368 N.C. 880, 893, 787 S.E.2d 1, 11 (2016). This Court can find that a trial

court abused its discretion “only upon a showing that its ruling was manifestly unsupported by reason and could not have been the result of a reasoned decision.” *Id.*

Under Rule 702, expert testimony, to be admissible, must satisfy a three-pronged reliability test: (1) the testimony must be based upon sufficient facts or data, (2) the testimony must be the product of reliable principles and methods, and (3) the witness must have applied the principles and methods reliably to the facts of the case. *See* N.C. R. Evid. 702(a)(1)–(3); *McGrady*, 368 N.C. at 890, 787 S.E.2d at 9.

“The precise nature of the reliability inquiry will vary from case to case depending on the nature of the proposed testimony. In each case, the trial court has discretion in determining how to address the three prongs of the reliability test. The trial court must have the same kind of latitude in deciding *how* to test an expert’s reliability . . . as it enjoys when it decides *whether* that expert’s relevant testimony is reliable.” *McGrady*, 368 N.C. at 890, 787 S.E.2d at 9 (citation omitted). “In its discretion, the trial court should use those factors that it believes will best help it determine whether the testimony is reliable in the three ways described in the text of Rule 702(a)(1) to (a)(3).” *Id.*

Miller cites to case law from other jurisdictions as well as to reports from the National Research Council and the President’s Council of Advisors on Science and Technology, arguing that those cases and reports support the broad proposition that ballistics identification is “not reliable” and that federal courts have begun limiting

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“the nature and scope of permissible ballistics opinion testimony under Rule 702.” But Miller made these same arguments, relying on this same general information, to the trial court. After Miller objected to the admission of Clardy’s expert testimony, the trial court conducted a lengthy *voir dire* with both parties questioning Clardy. When asked about the error rate for this type of ballistics identification, Clardy testified that “my error rate is zero percent,” but that there is no established error rate for the field as a whole. Miller questioned Clardy about the President’s Council of Advisors on Science and Technology report that criticized the scientific validity of firearms examination. Clardy responded that she disagreed with elements of the report and asserted that the report should be viewed with caution because it was created by academics rather than firearms examiners.

Clardy also testified about how she uses a microscope to examine the common identifying markings on shell casings and how that process, with the shell casings at issue in this case, led her to conclude that the casings were all fired from the same firearm. She also explained that, in her evaluation, she “didn’t know which cartridge cases came from where. I just knew that there were two sets that were from potentially different locations, and that they just all needed to be inter-compared.” Clardy indicated that she conducted her investigation in the same manner, using the same techniques as the “350 to 400 examinations” that she had done for similar forensic investigations during her career. Clardy testified that her examination was

not rushed and that a peer reviewer looked over her examination results and concurred in her findings.

At the conclusion of the *voir dire*, the trial court ruled that “under Rule 702, the Court in its discretion finds . . . that [Clardy’s] testimony will be based upon sufficient facts and data,” “is the product of reliable principles and method[s],” and that Clardy “has applied these methods and principles to the facts of this particular case.” This decision was based on Clardy’s responses to extensive foundational and *voir dire* questioning. The trial court understood that some scholars have questioned the reliability of this sort of testimony, and the court weighed that against Clardy’s explanation of her principles and methods and her testimony about why she believed them to be reliable. The court’s determination that Clardy’s testimony satisfied Rule 702’s three-prong test, despite some evidence from Miller challenging the reliability of this type of expert testimony, was not arbitrary; it was a reasoned decision. *McGrady*, 368 N.C. at 893, 787 S.E.2d at 11; *State v. Griffin*, 268 N.C. App. 96, 108, 834 S.E.2d 435, 442 (2019).

“Under the abuse of discretion standard, our role is not to surmise whether we would have disagreed with the trial court, but instead to decide whether the trial court’s ruling was so arbitrary that it could not have been the result of a reasoned decision.” *McGrady*, 368 N.C. at 899, 787 S.E.2d at 15 (citation omitted). Because the trial court’s ruling was a reasoned decision, not an arbitrary one, we are bound to

conclude that the trial court did not abuse its discretion by overruling Miller's challenge to this expert testimony.

In any event, as with Miller's other evidentiary challenge, he cannot show prejudice. Error in the admission of expert testimony "is not prejudicial unless there is a reasonable possibility that, had the error in question not been committed, a different result would have been reached at trial." *State v. Babich*, 252 N.C. App. 165, 172, 797 S.E.2d 359, 364 (2017). For the reasons discussed above, there was overwhelming evidence of Miller's guilt even without this expert testimony—including Miller's possession and use of a rifle of the same caliber as the casings found at the crime scene, Miller's earlier threats to kill Charlene, and his spontaneous statements about "not having a rifle" and that "I wouldn't hurt my woman" when approached by law enforcement officers shortly after the shooting. Accordingly, even if we found error here—and we do not—the error is harmless.

Lastly, we address the dissenting opinion. That opinion is part of a trend in this Court to issue dissents that are not actually dissents and often more closely resemble editorials than judicial opinions. These purported dissents have become so commonplace that they are undermining a fundamental principle of our appellate process—that a dissent from a panel opinion of this Court creates a right to appeal to our Supreme Court. *See* N.C. Gen. Stat. § 7A-30(2). In several recent cases, our Supreme Court rejected an appeal of right based on a dissent after apparently

concluding that the dissent was not actually a dissent. *See Lippard v. Holleman*, 375 N.C. 492, 847 S.E.2d 882 (2020); *Sea Watch at Kure Beach Homeowners' Ass'n, Inc. v. Fiorentino*, 375 N.C. 502, 847 S.E.2d 415 (2020).

Here, too, this dissent is not a dissent, at least not in the traditional sense of an opinion disagreeing with the decision or judgment of the majority. *See, e.g.,* Opinion, Dissenting Opinion, *Black's Law Dictionary* (11th ed. 2019). Instead, our dissenting colleague would have made a different discretionary decision than the trial court and wants to explain why, although even the dissent agrees that, because any error was harmless, this issue has no impact on the outcome of this appeal. Put simply, this dissent is an effort to force our Supreme Court to confront a legal issue of interest to our dissenting colleague although the case otherwise would not meet the criteria for review in our State's high court.

Much of this purported dissent also reads more like a legal essay than an opinion. Our dissenting colleague thinks the science behind ballistic toolmark comparisons is of "questionably reliability" and thus would have excluded some of this expert's testimony. Fair enough—the dissent contains an accurate recitation of some scientific literature and reasonable jurists can reach different results in discretionary rulings. That is the nature of judicial discretion.

But importantly, appellate judges are not trial judges. We are no more qualified to evaluate a scientific issue than our colleagues in the trial division. And

under the abuse of discretion standard, appellate judges cannot substitute their judgment for that of the trial court; we examine only whether the trial court's ruling was "so arbitrary that it could not have been the result of a reasoned decision." *McGrady*, 368 N.C. at 899, 787 S.E.2d at 15. The trial court's decision here certainly was a reasoned one.

Finally, and equally important, this trend of editorial-like dissents and concurrences is not a one-way street. It can result in battling side opinions in successive cases that can make the law less clear, encouraging more legal disputes and more litigation.

This Court has long prided itself on its reputation as an apolitical "workhorse" court focused on correcting legal errors. The growing practice of expressing views about legal policy in dissenting opinions, to force issues upon our Supreme Court, threatens that reputation. This opinion explains the law; applies that law to a discretionary, fact-specific decision of the trial court in this case; concludes that the trial court acted well within its sound discretion; and, most importantly, holds that even if there was error, that error was harmless. That is, and ought to be, the end of the appropriate analysis for an intermediate appellate court and its judges.

III. Instruction on flight

Finally, Miller argues that the trial court erred by instructing the jury on flight. Miller contends that this instruction was not supported by the evidence. We

reject this argument.

A trial court must not “give instructions to the jury which are not supported by the evidence produced at the trial.” *State v. Cameron*, 284 N.C. 165, 171, 200 S.E.2d 186, 191 (1973). When a criminal defendant contends that a particular jury instruction was unsupported by the evidence, “we review the evidence and any reasonable inference from that evidence in the light most favorable to the State.” *State v. Chevallier*, 264 N.C. App. 204, 214, 824 S.E.2d 440, 449 (2019).

“A trial court may properly instruct on flight where there is some evidence in the record reasonably supporting the theory that the defendant fled after the commission of the crime charged.” *State v. Lloyd*, 354 N.C. 76, 119, 552 S.E.2d 596, 625 (2001). “However, [m]ere evidence that defendant left the scene of the crime is not enough to support an instruction on flight. There must also be some evidence that defendant took steps to avoid apprehension.” *Id.* Thus, the “relevant inquiry is whether the evidence shows that defendant left the scene of the crime and took steps to avoid apprehension.” *State v. Grooms*, 353 N.C. 50, 80, 540 S.E.2d 713, 732 (2000).

Importantly, if there is evidence in the record “reasonably supporting the theory that defendant fled after commission of the crime charged, the instruction is properly given. The fact that there may be other reasonable explanations for defendant’s conduct does not render the instruction improper.” *State v. Ethridge*, 168 N.C. App. 359, 362–63, 607 S.E.2d 325, 328 (2005), *aff’d*, 360 N.C. 359, 625 S.E.2d

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777 (2006). For example, in *State v. Shelly*, this Court held that “the trial court did not err in instructing the jury on flight” where the “evidence presented at trial established that Defendant left the scene of the shooting and did not return home,” but rather took “an action that was not part of Defendant’s normal pattern of behavior and could be viewed as a step to avoid apprehension.” 181 N.C. App. 196, 209, 638 S.E.2d 516, 525–26 (2007).

Here, as in *Shelly*, the evidence at trial showed that Miller left the scene of the shooting and did not return home or “to a place where, if necessary, law enforcement officers could find him.” *Id.* at 209, 638 S.E.2d at 526. Five hours after the shooting, an officer spotted Miller walking near a wooded area not far from the scene of the crime. Miller and the officer saw each other, and Miller raised and then lowered his hands before entering the wood line. Miller briefly entered the wood line then came back out and walked towards the officer. But when Miller was close enough to see the officer and make eye contact, he turned around and reentered the woods. A K-9 unit arrived to search for Miller in the woods and found Miller curled in a ball behind a large tree. Before the officers told him why they were looking for him, Miller made statements about not having a rifle and not hurting his wife. These statements indicate that Miller knew why the officers were interested in speaking to him.

Viewing this evidence in the light most favorable to the State and giving the State the benefit of all reasonable inferences, there was at least some evidence

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“reasonably supporting the theory that defendant fled after commission of the crime.” *Chevallier*, 264 N.C. App. at 214, 824 S.E.2d at 449; *Ethridge*, 168 N.C. App. at 362, 607 S.E.2d at 328. The evidence supports a reasonable inference that Miller knew law enforcement was looking for him in connection with the shooting and that, upon realizing that the officers intended to approach and speak to him, he entered a wooded area and hid behind a tree in an attempt to avoid apprehension. The fact that Miller has identified other innocent explanations for his conduct that day “does not render the instruction improper.” *Ethridge*, 168 N.C. App. at 363, 607 S.E.2d at 328. Accordingly, we hold that the trial court did not err in instructing the jury on flight.

Conclusion

For the reasons explained above, we find no plain error in part and no error in part in the trial court’s judgments.

NO PLAIN ERROR IN PART; NO ERROR IN PART.

Judge STROUD concurs.

Judge ZACHARY concurs in part and dissents in part with separate opinion.

ZACHARY, Judge, concurring in part, dissenting in part.

I fully concur in the majority opinion, except for its analysis under N.C. Gen. Stat. § 8C-1, Rule 702. Because I conclude that the trial court’s admission of testimony from the State’s expert in forensic firearms examination constituted an abuse of discretion, I respectfully dissent from the majority’s conclusion to the contrary.

With regard to the admission of expert witness testimony under Rule 702, the trial courts are tasked with “strik[ing] a balance between competing concerns since the testimony can be both powerful and quite misleading to a jury because of the difficulty in evaluating it.” *State v. McGrady*, 368 N.C. 880, 892, 787 S.E.2d 1, 10 (2016) (citation and internal quotation marks omitted). As the majority notes, in order to be admissible, the trial court must determine that the proposed expert testimony satisfies Rule 702(a)’s three-pronged reliability test: “(1) The testimony must be based upon sufficient facts or data. (2) The testimony must be the product of reliable principles and methods. (3) The witness must have applied the principles and methods reliably to the facts of the case.” *Id.* at 890, 787 S.E.2d at 9 (quoting N.C. Gen. Stat. § 8C-1, Rule 702(a)(1)–(3) (2015)). In this determination,

[t]he primary focus of the inquiry is on the reliability of the witness’s principles and methodology, not on the conclusions that they generate[.] However, conclusions and methodology are not entirely distinct from one another, and when a trial court concludes that there is simply too great an analytical gap between the data and the opinion proffered, the court is not required to admit opinion

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evidence that is connected to existing data only by the *ipse dixit* of the expert.

Id. (internal citations and quotation marks omitted).

Our Supreme Court has explained that the trial court has discretion in determining how to address Rule 702(a)'s three-pronged reliability inquiry, the precise nature of which "will vary from case to case depending on the nature of the proposed testimony." *Id.* In considering the reliability of proposed scientific testimony, the trial court may contemplate factors including:

(1) whether a theory or technique . . . can be (and has been) tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the theory or technique's known or potential rate of error; (4) the existence and maintenance of standards controlling the technique's operation; and (5) whether the theory or technique has achieved general acceptance in its field.

Id. at 890–91, 787 S.E.2d at 9 (citation and internal quotation marks omitted).

In the case at bar, Defendant challenges the reliability of the testimony of the State's expert witness in the field of firearm and toolmark identification. Specifically, Defendant emphasizes the lack of a known error rate for the field of firearm-identification analysis, especially in light of the inherent subjectivity of the matching method employed by examiners.

Firearm-identification analysis has existed as a forensic discipline for over a century. Indeed, in *Commonwealth v. Best*, 62 N.E. 748 (Mass. 1902), Justice Oliver Wendell Holmes, when serving as Chief Justice of the Supreme Judicial Court of

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Massachusetts, authored an opinion upholding the admission of ballistics evidence via expert testimony. However, the admissibility of firearm toolmark evidence has become increasingly controversial. *See, e.g.,* National Research Council, *Ballistic Imaging* 3 (2008) [hereinafter *Ballistic Imaging*].

Forensic firearm examination is, in essence, “the analysis of marks on bullets and cartridges.” National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 151 (2009) [hereinafter *Strengthening Forensic Science*]. A toolmark is a mark “generated when a hard object (tool) comes into contact with a relatively softer object,” such as the marks that result “when the internal parts of a firearm make contact with the [softer] brass and lead that comprise ammunition.” *Id.* at 150.

There are two types of toolmarks: class and individual. “Marks on the bullets and cartridges may be common to every firearm of that type (for example, the caliber of the firearm). These are called class characteristics. Alternately, marks may be specific to that particular firearm These are called individual characteristics.” Emily Nelson, *Firearm Identification*, Forensic Science Online, <https://www.forensicscienceonline.org/firearm-identification/> (last visited Oct. 6, 2020).

Examiners are trained “to identify the individual characteristics of microscopic toolmarks apart from class and subclass characteristics and then to assess the extent

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of agreement in individual characteristics in the two sets of toolmarks [that is, the subject projectile and the test fire] to permit the identification of an individual tool or firearm.” *Strengthening Forensic Science* at 153. By utilizing a method known as “pattern matching,” a qualified examiner decides whether the toolmarks produced by a gun on two bullets or cartridges are sufficiently similar as to justify the examiner’s conclusion that the same gun fired both projectiles. William A. Tobin & Peter J. Blau, *Hypothesis Testing of the Critical Underlying Premise of Discernible Uniqueness in Firearms-Toolmarks Forensic Practice*, 53 *Jurimetrics J.* 121, 123–24 (2013) [hereinafter *Hypothesis Testing*].

As our Supreme Court noted in its landmark *McGrady* decision, one factor that may bear upon the trial court’s assessment of whether an expert’s testimony is the product of reliable principles or methods, applied reliably to the facts, is the “known or potential rate of error” for the particular technique or method. *McGrady*, 368 N.C. at 891, 787 S.E.2d at 9; *see also id.* at 891, 787 S.E.2d at 10 (noting that “[t]he federal courts have articulated additional reliability factors that may be helpful in certain cases, including . . . [w]hether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give” (citation omitted)).

“Technique” or “method error” is error that is attributable to the inherent limitations of a method. Angi M. Christensen et al., *Error and its Meaning in Forensic Science*, 59 *J. Forensic Sci.* 123, 124 (2014) [hereinafter *Error and its Meaning*]. “The

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known rate of error produces a scientific measure of a method's validity, and that is likely why it was incorporated as part of the *Daubert* guidelines." *Id.*

In firearms analysis, for example, the rate of method error is strongly affected by the degree of variability or overlap of markings among individual guns. Joan Griffin & David J. LaMagna, *Daubert Challenges to Forensic Evidence: Ballistics Next on the Firing Line*, 26 *Champion* 20, 58 (2002) ("While there is still some variation due to manufacturing and individual wear patterns, variation due to manufacturing methods has been and continues to be minimized by modern manufacturing processes."); *cf.* *Strengthening Forensic Science* at 155 ("A fundamental problem with toolmark and firearms analysis is the lack of a precisely defined process."). Such limitations necessarily affect the method's probative value, and thus, an expert's ability to provide testimony establishing the reliability of the method under Rule 702. Methods with low error rates exhibit high validity, and vice versa. *See* John Song et al., *Estimating Error Rates for Firearm Evidence Identifications in Forensic Science*, 284 *Forensic Sci. Int'l* 15, 28–29 (2018) ("Because of the inherent variability of the firing process, we do not expect evidence from firearms to exhibit the extremely low error rates that are characteristic of DNA evidence.").

Here, the State's expert testified, both on voir dire examination and on cross examination before the jury, that there is no established error rate for the field as a whole, but that her *personal* error rate was "zero percent." She also testified that

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firearms can leave “unique” toolmarks similar to fingerprints. Finally, the expert witness testified, without “any doubt[]” as to her opinion, that all eight of the cartridge casings—which were recovered from two separate locations—were fired by the same unknown gun.

This testimony may have been misleading to the jury. First, while individual characteristic toolmarks do not appear in an entirely random manner, neither have they been scientifically established as “unique” to a particular firearm. *See Ballistic Imaging* at 3 (“A significant amount of research would be needed to scientifically determine the degree to which firearms-related toolmarks are unique or even to quantitatively characterize the probability of uniqueness.”). “The notion of uniqueness in forensic science is probabilistic and impossible to prove in a scientific sense, and this form of logic follows inductive reasoning.” *Error and its Meaning* at 125.

Moreover, practitioner error differs from method error: despite this expert’s stated proficiency, a lack of information regarding the frequency of the occurrence of certain toolmarks on firearms projectiles would prevent *any* firearms analyst from claiming a zero-error rate.¹ *See Hypothesis Testing* at 123–24. More importantly, for

¹ Even DNA analysis has a non-zero error rate. Jessica Gabel Cino, *Tackling Technical Debt: Managing Advances in DNA Technology that Outpace the Evolution of Law*, 54 Am. Crim. L. Rev. 373, 383 (2017); *see also Error and its Meaning* at 125 (“[T]here is always a nonzero probability of error, and to claim an error rate of zero is inherently unscientific.”).

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the expert to offer her opinion to this level of certainty—without any basis for doing so—risks misleading the jurors as to the appropriate weight and confidence to accord the expert’s testimony or the weight to a declared match. *Cf.* Simon A. Cole, *More than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. Crim. L. & Criminology 985, 1049 (2005) (“The potential to mislead a fact-finder by saying, ‘My methodological error rate is zero, and my practitioner error rate is negligible,’ is extremely high.”).

“A rule governing the admission of expert testimony necessarily strikes a balance between competing concerns since the testimony can be both powerful and quite misleading to a jury because of the difficulty in evaluating it.” *McGrady*, 368 N.C. at 892, 787 S.E.2d at 10 (citation and internal quotation marks omitted). Nonetheless, the trial court possesses the authority to determine whether, and to what extent, a proposed expert’s testimony would be of value at trial:

Whether expert testimony is admissible under Rule 702(a) is a preliminary question that a trial judge decides pursuant to Rule 104(a). In answering this preliminary question, the trial judge is not bound by the rules of evidence except those with respect to privileges. To the extent that factual findings are necessary to answer this question, the trial judge acts as the trier of fact. The court must find these facts by the greater weight of the evidence. As with other findings of fact, these findings will be binding on appeal unless there is no evidence to support them.

Id. at 892–93, 787 S.E.2d at 10–11 (internal citations and quotation marks omitted).

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But Rule 702(a) “does not mandate particular procedural requirements for exercising the trial court’s gatekeeping function over expert testimony.” *Id.* at 893, 787 S.E.2d at 11 (citation and internal quotation marks omitted). “The trial court has the discretion to determine ‘whether or when special briefing or other proceedings are needed to investigate reliability.’ ” *Id.* (quoting *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152, 143 L. Ed. 2d 238, 252–53 (1999)).

For example,

[a] trial court may elect to order submission of affidavits, hear voir dire testimony, or conduct an *in limine* hearing. More complex or novel areas of expertise may require one or more of these procedures. In simpler cases, however, the area of testimony may be sufficiently common or easily understood that the testimony’s foundation can be laid with a few questions in the presence of the jury.

Id. (internal citations omitted). Whatever the circumstances require, the trial “court should use a procedure that . . . will secure fairness in administration, elimination of unjustifiable expense and delay, and promotion of growth and development of the law of evidence to the end that the truth may be ascertained and proceedings justly determined.” *Id.* (citation and internal quotation marks omitted).

In the case *sub judice*, the trial court’s gatekeeping authority included the power to determine the appropriate scope of the firearm-identification expert’s opinion, most notably with regard to the degree of certitude that the witness was permitted to express.

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Before the jury, the State's expert testified as follows concerning the lack of a known error rate in the field of firearm identification, generally:

[DEFENSE COUNSEL:] Well, in firearm and tool mark identification, is it fair to say that the error rate is not zero?

[MS. CLARDY:] We actually don't know what the error rate is in firearms identification. That is something that's currently being investigated by science. There's many, many different studies that are being run currently, and have been run in the past, about what a true error rate for our discipline would be.

The expert then specified that “[w]e don't currently have an error rate within our discipline, but . . . our error rate is measured on an individual basis. And how we do that is through proficiency testing. . . . And my personal error rate I do know, which is zero percent.”

The State's expert essentially opined, then, that her individual examinations are *more* reliable than those of her field as a whole, given that “the error rate . . . in firearms investigation . . . [is] currently being investigated by science.” This testimony “likely . . . shrouded [her opinion] with an aura of near infallibility.” *State v. Ward*, 364 N.C. 133, 146, 694 S.E.2d 738, 746 (2010) (citation and internal quotation marks omitted).

It is the trial court's duty to “strike[] a balance between” allowing testimony that will assist the jury and exercising its gatekeeping authority to exclude testimony that “can be both powerful and quite misleading to a jury because of the difficulty in evaluating it.” *McGrady*, 368 N.C. at 892, 787 S.E.2d at 10 (citation and quotation

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marks omitted). And as Justice Scalia observed in his concurrence to *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 143 L. Ed. 2d 238 (1999), the trial court's authority to select the manner for investigating an expert's reliability under Rule 702

is not discretion to abandon the gatekeeping function. . . . [I]t is not discretion to perform the function inadequately. Rather, it is discretion to choose among *reasonable* means of excluding expertise that is *fausse* and science that is junky. Though . . . the *Daubert* factors are not holy writ, in a particular case the failure to apply one or another of them may be unreasonable, and hence an abuse of discretion.

Kumho, 526 U.S. at 158–59, 143 L. Ed. 2d at 256–57 (Scalia, J., concurring).

By permitting the State's expert to opine that her personal error rate was "zero percent" without any testimony regarding the general error rate in the field, the trial court failed to exercise its gatekeeping authority and, in doing so, admitted testimony of questionable reliability. For these reasons, I conclude that the trial court abused its discretion by admitting testimony from the State's expert in forensic firearms examination.

I respectfully dissent.