

IN THE SUPREME COURT OF TENNESSEE
AT KNOXVILLE
October 5, 2001 Session
Heard at Gallatin¹

STATE OF TENNESSEE v. JOHN R. FARNER, JR.

**Appeal by permission from the Court of Criminal Appeals
Criminal Court for Sullivan County
No. 40,003 R. Jerry Beck, Judge**

No. E1999-00491-SC-R11-CD - Filed December 11, 2001

The primary issue presented in this appeal is whether Tennessee law recognizes a co-perpetrator rule which bars the defendant's convictions for criminally negligent homicide on the basis that the victims were co-participants in the drag race. After fully and carefully considering the record in this case in light of the relevant authorities, we conclude that no rule of Tennessee law bars the defendant's convictions for criminally negligent homicide as a matter of law. We hold that causation in criminal cases generally is a question of fact for a properly instructed jury, that a victim's contributory negligence is not a complete defense but may be considered in determining whether or not the defendant's conduct was a proximate cause of death, and that a jury's determination of the causation issue will be reviewed on appeal under the familiar sufficiency of the evidence standard and not disturbed so long as the evidence is sufficient to support the jury's determination. Because the trial court in this case failed to provide the jury with an instruction on proximate causation, an essential element of the offense, and because the jury was erroneously provided an instruction as to criminal responsibility, a theory that the State now concedes is inapplicable, the defendant's convictions for criminally negligent homicide must be reversed.

To prevent needless litigation and to promote judicial economy, we exercise our discretion and address two other issues which will likely arise at any retrial – the propriety of Officer Farmer testifying as an expert and the admissibility of the computer animated visualization of the accident. We conclude that Officer Farmer may properly testify as an expert so long as the trial court is assured that Officer Farmer's opinions are based on relevant scientific methods, processes, and data, and not upon mere speculation. However, we further conclude that the computer animated visualization should not be admitted unless the State can establish that the visualization is based on accurate and complete information and that it fairly illustrates the expert opinion of Officer Farmer as to how the accident occurred. The convictions for criminally negligent homicide are therefore reversed; the convictions for reckless endangerment with a deadly weapon, drag racing, and leaving

¹This case was heard as part of the October 5, 2001, S.C.A.L.E.S. (Supreme Court Advancing Legal Education for Students) project in Gallatin, Sumner County, Tennessee.

the scene of an accident involving injury or death are affirmed. The judgment of the Court of Criminal Appeals is affirmed in part, reversed in part, and the case is remanded to the trial court for further proceedings consistent with this opinion.

**Tenn. R. App. P. 11; Judgment of the Court of Criminal Appeals Affirmed in Part;
Reversed in Part; Case Remanded to the Trial Court**

FRANK F. DROWOTA, III, C.J., delivered the opinion of the court, in which E. RILEY ANDERSON, ADOLPHO A. BIRCH, JR., JANICE M. HOLDER and WILLIAM M. BARKER, JJ., joined.

R. Wayne Culbertson, Richard A. Spivey, and Timothy Reid Wilderson, Kingsport, Tennessee, for the appellant, John R. Farner, Jr..

Paul G. Summers, Attorney General & Reporter; Michael Moore, Solicitor General; Patricia C. Kussmann, Assistant Attorney General; H. Greeley Wells, District Attorney General; and Teresa Murray-Smith, Assistant District Attorney General, for the appellee, State of Tennessee.

OPINION

Background

This case arose from a drag race between the defendant, John R. Farner, Jr., who was driving his red Chevrolet Camaro, and the victim, Landon Baker, who was driving his white Mitsubishi 3000 GT. The race, which occurred between 9:30 and 10:00 p.m. on March 20, 1997, began at a Coastal Mart in the Colonial Heights neighborhood just south of Kingsport, Tennessee. From the Coastal Mart, the defendant and Baker raced northbound toward Kingsport on Fort Henry Drive, a four lane highway, for a distance of 3,432 feet, approximately six and one-half tenths of a mile. The race ended when Baker lost control of his Mitsubishi in a curve and collided with two other vehicles traveling toward Johnson City, in the southbound, oncoming lanes of Fort Henry Drive, a Chrysler minivan and a green Volvo. Baker, and his passenger, Christopher Bostrum, died as a result of the collision. The persons driving the other vehicles, Teresa Gilliam and Priscilla Redwine, sustained serious injuries. The defendant's car was not physically involved in the collision. However, the defendant, and his alleged passenger, Steven Moore, were each charged with two counts of vehicular homicide, two counts of aggravated assault, one count of drag racing, and one count of leaving the scene of an accident knowing that it involved death.

The case proceeded to trial on these charges. At the close of the State's proof, the trial court entered a directed verdict in favor of Moore. With respect to Farner, the proof offered by the State established that he instigated the drag race. Prior to Baker's arrival at the Coastal Mart, the defendant had asked Holly Harris, who was driving a Camaro, when they were going to race. Harris responded, "Yeah, right." As soon as Baker arrived, Harris overheard the defendant ask

Baker when he wanted to “run them.”² Baker merely shook his head from side to side. When the defendant left the Coastal Mart a short time later, he drove from the parking lot onto Colonial Heights Road, stopped in the road, and revved his engine. Intending to leave by the same exit, Baker waited for the defendant to pull up to the traffic light at the intersection of Colonial Heights Road and Fort Henry Drive. However, the defendant remained in the middle of the road some distance from the intersection, revving his engine. Eventually, Baker pulled onto Colonial Heights Road ahead of the defendant and stopped at the red light, before turning right onto Fort Henry Drive. The defendant immediately followed Baker, not yielding for oncoming traffic.

Tracy Shipley, who was driving north toward Kingsport on Fort Henry Drive, approached the intersection and saw a red Camaro with tinted side windows turn onto Fort Henry Drive immediately behind a white car. Shipley said a Toyota pickup truck, approximately two car lengths ahead of him in the right lane,³ had to swerve into the left lane to avoid hitting the red Camaro. The cars then accelerated out of sight, but Shipley saw them again when he rounded a curve, going side by side across the railroad trestle, with the red Camaro in the left, inside lane, and the white car in the right, outside lane. Shipley estimated the cars were traveling in excess of seventy miles per hour, and he did not see brake lights on either car. As Shipley stopped at the Roadrunner Market near the railroad trestle, he heard a noise, which he believed was made by the shifting of a ladder on the back of his truck, but a worker in the market commented that the two cars had wrecked. Shipley arrived at the scene of the accident two to three minutes after leaving the market. He saw a red Camaro sitting astride the white, dotted line, facing south, in the direction of Johnson City. Someone jumped into the passenger side of the red Camaro, and it then made a U-turn and drove north toward Kingsport at a high rate of speed. The car had tinted side windows, but Shipley could not identify the person who jumped into the car nor could he say for sure that the red Camaro was the same car he had seen earlier.

Kregg Klingman, driving southbound on Fort Henry Drive toward Johnson City, was south of the Texaco when he heard loud revving engines and saw two cars, side by side, going northbound on Fort Henry Drive, toward Kingsport. Klingman estimated the vehicles were traveling approximately eighty miles per hour, but he was unable to see the make, model, or color of the cars. Although Klingman saw the cars disappear around the curve in his rearview mirror, he did not recall seeing brake lights on either car.

Elizabeth Reynolds, who worked at the Texaco service station on the corner of Fort Henry Drive and Moreland Drive, was outside shortly before 10 p.m. on March 20, 1997 when

²About 3 a.m., following the accident, the defendant paged Harris. Although Harris did not recognize the telephone number, she realized it was the defendant calling because the number “03” appeared at the end of the page. The defendant previously had told Harris he would use “03” to identify himself if he paged her, explaining that he is a Dale Earnhardt fan. When Harris returned the defendant’s call, she asked if he and Baker had been racing. The defendant replied, “No, not really. He took off and left me before I got to the Texaco.” The defendant denied seeing the collision, explaining that he had seen only objects in the road and did not stop because he was scared.

³The record indicates that police efforts to locate the driver of this Toyota truck were unsuccessful.

she heard the roar of car engines and two cars traveling north toward Kingsport at a speed in excess of 100 miles per hour. Although she could not determine the make or model of the cars, Reynolds said the red car was in the left, inside lane, and the white car was in the right, outside lane. Neither car applied its brakes as the cars disappeared around the curve. Reynolds almost immediately heard a loud boom, and believing the vehicles had wrecked, she called for emergency assistance.

Anthony Bowman was stopped at a traffic light at the intersection of Moreland Drive and Fort Henry Drive, headed south, when he heard loud revving engines. He saw two vehicles approaching from the opposite direction, “neck and neck,” at a very high rate of speed, at least seventy to seventy-five miles per hour. Bowman said the car in the left, inside lane near him was red.

Brian Bishop and Stanley Hodges, detectives with the Second Judicial Drug Task Force, were parked near the intersection of Moreland Drive and Fort Henry Drive shortly before 10 p.m. when they heard the sound of vehicles approaching at a high rate of speed from the Colonial Heights area, heading toward Kingsport. Officer Bishop did not see the cars, but Officer Hodges saw a red car in the left, inside lane, pass through the intersection, at approximately eighty-five miles per hour. “Almost immediately” after the red car passed the officers heard the sound of skidding and a collision. Both officers called for emergency assistance, reported the accident, and proceeded to the scene. They searched the area for the red car, using a flashlight to look over the side of the guardrail. Officer Hodges directed traffic at the scene for two hours but did not see the red car return. However, he said the red car could have returned without his notice within the first five minutes after the accident occurred because he was then attending the injured and traffic had not yet become congested.

Michael Taylor was driving south, intending to turn left at the intersection of Moreland Drive and Fort Henry Drive, when he saw a white car and a red Camaro traveling toward him at a high rate of speed. Taylor veered to the right, and he said the wind from the cars shook his van as they drove past. Looking in his rearview mirror, Taylor saw sparks and brake lights from both vehicles and almost immediately heard a loud pop. Taylor turned around, drove to the scene of the accident, called for emergency assistance, and advised police to be looking for a red car. Taylor was the only witness to place the white car in the left, inside lane and the red car in the right, outside lane.

Neither Teresa Gilliam, driver of the Chrysler Minivan, nor Priscillia Redwine, driver of the green Volvo, remembered any details about the collision. Gilliam remembered driving south on Fort Henry Drive toward Hammond Bridge, but her next memory was being inside an ambulance. Redwine said she had just crossed Hammond Bridge when something to the left attracted her attention. She remembered then seeing what appeared to be a white bullet heading toward her. Her air bag deployed, and she was covered with glass and blood. Noticing an unusual smell and fearing a fire, Redwine got out of the car.

Gilliam, who sustained multiple injuries in the collision including, multiple broken bones in her left leg and foot, a splintered right femur and crushed right foot, heel, and ankle, a broken left elbow, and a laceration on her head, spent three weeks in the hospital, and received physical therapy in her home for two months thereafter. At trial, Gilliam was still using a crutch to walk and undergoing physical therapy. Gilliam's prognosis as to further treatment or improvement was uncertain. Redwine suffered lacerations on her head and left arm, bruises on her arm and leg, embedded glass in her hand, and burns on her face from the air bag deployment. Her hands are permanently scarred from the injuries she sustained.

Officer Robert Dale Farmer of the Kingsport Police Department testified as an expert in accident reconstruction. He was dispatched to the accident on Fort Henry Drive around 9:50 p.m. and arrived at the scene at 10:16 p.m. The vehicles involved in the collision had not been moved. Redwine's green Volvo with extensive front-end damage was resting against the guardrail on the southbound shoulder of the road. Gilliam's Chrysler minivan was sitting crosswise in the southbound lanes facing the guardrail on the southbound shoulder. Part of the white Mitsubishi was located against the guardrail on the southbound shoulder of the roadway. Another part of the Mitsubishi was upside down in the left southbound lane.

Officer Farmer testified that the collision occurred near the intersection of Fort Henry Drive and Moreland Drive, north of the railroad bridge that travels underneath Fort Henry Drive. This location is 3,432 feet, or approximately six and one-half tenths of a mile, from where the drag race began. Officer Farmer located the point of impact by following yaw marks from their beginning to where they ended with a gouge mark in the asphalt. Officer Farmer explained that yaw marks are caused by a car sliding sideways while the wheels continue to rotate forward. In this case, the yaw marks began just before the railroad bridge and continued for 544 feet, ten inches. Officer Farmer opined that these marks establish that the Mitsubishi traveled from the right northbound lane of Fort Henry Drive, across the left northbound lane, striking Gilliam's Chrysler minivan in the left southbound lane and Redwine's green Volvo in the right southbound lane. The impact of the Mitsubishi's collision with the Chrysler minivan caused a gouge mark in the pavement. At that point, the front wheels and engine compartment of the Mitsubishi split from the passenger and rear portion of the car. The rear portion became airborne, rotated, and struck the Volvo. From the white paint on the Volvo and the parts of the Mitsubishi found lying across the Volvo's front bumper, Officer Farmer determined that the Mitsubishi initially struck the Volvo with its left rear undercarriage. The passenger compartment and rear of the Mitsubishi landed on the southbound guardrail behind the Volvo. The front wheels and engine compartment of the Mitsubishi came to rest upside down in the left southbound lane.

Officer Farmer said that Fort Henry Drive curves to the left at the railroad bridge and that the speed limit where the accident occurred is 45 miles per hour. Officer Farmer calculated the

speed of the Mitsubishi at 95.45 miles per hour when it began to yaw,⁴ and he determined that the Mitsubishi was traveling 64.11 mile per hour when it struck the Chrysler minivan. He explained that a car's speed decreases during a yaw and that the Mitsubishi's speed decreased by 31 miles per hour during the 544 foot yaw, even though the evidence indicated that none of the cars involved in the collision applied their brakes.

Officer Farmer testified that the critical speed of a curve is the maximum speed any vehicle, regardless of make, model, or year, can successfully traverse a curve in a particular lane. Officer Farmer calculated the critical speed of the right lane of the curve in which the Mitsubishi was traveling when it began to yaw is 73.88 miles per hour.⁵ Officer Farmer did not calculate the critical speed of the left lane of the curve in which the defendant's car was allegedly traveling, and he conceded that the critical speed would be different but said it "would not vary a tremendous amount." Because of the absence of roadway evidence, Officer Farmer did not calculate the speed of the defendant's car or of the vehicles with which the Mitsubishi collided.

Shortly after beginning the investigation, Officer Farmer directed Kingsport police officers to locate the defendant. Although Detective Ralph Cline spent the rest of the night and the early morning hours of March 21, 1997, searching, he was not able to locate the defendant or the red Camaro. The defendant surrendered himself to the police at his lawyer's office the following afternoon at 5:30 p.m. There, Officer Farmer inspected the defendant's car but found no evidence indicating the defendant's car had been physically involved in the collision.

Officer Farmer gave a copy of his completed accident report and photographs of the area and the accident scene to Professor Robert Neal Owen, director of the Advanced Visualization Laboratory at East Tennessee State University. Professor Owen testified by stipulation as an expert in computer visualization. He described computer animated visualization as a way of telling a story by creating a "copy of reality" with a computer. Professor Owen explained that a computer animated visualization differs from a computer simulation in that an animated visualization utilizes the testimony of an expert to recreate the event, and as such, is an

⁴Officer Farmer calculated this speed by locating the point at which the rear tires began tracking to the outside of the front tires, determined the radius of the yaw, subtracted half of the track width of the car from the radius to determine the speed of the center mass of the car, and entered these calculations, along with a drag factor or coefficient of friction which he had computed by using a drag sled, into a speed formula that he obtained from the Institute of Police Technology in Florida as part of his training in accident reconstruction. Officer Farmer testified that the formula had been applied to accident investigations for several years, appeared in many instructional manuals that are used in police training in accident reconstruction, and had been commonly used throughout the United States to determine speed. Officer Farmer used this same procedure to calculate the speed at which the Mitsubishi was traveling when it collided with the Chrysler minivan.

⁵Officer Farmer calculated this speed by first measuring the chord, which is a straight line between the two ends of the yaw mark, then calculating the middle ordinate, which is the distance from the center of the chord to the end of the yaw mark. He used the middle ordinate to calculate the circumference, and he calculated the coefficient of friction or drag factor of the road with an instrument called a drag sled. From all this information, Officer Farmer calculated the critical speed of the curve.

illustration of the expert's testimony and opinion, while a simulation utilizes a computer to apply the laws of physics, and as such, purports to be an exact duplication of the event. Professor Owen's laboratory had not previously created a computer animated visualization of an automobile accident, but he said the creation process is similar, regardless of the event depicted. Professor Owen used information provided by Officer Farmer to create this animated visualization, including the make and model of the vehicles, the speeds at which they were traveling, the physical characteristics of the roadway, such as size, shape and slope, and the locations of the vehicles after the collision.

Because Officer Farmer's accident report stated that the cars were side by side at the beginning of the railroad bridge, the animation shows the Camaro slightly in front of the Mitsubishi at the beginning of the visualization. Professor Owen explained that, because the Camaro had to be traveling slower than the Mitsubishi when it entered the curve to avoid a collision, the Camaro had to be slightly ahead of the Mitsubishi at the beginning of the visualization to be located beside the Mitsubishi at the railroad bridge. The animation shows the Camaro traveling the curve at or below 73.88 miles per hour, which Professor Owen described as the critical speed of the curve. Professor Owen was not aware that Officer Farmer had not calculated the critical speed of the curve for the lane in which the Camaro was traveling, but he opined, that, if the critical speed of the two lanes differed only by one or two miles per hour, the accuracy of the animated visualization would not be significantly affected.

The trial court admitted the computer animated visualization and the State played the tape for the jury. The animated visualization portrayed the collision at three different speeds – full speed, one-half speed, and one-quarter speed – and from five different viewpoints – that of an overview and those of the Camaro, the Mitsubishi, the Chrysler minivan, and the Volvo. In all, the video contained fifteen visualizations of the collision. Briefly summarized, the visualization shows the Camaro in the left northbound lane traveling slightly ahead of the Mitsubishi which is traveling in the right northbound lane. The Mitsubishi accelerates slightly, continues through the curve, pulls even with the Camaro, which appears to slow down slightly at the beginning of the railroad bridge. The Mitsubishi then begins to yaw near the end of the bridge, causing it to turn sideways toward the southbound lanes. The Camaro continues through the curve in the left northbound lane, accelerating out of the curve ahead of and just before the Mitsubishi yaws across the left northbound lane and into the left southbound lane. The passenger side of the Mitsubishi strikes the front of the Chrysler minivan, and the front portion of the Mitsubishi splits from the rest of the car. The passenger compartment and rear portion of the Mitsubishi becomes airborne and rotates, striking the front of the Volvo in the southbound right lane. The visualization ends with the Mitsubishi striking the Volvo and the Camaro continuing in the northbound left lane as the accident occurs behind it.

Based upon this proof, the jury convicted the defendant of two counts of criminally negligent homicide, two counts of reckless endangerment with a deadly weapon, one count of

drag racing, and one count of leaving the scene of an accident involving death or injury.⁶ The trial court sentenced the defendant as a Range I standard offender to two years on each count of criminally negligent homicide and to two years on each count of reckless endangerment. The trial court ordered the sentences on the felonies served consecutively, with concurrent sentences for the misdemeanor offenses of drag racing and leaving the scene of an accident involving injury or death, for an effective sentence of eight years.

The defendant challenged his convictions and sentences on appeal, raising numerous issues. Finding that double jeopardy considerations preclude dual convictions for reckless endangerment under the circumstances of this case, the Court of Criminal Appeals vacated one of the defendant's convictions for reckless endangerment and thereby reduced his effective sentence to six years. While finding that the trial court erred in admitting the computer-generated visualization, the Court of Criminal Appeals nonetheless concluded that the error was harmless beyond a reasonable doubt and did not require reversal. The Court of Criminal Appeals affirmed the judgment of the trial court in all other respects and specifically rejected the defendant's assertion that Tennessee law recognizes a co-perpetrator rule which precludes his convictions for criminally negligent homicide.

The defendant sought permission to appeal to this Court, asserting, among other things, that his convictions were barred by the co-perpetrator rule, that the trial court erred in allowing Officer Farmer to testify as an expert, and that the trial court's error in admitting the computer animated visualization requires reversal. We granted the application for permission to appeal, and without preventing the parties from raising additional issues pursuant to Tenn. R. App. P. 13(a), specifically requested that the parties focus at oral argument upon the following issue: Can the defendant be held criminally responsible for the death of co-perpetrators?

For the following reasons, we reverse the defendant's convictions for criminally negligent homicide and remand this case for a new trial on those charges. At the new trial, Officer Farmer may testify as an expert so long as the trial court is satisfied that Officer Farmer's opinions are based on relevant scientific methods, processes, and data, and not upon mere speculation. The trial court should not admit the computer animated visualization at the new trial unless the State can establish that the visualization is based on accurate and complete information and that it fairly illustrates Officer Farmer's expert opinion of how the accident occurred. In all other respects, the decision of the Court of Criminal Appeals is affirmed.

⁶With respect to counts one and two of the indictment, the trial court instructed the jury as to vehicular homicide and the lesser offenses of reckless homicide and criminally negligent homicide. The jury convicted the defendant of the least serious offense, criminally negligent homicide. With respect to counts three and four of the indictment, the trial court instructed the jury as to intentional and reckless aggravated assault, reckless endangerment with a deadly weapon, and reckless endangerment. The jury convicted the defendant of reckless endangerment with a deadly weapon. With respect to count five, the trial court instructed the jury as to drag racing only, and the jury convicted the defendant of this offense. With respect to count six, the trial court instructed the jury with respect to leaving the scene of an accident knowing death resulted from the accident and leaving the scene of an accident involving injury or death. The jury convicted the defendant of the less serious offense.

Criminally Negligent Homicide: Co-Perpetrator Rule

Historically, involuntary manslaughter was proscribed by the laws of this State and defined as the unlawful killing of another, without express or implied malice, that occurs in the commission of some unlawful act. See State v. Davis, 798 S.W.2d 268, 270-71 (Tenn. Crim. App. 1990). Generally, any violation of a statute resulting in death constituted involuntary manslaughter “if the violation of the statute [was] the proximate cause of death.” See State v. Hale, 840 S.W.2d 307, 314 (Tenn. 1992) (stating the rule); Brown v. State, 201 Tenn. 50, 53, 296 S.W.2d 848, 849 (1956) (applying the rule to uphold a conviction for involuntary manslaughter where a passenger in the defendant’s car was killed in a collision which occurred when the defendant violated a statute by improperly passing a car at the crest of a hill); Osborne v. State, 512 S.W.2d 612, 618 (Tenn. Crim. App. 1974)(stating the rule).

When the General Assembly enacted the Criminal Sentencing Reform Act of 1989, involuntary manslaughter was replaced by the offense of criminally negligent homicide. See Sentencing Commission Comments to Tenn. Code Ann. § 39-13-212; State v. Adams, 916 S.W.2d 471,473-74 (Tenn. 1995). The General Assembly supplied a simple definition for this offense. “Criminally negligent conduct which results in death constitutes criminally negligent homicide.” Tenn. Code Ann. § 39-13-212(a). To establish this offense, the plain language of the statute requires the State to prove three essential elements beyond a reasonable doubt: (1) “criminally negligent conduct” on the part of the accused; (2) that proximately causes (“which results in”); (3) a person’s “death.” Tenn. Code Ann. § 39-13-212(a); See also Adams, 916 S.W.2d at 474; State v. Owens, 820 S.W.2d 757, 760 (Tenn. Crim. App. 1991). Criminal negligence is further defined by statute as follows:

a person . . . acts with criminal negligence with respect to the circumstances surrounding that person’s conduct or the result of that conduct when the person ought to be aware of a substantial and unjustifiable risk that the circumstances exist or the result will occur. The risk must be of such a nature and degree that the failure to perceive it constitutes a gross deviation from the standard of care that an ordinary person would exercise under all the circumstances as viewed from the accused person’s standpoint

Tenn. Code Ann. § 39-11-106(a)(4); see also State v. Clifton, 880 S.W.2d 737, 742-43 (Tenn. Crim. App. 1994); State v. Butler, 880 S.W.2d 395, 397 (Tenn. Crim. App. 1994) (discussing this definition).

Having set out the elements of the offense of which the defendant stands convicted, we turn to the defendant’s first argument on appeal – that Tennessee law precludes his conviction of this offense because the victims were co-perpetrators in the underlying crime of drag racing. As support for his assertion, the defendant primarily relies upon State v. Severs, 759 S.W.2d 935 (Tenn. Crim. App. 1988).

In Severs, the issue was whether the trial court should have dismissed the charge of felony murder because the victim of the attempted larceny, rather than the defendant, killed the defendant's co-perpetrator. The Court of Criminal Appeals found that the trial court had erred in refusing to dismiss the charge of felony murder. The intermediate court recognized that, to support a conviction for felony murder at common law, "the killing must have been in pursuance of, rather than collateral to," the underlying felony. Severs, 759 S.W.2d at 938. The court in Severs emphasized that the felony murder statute in Tennessee adopted this common law formulation of the rule by requiring that the murder be "in the 'perpetration' or 'attempted perpetration'" of the underlying felony. Id. The intermediate court concluded that the circumstances in Severs failed to satisfy the "in perpetration" requirement because "the death resulted from an effort to thwart rather than to perpetrate the felony." Id. The Court of Criminal Appeals commented that "[a]ny extension of the meaning of the statute to the current facts would be in derogation of the common law definition of felony-murder." Id. The Severs court observed "that an extension of the felony murder rule beyond its common law limitation to acts by the felon and his accomplice, to include the lethal actions of those not acting in pursuance of the felonious scheme, is an appropriate action for the legislature . . . not the courts." Id.

Clearly, the Severs decision is an interpretation and application of the felony murder rule in Tennessee. It does not announce a generally applicable co-perpetrator rule as the defendant suggests. Recently, in State v. Buggs, 995 S.W.2d 102, 106 (Tenn. 1999), this Court discussed the felony murder rule and reaffirmed that, to constitute felony murder, the killing must be "in pursuance of" the underlying felony offense. As support for the decision in Buggs, this Court relied upon Severs. See Buggs, 995 S.W.2d at 106. Decisions narrowly interpreting the felony murder rule, like Buggs and Severs, acknowledge that the felony murder rule "is a legal fiction in which the intent and the malice to commit the underlying felony is 'transferred' to elevate an unintentional killing to first-degree murder." Buggs, 995 S.W.2d at 107; See also State v. Pierce, 23 S.W.3d 289, 296 (Tenn. 2000). The rationale which underlies these decisions does not apply either directly or by analogy in this case. Criminally negligent homicide is not first degree murder. It is instead the least serious homicide offense recognized by the laws of this State, and there is no justification for applying to this offense a principle that was developed to limit the extension of a doctrine that elevates unintentional killings to first degree murder. The Severs decision applies only in the context of felony murder, and, as the Court of Criminal Appeals recognized, is completely unrelated to the crime of criminally negligent homicide.

Moreover, our research has revealed no other statutory support for the defendant's assertion that Tennessee law includes a co-perpetrator rule which bars his convictions for criminally negligent homicide. Neither the language of the statute defining the offense, nor the language of any other statute mandates recognition of such a rule. "The power to define what shall constitute a criminal offense and to assess punishment for a particular crime is vested in the legislature." State v. Burdin, 924 S.W.2d 82, 87 (Tenn. 1996); Hale, 840 S.W.2d at 314; Hunter v. State, 496 S.W.2d 900, 902-03 (Tenn.1972); Jones v. Haynes, 221 Tenn. 50, 53-54, 424 S.W.2d 197, 198, (Tenn. 1968); Woods v. State, 130 Tenn. 100, 106-07, 169 S. W. 558, 559-60 (1914). Indeed, the court in Severs refused to extend the felony murder rule beyond its common

law reach because of its recognition that such an extension is solely within the authority of the legislature, not the courts. Likewise, in the absence of statutory authority, we decline to adopt a co-perpetrator rule as the defendant suggests.

By relying upon the co-perpetrator rule, the defendant is essentially urging that the negligence of a victim co-participant in a drag race is a complete defense if the victim's negligent conduct is a proximate cause of the victim's death. The Court of Criminal Appeals recognized that some state courts have accepted this argument and have refused to imposed criminal liability upon a defendant for the death of a co-participant in a drag race. See Velazquez v. State, 561 So. 2d 347 (Fla. Dist. Ct. App. 1990) (refusing to uphold the defendant's conviction for vehicular homicide for the death of his co-competitor in a drag race and stating that the victim's death was caused by his own conduct rather than the defendant's participation in the drag race); Thacker v. State, 117 S.E.2d 913 (Ga. Ct. App. 1961) (dismissing an indictment for involuntary manslaughter on the basis that the indictment failed to allege that the defendant caused the death of his co-competitor in a drag race and stating that the victim's conduct in losing control of his car was the independent cause of his death); State v. Peterson, 526 P.2d 1008 (Or. 1974) (adopting the dissenting opinion of an intermediate appellate court judge which reversed the defendant's conviction for manslaughter upon finding that the defendant's conduct did not cause the death of the victim, a passenger in the vehicle of the defendant's co-competitor in a drag race, because the victim was a "knowing and voluntary participant" in the reckless conduct); Commonwealth v. Root, 170 A.2d 310, 314 (Pa. 1961) (reversing the defendant's conviction of involuntary manslaughter on the basis that the defendant's conduct "was not a sufficiently direct cause of the competing driver's death to make him criminally liable therefore").

However, as the Court of Criminal Appeals recognized, the better-reasoned cases reject this approach and uphold homicide convictions when the victim is a co-participant in a drag race. These courts have emphasized that the central causation issue is a matter for a jury's determination, that the victim's negligence is not a complete defense but may be considered in determining whether the defendant's conduct is a proximate cause of the victim's death, and that a jury's determination of causation should not be disturbed on review by an appellate court unless the evidence is not sufficient to support the finding.

For example, in State v. Melcher, 487 P.2d 3 (Ariz. Ct. App. 1971), a jury convicted the defendant of six counts of vehicular manslaughter. The deaths occurred when the automobile with which the defendant was racing collided with a third vehicle, killing the co-competitor in the drag race and five persons in the third vehicle. The trial court granted the defendant a new trial, but the Arizona Court of Appeals reversed and reinstated the jury's verdict. In so doing, the Arizona Court rejected the defendant's argument that he could not be found guilty because his car did not collide with the other vehicle, stating "[i]t is obvious that the defendant can be criminally responsible for the death of the other racing party . . . if the racing was the proximate cause of that other party's death." Id. at 162.

In State v. McFadden, 320 N.W.2d 608 (Iowa 1982), the defendant was convicted of two counts of involuntary manslaughter. His convictions arose from a drag race in which the motorist racing the defendant lost control of his car and struck a third vehicle. A passenger in the third vehicle and the defendant's co-competitor died as a result of the collision. The defendant argued that the evidence was insufficient to establish causation since his car was not physically involved in the collision. The Iowa Supreme Court rejected this argument, stating:

Viewing the evidence in the light most favorable to the State, we hold that the record contains substantial evidence that defendant's participation in a drag race with [the victim] was a concurring proximate cause of the accident

McFadden, 320 N.W.2d at 617.

Likewise, in State v. Plaspohl, 157 N.E.2d 579 (Ind. 1959), the trial court directed a verdict in favor of the defendant on the basis that the victim, a passenger in the defendant's car during the race, was an active participant in the unlawful act which resulted in his death, and under the law, he had assumed the risk of the result. The Indiana Supreme Court reversed, relying upon the following general rule:

Contributory negligence is not available as a defense or an excuse in a criminal prosecution; this doctrine has no place in criminal law, and it cannot in any degree purge an act which otherwise constitutes a public offense of its criminal character. Accordingly, the contributory negligence of a person injured or killed by the criminal negligence of another does not relieve the latter from criminal responsibility.

Id. at 580. The Court explained that this rule is supported by the "great weight of authority in other jurisdictions"⁷ and is founded upon the following premise:

It is a basic concept of our society that the life of every man is both divinely and humanly significant. Every death upon the highway is more than a statistic. It is a tragedy which affects not only the individual and his family, but all of society. And if death results from the reckless use of the highway, the fact that the deceased joined in the reckless activity does not negate the fact of the death, nor does it assuage the loss to the family of the deceased or the community.

Reckless homicide is a crime committed against the state. Therefore, contrary to the rule in civil cases, the fact that the deceased victim was 'an active participant in the unlawful act which resulted in his death,' . . . does not bar an action against another for the wrong which he has committed against the peace and dignity of the state.

⁷Id. at 581, n.2 (citing cases).

Id. at 580-81.

In Goldring v. State, 654 A.2d 939 (Md. Ct. Spec. App. 1995), the defendant was convicted of three counts of involuntary manslaughter. The deaths resulted when the defendant's competitor in a drag race lost control of his car, struck and killed two bystanders, and then died himself from the collision. The defendant's car was not physically involved in the collision. In rejecting the defendant's claim that a participant in a drag race may not be held criminally liable for the death of a co-participant, the Maryland court stated:

we hold that [the defendant's] conduct in competing in the drag race bore a sufficiently direct causal connection to [the co-participant's] death to support [the defendant's] conviction for involuntary manslaughter

Id. at 944. In so holding, the Maryland court also pointed out that the victim's reckless conduct does not relieve the defendant of criminal liability for his own reckless conduct. Id. See also People v. Hansen 68 Cal. Rptr. 2d 897 (Cal. Ct. App. 1997) (upholding the defendant's conviction for involuntary manslaughter upon finding that the defendant participated in a game of Russian Roulette with the victim who was killed during the game); Commonwealth v. Atencio, 189 N.E.2d 223 (Mass. 1963) (upholding the defendant's conviction for manslaughter arising out of his participation in a game of Russian Roulette).⁸

The general principles upon which these courts relied in permitting a jury to decide whether criminal liability should be imposed upon a defendant for the death of his co-participant in a drag race are reflected in and consistent with Tennessee law. For example, in Cole v. State, 512 S.W.2d 598 (Tenn. Crim. App. 1974), the defendants, brothers Raymond Cole and Paul Cole, Jr., were racing, when Raymond's automobile collided with a third vehicle during the race, killing the driver. Both Raymond and Paul were convicted as principal offenders of involuntary manslaughter, even though the car driven by Paul was not physically involved in the collision. The Court of Criminal Appeals upheld the convictions, stating that the jury was justified in believing that the victim's death was the "natural or probable consequence" of the defendants' conduct in operating their motor vehicles in such a reckless and unlawful manner on the public highways. Id. at 601.

⁸See also Coffelt v. State, 307 N.E.2d 497, 500 (Ind. Ct. App. 1974) (stating that the contributory negligence of a victim is not a defense to involuntary manslaughter but will exonerate the defendant if the victim's negligence was the sole cause of his or her own death); State v. Chastain, 960 P.2d 756, 761 (Kan. 1998) (stating that contributory negligence of a victim is no defense in a criminal case but is a circumstance which the jury may consider in determining whether the defendant's conduct was or was not a proximate cause of the victim's death); People v. Tims, 534 N.W.2d 675, 681 n. 6 (Mich. 1995) (citing cases which hold that a victim's contributory negligence is not a defense but is a factor to consider in determining whether the defendant's conduct caused the victim's death and describing this rule as "universal" among the states); People v. Moore, 631 N.W.2d 779, 781-82 (Mich. Ct. App. 2001) (stating that the negligence of a victim in failing to wear seatbelts and using marijuana was not a complete defense but could be considered in determining whether the defendant's conduct caused death).

The decision in Cole illustrates that proximate cause, an essential element of criminally negligent homicide,⁹ is generally established in Tennessee by showing that the victim's death was the natural and probable result of the defendant's unlawful conduct. See e.g. State v. Barnes, 703 S.W.2d 611, 614-15 (Tenn. 1985); State v. Randolph, 679 S.W.2d 943, 947-48 (Tenn. 1984); Fine v. State, 193 Tenn. 422, 429, 246 S.W.2d 70, 73 (Tenn. 1952); Letner v. State, 156 Tenn. 68, 75-76, 299 S. W. 1049, 1051 (1927); Copeland v. State, 154 Tenn. 7, 12, 285 S. W. 565, 566 (1926); Odeneal v. State, 128 Tenn. 60, 69, 157 S. W. 419, 420 (1913); State v. Richardson, 995 S.W.2d 119, 125 (Tenn. Crim. App. 1998); State v. Grose, 982 S.W.2d 349, 352 (Tenn. Crim. App. 1997). The defendant's unlawful act or omission need not be the sole or immediate cause of the victim's death. Letner, 156 Tenn. at 76, 299 S. W. at 1051. "[H]e is responsible if the direct cause results naturally from his conduct. The same is true if the direct cause is an act of the deceased himself reasonably due to defendant's unlawful conduct." Id. (emphasis added).¹⁰ This concept was reaffirmed in Fine:

the act of the deceased, resulting in his death (not being corporally injured by the defendant), must have been the natural and probable consequence of the unlawful conduct of [the defendant].

193 Tenn. at 429, 246 S. W. at 73.¹¹ Finally, a victim's contributory negligence does not relieve a defendant of criminal liability for his or her own criminally negligent conduct. See, e.g., Gentry v. State, 184 Tenn. 299, 305, 198 S.W.2d 643, 646 (Tenn. 1947)(holding that the trial court did not err in charging the jury that the victim's contributory negligence in driving while intoxicated did not relieve the defendant of his guilt of involuntary manslaughter where the defendant's automobile caused the collision that killed the victim). However, a victim's contributory negligence may be considered in determining whether, under the circumstances, the defendant's criminally negligent conduct was a proximate cause of death, or whether the victim's conduct was an independent, intervening cause of death. See Copeland, 154 Tenn. at 11, 285 S. W. at 566.

In accordance with these well-settled principles of Tennessee law, we decline to adopt a broad co-perpetrator rule which precludes imposition of criminal liability upon a defendant for the death of a co-participant in a drag race. Consistent with the well-reasoned decisions from

⁹See Adams, 916 S.W.2d at 474; Owens, 820 S.W.2d at 760.

¹⁰See Delawder v. Commonwealth, 196 S.E.2d 913, 915 (Va. 1973) (stating that an intervening act which is reasonably foreseeable does not break the causal connection and holding that the conduct of the defendant and his co-competitor in a drag race concurrently caused the victim's death, even though the co-competitor struck the defendant's car, causing him to lose control and hit the victim).

¹¹Contrary to the defendant's argument, there is no "wounding" requirement in Tennessee law, as this quotation well illustrates. While most homicides are caused when a defendant mortally wounds, or in the words of Fine, corporally injures, the victim, not all homicides are caused in this fashion and there is no legal requirement of a wounding. The legally required element is causation.

Arizona, Iowa, Indiana, and Maryland, we conclude that causation in criminal cases generally is a question of fact for a properly instructed jury, that a victim's contributory negligence is not a complete defense but may be considered in determining whether or not the defendant's conduct was a proximate cause of death, and that a jury's determination of the causation issue will be reviewed under the familiar sufficiency of the evidence standard and will not be disturbed by an appellate court so long as the evidence is sufficient to support the jury's determination.

We recognize that, while causation is an essential element of every homicide offense, including criminally negligent homicide,¹² it is not seriously disputed in most cases. See Wayne R. LaFave and Austin W. Scott, Jr., Substantive Criminal Law, § 3.12 (a) (1986) ("In the usual case there is no difficulty in showing the necessary causal connection between conduct and result."). However, this is one of those rare cases in which causation was seriously and forcefully disputed at trial and on appeal by the defendant's reliance upon the co-perpetrator rule. ("It is the unusual case—numerically in the minority, yet arising often enough to warrant considerable attention by the courts—which gives difficulty in the area of causation. Id.).

While the evidence is legally sufficient to support a jury's finding that the defendant's conduct proximately caused Baker and Bostrum's deaths, the jury in this case was not given an instruction on proximate cause. It is well-settled in Tennessee that a defendant has a right to a correct and complete charge of the law so that each issue of fact raised by the evidence will be submitted to the jury on proper instructions. See State v. Garrison, 40 S.W.3d 426, 432 (Tenn. 2000); State v. Teel, 793 S.W.2d 236, 249 (Tenn. 1990). While harmless error analysis applies when a trial court fails to include an instruction on an essential element of the offense, id., we are unable to conclude that the error is harmless in this case. As stated, this issue was forcefully disputed at trial. Closing argument focused upon this element.¹⁴ Both the State and the defendant exhorted the jury to listen to the law given by the trial judge. However, the jury instruction on criminally negligent homicide did not mention proximate cause.¹⁵ Given the

¹²See Rogers, 992 S.W.2d 393; Tenn. Code Ann. § 39-13-212(a) ("which results in").

¹⁴For example, the State urged: "Look at the law the Judge gives you. Look at that. Proximate cause, proximate result of conduct. What else are those two deaths and those injuries but the proximate result of John Farner's conduct starting this race." In final closing argument, the district attorney again asserted: "What was the proximate result or a proximate cause of this accident. The proximate cause was this gentleman right here, the defendant, agreeing to, consenting to and taking part in that drag race. Had he not done it, we wouldn't be here today."

The defendant's closing argument urged: "Ladies and gentlemen, John Farner does not deny to you that he was speeding that night. He does not deny to you that if you choose to call it a drag race, that's what it was, okay?" "Now ladies and gentlemen, she talks about proximate cause of things, proximate cause. In a sense, that is the crux of this case. Proximate cause. . . . And that's the whole issue in this case is causation and proximate cause, ladies and gentlemen. That's what you're going to have to, you're going to have to consider. . . . Proximate cause, causation, who caused the accident, that's the thing you're going to have to look at."

¹⁵As to vehicular homicide, the jury was instructed that to find the defendant guilty, they had to find "that the
(continued...)

particular circumstances of this case, the trial court's failure to instruct on proximate cause, standing alone, would most likely have been viewed as plain error requiring reversal. Cf. State v. Howard, 30 S.W.3d 271 (Tenn. 2000) (reversing the defendant's conviction because the trial court failed to instruct on the natural and probable consequences rule). Reversal clearly is appropriate, however, since the record also reveals another instructional error.

The trial court instructed the jury as to criminal responsibility with respect to the criminally negligent homicide charges. As the defendant asserts, and the State concedes on appeal,¹⁶ the defendant cannot be found guilty pursuant to the criminal responsibility statute because the victims did not commit homicide upon themselves. We agree. Certainly, one cannot be convicted pursuant to a theory of criminal responsibility if there is no other person who is guilty of the crime as a principal. See Pierce v. State, 130 Tenn. 24, 46, 168 S.W.851, 856 (1914). Accordingly, the trial court erred by instructing the jury as to criminal responsibility with respect to the criminally negligent homicide offenses.

Had the only error in this case been this improper instruction on criminal responsibility, we may well have been able to conclude, as the State argues, that the error was harmless because the evidence sufficiently establishes that Farner's criminally negligent conduct in drag racing on a public highway directly and proximately caused the victims' deaths. However, as previously stated, the jury was not properly instructed on proximate cause, the only element of the homicide offense seriously disputed at trial. Accordingly, given the particular circumstances of this case, we are unable to conclude that the instructional errors are harmless.

In all fairness, we recognize that the instruction given by the trial court on criminally negligent homicide was taken verbatim from Tennessee Pattern Jury Instruction: Criminal § 7.07, which does not mention proximate cause.¹³ While the pattern instructions contain a general

¹⁵(...continued)

_____ killing was the proximate result of conduct creating a substantial risk of death or serious bodily injury to a person." The jury was further instructed that proximate result is "a result, which is the natural and continuous sequence, . . . a product of an act occurring or concurring with another, which, had it not happened, the result would not have occurred." The jury did not convict the defendant of vehicular homicide, and no similar instructions were given as to criminally negligent homicide, nor was the jury referred to the instructions on proximate result previously given.

¹⁶In its brief the State concedes that the trial court should not have given a criminal responsibility instruction with respect to the charges of criminally negligent homicide, stating, "Obviously neither Baker nor Bostrum committed the offense of homicide with respect to his own death." The State asserts that the criminal responsibility instruction was appropriate and logically related to the reckless endangerment charges against Farner which arose from the injuries sustained by Redwine and Gilliam. The State asserts that the evidence is sufficient to support the jury's verdict as to these offenses on either a theory of direct responsibility or on a theory of criminal responsibility for Baker's actions. The Court of Criminal Appeals agreed that the evidence is sufficient in this regard, and we affirm that portion of the judgment of the Court of Criminal Appeals.

¹³Significantly, the pre-1989 pattern jury instruction for involuntary manslaughter correctly instructed the jury that to establish guilt, the state had to prove as one of the three elements of the offense "that death was the natural and
(continued...)

instruction on cause of death,¹⁵ there is no cross-reference in the criminally negligent homicide instruction indicating that the general causation instruction should be given. Unless the pattern instruction for each homicide offense includes a causation instruction, the general causation instruction should be given. In the vast majority of cases, causation is not disputed, so omitting this instruction would be considered harmless error. However, the fact remains that causation is an element of every homicide offense, and the jury should be so instructed.¹⁶ In this case, the trial court failed to instruct the jury as to causation, and the error was not harmless. Therefore, the defendant's convictions for criminally negligent homicide are reversed, and the case is remanded for a new trial on these charges.

In order to prevent needless litigation and to promote judicial economy, we exercise our discretion and address two other issues which will likely arise at any retrial – the propriety of Officer Farmer testifying as an expert and the admissibility of the computer animated visualization of the accident. See Tenn. R. App. P. 13(b) (“[t]he appellate court . . . may in its

¹³(...continued)

probable result of the defendant's act.” Tenn. Pattern Instructions: Crim. § 20.06 (1988).

¹⁵See Tenn. Pattern Instructions: Crim. § 42.14 (2001).

¹⁶The current pattern instruction on causation appears to have been drawn from the leading cases on the subject, but many of those cases date back to the early 1900's, so the language certainly could be clarified. We recommend that the Commission consider supplementing the current causation instruction with the following or similar language:

Before the defendant can be convicted of any degree of homicide, the State must have proven beyond a reasonable doubt that the death of the deceased was proximately caused by the criminal conduct of the defendant.

The proximate cause of a death is that cause which, in natural and continuous sequence, unbroken by any independent intervening cause, produces the death and without which the death would not have occurred.

The defendant's conduct need not be the sole or immediate cause of death. The acts [or omissions] of two or more persons may work concurrently to proximately cause the death, and in such a case, each of the participating acts [or omissions] is regarded as a proximate cause. It is not a defense that the negligent conduct of the deceased may also have been a proximate cause of the death.

However, it is a defense to homicide if the proof shows that the death was caused by an independent intervening act [or omission] of the deceased or another which the defendant, in the exercise of ordinary care, could not reasonably have anticipated as likely to happen. However, if, in the exercise of ordinary care, the defendant should reasonably have anticipated the intervening cause, that cause does not supersede the defendant's original conduct, and the defendant's conduct is considered the proximate cause of death. It is not necessary that the sequence of events or the particular injury be foreseeable. It is only necessary that the death fall within the general field of danger which the defendant should have reasonably anticipated.

See 11 Wash. Pattern Jury Instructions: Criminal §§ 25.02 & 25.03 (2d ed. 1994); State v. Perez-Cervantes, 6 P.3d 1160, 1163 (Wash. 2000); State v. Harris, 230 N.W.2d 203, 207 (Neb. 1975).

discretion consider other issues in order, among other reasons: (1) to prevent needless litigation, (2) to prevent injury to the interests of the public, and (3) to prevent prejudice to the judicial process.”); see State v. Mixon, 983 S.W.2d 661, 673 (Tenn. 1999).

Expert Testimony

The defendant’s primary argument is that Officer Farmer did not have sufficient knowledge of science, engineering, and math to qualify to testify as an expert witness. The defendant points out that Officer Farmer has no college degree in any of these fields. While it is not necessary to recount specifics, we note that Officer Farmer testified extensively about his prior experience as a police officer investigating automobile accidents and about his training as an accident reconstructionist. Officer Farmer admitted that he did not have a college degree and that he had not taken geometry or physics in high school, but he emphasized that he had taken three separate eighty hour courses in accident reconstruction and had learned the needed mathematics and physics in these courses. He explained in detail the many factors he considers in investigating an accident, including, the debris field, the point of impact, skid marks or yaw marks on the roadway, eyewitness accounts of the accident, the angle of impact of the collision, the position of the vehicles at the scene, the direction the vehicles were traveling, and the vehicle having the right of way. Using a critical speed yaw, he calculates an adjusted radius and using a drag sled, he calculates the coefficient of friction of the roadway. Officer Farmer testified that he uses these calculations in conjunction with a speed formula to determine a vehicle’s speed. Officer Farmer testified that he obtained this speed formula from the Institute of Police Technology in Florida, that it also appears in many other accident reconstruction training manuals, and that it is commonly used throughout the United States. See note 4, supra.

At trial, the defendant did not object to the reliability of the speed formula or to Officer Farmer’s understanding and explanation of the scientific basis of the formula. The defendant attempted to raise this issue on appeal, but the Court of Criminal Appeals held that, in the absence of a specific objection, the trial court did not err in allowing Officer Farmer to testify based upon the formula. The Court of Criminal Appeals recognized that, had an objection been interposed, the trial court would have required Officer Farmer to testify more specifically about his understanding of the scientific basis of the formula. The Court of Criminal Appeals noted that Officer Farmer testified about the reliability of the formula when he said that it is derived from the Institute of Police Technology in Florida, that it appears in many accident reconstruction training manuals, that it is commonly used throughout the United States, and that he had checked calculations made with the speed formula against radar measurements of actual speed, finding the formula calculations to be accurate.

In general, questions regarding the admissibility, qualifications, relevancy and competency of expert testimony are entrusted to the discretion of the trial court. McDaniel v. CSX Trans., Inc., 955 S.W.2d 257, 263 (Tenn. 1997). Tennessee Rules of Evidence 702 and 703 govern the trial court’s exercise of discretion in this area and provide, respectively:

If scientific, technical, or other specialized knowledge will substantially assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise.

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence. The court shall disallow testimony in the form of an opinion or inference if the underlying facts or data indicate lack of trustworthiness.

While these rules require trial courts to “analyze the science and not merely the qualifications, demeanor or conclusions of experts, the court need not weigh or choose between two legitimate but conflicting scientific views. The court instead must assure itself that the opinions are based on relevant scientific methods, processes, and data, and not upon an expert’s mere speculation.” McDaniel, 955 S.W.2d at 265. The trial court’s determination is one of admissibility only. Id. Once the evidence has been admitted, the defense is given broad latitude to test the validity of the expert’s opinion on cross examination. Id. See also Tenn. R. Evid. 705. The weight to be given the scientific expert evidence and the resolution of legitimate competing scientific views are matters entrusted to the jury as the trier of fact. McDaniel, 955 S.W.2d at 265.

Applying these rules to the facts of this case, we conclude that the trial court did not abuse its discretion in allowing Officer Farmer to testify as an expert in accident reconstruction. Officer Farmer testified about his knowledge, skill, experience, and training in the field. Contrary to the defendant’s assertions at trial, the rules do not mandate that a person have a college degree in order to testify as an expert. Education is only one of the qualifying criteria listed in Rule 702. Officer Farmer testified about the reliability and general usage of the speed formula that he employed in this case. In the absence of a specific objection, the trial court did not err in failing to require Officer Farmer to testify in more detail about the scientific basis and validity of the formula. At the new trial, the defendant will have an opportunity to test the validity of the formula before the trial court determines admissibility. So long as the trial court is assured that Officer Farmer’s opinions are based on relevant scientific methods, processes, and data, and not upon mere speculation, the trial court should admit the evidence. McDaniel, 955 S.W.2d at 265. Of course, if the evidence is admitted, the defendant will have the opportunity to test Officer Farmer’s methods and conclusions on cross-examination.

Computer Animated Visualization

Because it will also no doubt be an issue at any new trial, we consider the admissibility of the computer animated visualization. Computer generated evidence is an increasingly common form of demonstrative evidence. Barbara E. Bergman and Nancy Hollander, 3 Wharton’s Criminal Evidence, § 16:30 at 972 (15th ed. 1999) (“Wharton’s”). If the purpose of the computer

evidence is to illustrate and explain a witness's testimony, courts usually refer to the evidence as an animation. See Kristin L. Fulcher, Comment, The Jury as Witness: Forensic Computer Animation Transports Jurors to the Scene of a Crime or Automobile Accident, 22 U. Dayton L. Rev. 55, 58 (1996); See, e. g., Pierce v. State, 718 So. 2d 806, 808 (Fla. Ct. App. 1997). In contrast, a simulation is based on scientific or physical principles and data entered into a computer, which is programmed to analyze the data and draw a conclusion from it, and courts generally require proof to show the validity of the science before the simulation evidence is admitted. Id.; see also Clark v. Cantrell, 529 S.E.2d 528, 535 n.2 (S.C. 2000).

The record clearly reveals that the computer evidence admitted in this case is properly classified as an animation, rather than a simulation. The evidence was admitted to explain and illustrate Officer Farmer's testimony about how the accident occurred.¹⁷ At the risk of stating the obvious, we note that a computer animation offered to illustrate an expert's opinion will not be admissible unless the expert testimony is itself admissible pursuant to McDaniel and the applicable Tennessee Rules of Evidence. See Pierce, 718 So.2d at 809.

The proponent must further establish that the computer animation is a fair and accurate depiction of the event it purports to portray. See Tenn. R. Evid. 901; State v. Williams, 913 S.W.2d 462, 466 (Tenn. 1996); Phillips v. F.W. Woolworth, Co., 867 S.W.2d 316, 318 (Tenn. Ct. App. 1992); see also Wharton's at 973; Pierce, 718 So.2d at 809; Cleveland v. Bryant, 512 S.E.2d 360, 362 (Ga. Ct. App. 1999); Hutchison v. American Family Mut. Ins. Co., 514 N.W.2d 882, 890 (Iowa 1994); Gosser v. Commonwealth, 31 S.W.3d 897, 903 (Ky. 2000); State v. Harvey, 649 So. 2d 783, 789 (La. Ct. App. 1995); People v. McHugh, 476 N.Y.S.2d 721, 722 (N.Y. Sup. Ct. 1984); Clark, 529 S.E.2d at 536; Sommervold v. Grevlos, 518 N.W.2d 733, 737-38 (S.D. 1994); Mintun v. State, 966 P.2d 954, 959 (Wyo. 1998).

Because the jury may be so persuaded by its life-like nature that it becomes unable to visualize an opposing or differing version of the event, the requirement that the animation fairly and accurately portray the event is particularly important when the evidence at issue is a computer animated recreation of an event. See, e.g. State v. Trahan, 576 So. 2d 1, 8 (La. 1990)(discussing a motion picture and stating "[t]he vivid impressions on the trier of fact created by the viewing of the motion pictures will be particularly difficult to limit. . . ."); Clark, 529 S.E.2d at 536 (recognizing that if the portrayal is inaccurate, computer animations pose a high potential to mislead the jury and to create lasting impressions that unduly override other evidence); Sommervold, 518 N.W.2d at 737 (stating that because a video reconstruction has a substantial impact on the jury which will tend to view it as true, to be admissible, such reconstructions must be "nearly identical" to the actual event); Hinkle v. City of Clarksburg, 81 F.3d 416, 424-25 (4th Cir. 1996) (stating that because of its unusual persuasive value, to be admissible, a computer animated visualization must be substantially similar to the actual event).

¹⁷ We do not now decide the admissibility standards applicable to computer simulations offered as substantive evidence. As a result, we have not included in our discussion cases involving simulations.

Like all evidence in Tennessee, a computer animation is subject to exclusion if “its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.” See Tenn. R. Evid. 403; See also Pierce, 718 So. 2d at 809 (Fla. Ct. App. 1997); Gosser, 31 S.W.3d at 903; Clark, 529 S.E.2d at 536; Sommervold, 518 N.W.2d at 737. If a computer animated portrayal is inaccurate, its probative value decreases and the likelihood that it will be subject to exclusion under Rule 403 increases. Like other evidence, the admissibility of computer animations generally rests within the sound discretion of the trial court, with the rules of evidence governing the exercise of the trial court’s discretion.

Applying these rules to the facts in this record, we conclude that the trial court abused its discretion in admitting the computer animated visualization in this case because it is not a fair and accurate portrayal of the event depicted, and as a result, its probative value was substantially outweighed by the danger of unfair prejudice.

Although Officer Farmer was unable to make a determination as to the speed of the defendant’s Camaro, the computer animation includes the Camaro and depicts it at various speeds throughout the animation. For example, at the beginning of the animation, the Camaro is depicted traveling ahead of the Mitsubishi. Later, the Mitsubishi overtakes the Camaro, and just before the collision occurs, the animation shows the Camaro accelerating through the curve and passing the Mitsubishi. Professor Owen testified that the Camaro was depicted at the critical speed of 73.88 miles per hour.

The depiction of the Camaro ahead of the Mitsubishi at the beginning of the animation is inconsistent with the proof. The eyewitness testimony consistently described the cars as side-by-side. Officer Farmer did not dispute or elaborate on these descriptions. Professor Owen indicated that he did not base this portion of the depiction upon specific evidence, but he said the cars must have been in this position to have later been side-by-side as described by the eyewitnesses. However, Professor Owen was not qualified as an accident reconstructionist and should not have based the animation upon his own assumptions, opinions, or conclusions. The depiction is also inconsistent with Officer Farmer’s testimony conceding that he had not determined the critical speed for the lane in which the defendant was traveling. While Officer Farmer opined that it probably would not vary a tremendous amount, he testified that the critical speed for the defendant’s lane of travel definitely would not have been 73.88 miles per hour. Therefore, the animation is inaccurate in its depiction of the Camaro traveling at 73.88 miles per hour. In addition, the animation’s depiction of the Camaro accelerating out of the curve is not supported by the evidence, and in fact, seems to be inconsistent with Officer Farmer’s testimony about the critical speed at which a vehicle could safely negotiate the curve. Finally, it is not clear what speed the animation uses to depict the Chrysler minivan and the Volvo since there is no evidence in the record indicating the speed of these vehicles prior to impact.

Given that the computer animated visualization is based upon inaccurate and incomplete information, we conclude that the trial court erred in admitting it at trial. We also note that the

animation depicted the accident a total of fifteen times at various speeds. While we set no limit on how many times a visualization may depict an event, we emphasize that trial judges must carefully monitor such evidence and prevent cumulative presentation if it poses a substantial risk of unfairly prejudicing the defendant. See Tenn. R. Evid. 403 and Tenn. R. Evid. 611. As previously stated, animations generally have a substantial impact upon jurors, and that impact is no doubt increased where jurors are allowed to view the animated visualization not once or twice, but fifteen separate times.

For all these reasons, we conclude that the trial court erred in admitting the computer animated visualization. We emphasize, however, that the State may again seek admission of the computer animated visualization at the new trial. Of course, as a prerequisite to admissibility, the State must establish that the animation has been corrected to fairly and accurately illustrate and explain the testimony of Officer Farmer. The trial court should be guided by the principles discussed in this opinion when deciding whether to permit the introduction of the computer animated visualization. We commend the trial court for clearly instructing the jury that the animation is not itself evidence and was offered only to illustrate the testimony of the expert witness. Such an instruction is appropriate whenever computer animation evidence is admitted.

Conclusion

For the reasons stated herein, the defendant's convictions for criminally negligent homicide are vacated and the case remanded for a new trial on these charges. At the new trial, Officer Farmer may testify as an expert so long as the trial court is satisfied that Officer Farmer's opinions are based on relevant scientific methods, processes, and data, and not upon mere speculation. However, the computer animated visualization of the accident is not admissible unless the State first establishes that it has been corrected to accurately and fairly illustrate Officer Farmer's testimony. The trial court's decision on admissibility shall be guided by the principles discussed herein. The defendant's convictions for reckless endangerment with a deadly weapon, drag racing, and leaving the scene of an accident involving injury or death are affirmed. Costs of this appeal are taxed to the State of Tennessee, for which execution may issue if necessary.

FRANK F. DROWOTA, III, CHIEF JUSTICE