

IN THE COURT OF CRIMINAL APPEALS OF TENNESSEE
AT NASHVILLE
FEBRUARY SESSION, 1997

FILED

September 30, 1997

Cecil W. Crowson
Appellate Court Clerk

STATE OF TENNESSEE,)
)
 Appellee)
)
 vs.)
)
 JOHN ALLEN CHAPMAN,)
)
 Appellant)
)

No. 01C01-9604-CC-00137

GRUNDY COUNTY

Hon. THOMAS W. GRAHAM, Judge

(First Degree Murder; Aggravated
Kidnapping; Aggravated Sexual
Battery)

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OPINION FILED: _____

AFFIRMED

David G. Hayes
Judge

OPINION

The appellant, John Allen Chapman, appeals from the April 2, 1994, Grundy County jury verdict finding him guilty of first degree murder, aggravated kidnapping, and aggravated sexual battery. The jury fixed the appellant's sentence at life imprisonment for first degree murder and the trial court imposed maximum sentences of twelve years each for the remaining offenses and ordered all sentences to be served consecutively. On appeal, the appellant challenges:

- I. The sufficiency of the indictment charging aggravated kidnapping;
- II. The sufficiency of the evidence for all three convictions;
- III. The admission of DNA evidence;
- IV. Denial of the appellant's motion to suppress blood samples obtained during the investigation;
- V. Failure of the trial court to properly instruct the jury regarding identity;
- VI. The scope of cross-examination of State's witnesses; and
- VII. Sentencing: length of sentences and imposition of consecutive sentences.

After review, the judgment of the trial court is affirmed.

BACKGROUND

Guilt Phase

On April 19, 1990, Michelle Blake, the victim in this case, was employed as a clerk at the Pit Stop South, a gas and convenience store in McMinnville. Mrs. Blake was twenty-six years old, married and the mother of a four-year-old daughter. On this date, she was scheduled to work the 3:00 p.m. to 11:00 p.m.

shift. At 5:15 p.m., Mrs. Blake's husband, William Blake, arrived at the Pit Stop South to pick up the couple's vehicle, a Ford Bobcat. He left the business, traveled to a video store, and then went home. As was customary, Blake was to return to the Pit Stop later that evening with his wife's dinner.

Around 8:30 p.m., Ed Martin stopped at the store to purchase gasoline. Martin pumped three dollars worth of gasoline and went inside the store to pay. As Martin was leaving the store, Mrs. Blake remarked, "I wish he'd go ahead and leave. I've already pumped his gas," referring to a man sitting outside the front of the store in an older model gray Chevrolet pick up truck which displayed Grundy County license plates.

Fifteen minutes later, around 8:45 p.m., Sylvia Fults and her husband pulled into the drive-through window of the Pit Stop South to purchase cigarettes. Although she depressed the customer assistance button, no clerk appeared. She then noticed Mrs. Blake at the full service pump with a jug in her hand. Mrs. Blake re-entered the store to wait on Fults. While waiting on Fults, Mrs. Blake

talked about this guy being there before getting gas and talking about him being so weird. She said he had been there earlier and got gas in his truck and he had left or started to leave, and came back and had her put gas in a can, and she said, 'Now he's back wanting it in a jug.'

Mrs. Blake also told Fults that this man had asked her if she had wanted any help since she was at the store by herself. During this conversation, Fults noticed a man in the store who looked like he was trying to scare Mrs. Blake. When she was leaving the parking lot, she observed a "gray primer color" pick up truck with chrome parked in front of the store.

Mary Jones lives across the street from the Pit Stop South. Around 8:55

p.m. on April 19, 1990, she heard what she thought to be a scream coming from the front of her house. After hearing an apparent second scream, she went to her front porch where she observed a truck on the Pit Stop's parking lot. She stated that the truck was a "gray primer color" and had a Chevrolet logo across the back of the tailgate. She noticed a man and a woman in the truck. Ms. Jones related that "at one time it looked like she pulled away from him." She assumed that, more than likely, it was simply a "domestic problem." The truck then pulled out of the parking lot and onto Highway 55. She commented that, as the truck left the parking lot, it was going very fast and that it made loud sounds.

At 9:05 p.m., as planned, William Blake returned to the Pit Stop South with his wife's, dinner. When he arrived at the Pit Stop, he noticed two vehicles in the parking lot. Two customers approached him and inquired as to "what was going on" as there was no attendant on duty. Immediately, Blake began to search the premises for his wife. During this search, one of the customers discovered Mrs. Blake's eyeglasses in the parking lot. At this point, the police were called and the owner of the station, Mr. Stanton, arrived. After inspecting the premises, Mr. Stanton stated that no money had been taken from the cash register, although the key that functioned as the "on-off" switch was missing. A search then began in Warren County for Michelle Blake.

Joe Roper informed law enforcement officials that, while traveling home on the evening of April 19, 1990, on route 108, a vehicle came up behind him at an excessive rate of speed and passed him on a double yellow line. He described the vehicle as being a gray Chevrolet pick up truck with large tires and Grundy County license plates. Roper also stated that there were two people in the truck. Dale Winton reported that, at 9:05 p.m., he was traveling on highway 127 when a vehicle came up behind him "real fast" and swerved around him,

almost running him off the road.¹ He described the vehicle as being a dark colored 1979 or 1980 Chevrolet pick up truck with "cherry bomb mufflers" and chrome on the side of the truck.

Danny Wannamaker, whose residence is directly adjacent to the Philadelphia Cemetery in Grundy County, testified that, at around 9:20 p.m. on April 19, 1990, he took a shower and prepared for bed. Around 9:50 p.m., he heard a vehicle that sounded like it did not have a muffler. He looked out the window, but did not see anything. Again, he heard the vehicle stop for a few minutes, then "the motor was turned off, cranked back up and took off, again approaching the house." Herbert Lewis, who also lives behind the Philadelphia Cemetery, was at home alone on the evening of April 19, 1990. Shortly after 9:30 p.m., he heard what appeared to be a female screaming for help, followed shortly thereafter, by a loud vehicle coming around the bend from behind the graveyard. He explained that he was not alarmed by the screams because he was "use (sic) to hearing people screaming, raising cane (sic) at the volleyball court."

The next morning between 7:00 and 7:30 a.m., Sharon Shannon, the daughter of Herbert and Melba Lewis, dropped her six-month-old son off at her parents' home. As she was leaving, she spotted what at first appeared to her to be shoes, however, she soon realized it was a body. Because her eleven year old daughter was in the vehicle with her, she did not stop, but returned to her parents' home instead. After leaving her daughter with her parents, Shannon returned to the cemetery to verify the presence of the body and then contacted the authorities. The body was identified as that of Michelle Blake.

¹The proof at trial revealed that a motorist traveling between the Pit Stop South and the Philadelphia Cemetery would take Highway 55 to 108, 108 to 127, 127 to 56, 56 to the Grundy County line, then to the cemetery. The total distance of this trip is approximately 16.2 miles. At the posted speed rate, this distance takes an average of twenty minutes to travel.

An investigative team with the Tennessee Bureau of Investigation arrived at the scene. The victim was found fully clothed with her blouse partially unbuttoned. Her brassiere was missing. The victim's body was examined for the presence of hair, fibers, and fingerprints. Joe Minor, a member of the investigative team, testified that a whitish stain which appeared to be semen was discovered on the left breast of the victim's body. The whitish stain extended from the victim's breast to her stomach. Examination of the stain revealed that the substance did contain spermatozoa, and further testing indicated that the source of the semen was a Type B secretor.

Dr. Charles Harlan, the chief medical examiner for the State of Tennessee, performed an autopsy upon the body of Michelle Blake on April 21, 1990. His report identified a total of seven stab wounds, one to the left side of the neck, four to the left breast, and two to the mid-line of the back. He indicated that the wounds were caused by a single sided instrument, three to three and one-half inches in length. Three of the wounds caused damage to main organs which resulted in the victim's death, i.e., damage to the carotid artery, damage to the heart, and damage to the right lung. He opined that death occurred within three to ten minutes of the injuries. The medical examiner further explained that a sharp line of demarcation existed on the victim's neck, indicative of ligature strangulation. He noted there were no defensive wounds and no evidence of forcible vaginal intercourse. He also determined that the victim's blood was type O.

Despite descriptions of the perpetrator, his truck, and available scientific evidence, the case remained unsolved for over two years. In July, 1992, Special Agent Larry Davis with the Tennessee Bureau of Investigation, was called to

assist Grundy County officials in the investigation of the June 7 murder of Vicky Sue Metzger, whose body was discovered at the I-24 Eastbound Rest Area near Monteagle. On July 13, Davis interviewed the appellant who was the attendant on duty at the rest area on the date of the murder. The attendant at the westbound rest area was also interviewed. Neither man was placed under arrest, although both men were asked to submit blood samples for DNA comparison analysis on semen found on the victim. On November 5, 1992, Davis was requested to assist in the investigation of an assault on another victim at the I-24 Eastbound Rest Area. On this occasion, the appellant was identified as the assailant and was in custody at the Monteagle police station when interviewed by Agent Davis. The appellant "stated that he had assaulted the victim because he had been drinking and smoking marijuana." Again, the appellant submitted to blood testing.²

From these tests, it was determined that the appellant has Type B blood. Review of the case file at this point led authorities to the belief that the appellant may have been involved in the 1990 death of Michelle Blake. DNA comparison analysis was then requested on the appellant's blood sample and the semen sample recovered from Mrs. Blake's body. The results from the tests revealed that the DNA binding pattern on each sample matched. Additional forensic tests established that fibers found on the victim's clothing were consistent with the fibers found in the carpet of the appellant's Chevrolet pick up truck. The proof at trial established that, in April, 1990, the appellant lived in Grundy County and was employed by a nursery in Warren County. On occasion, after regular working hours at the nursery, he would work for his supervisor, Floyd Hardcastle, who lived in Warren County. When working for Mr. Hardcastle, his commute to and from home would take him by the Pit Stop South. The appellant admitted

²Evidence of the crimes against Vicky Metzger and Pamela Sue Back, the second victim at the I-24 eastbound Rest Area, was developed during pre-trial suppression hearings.

that he had, on occasion, purchased gas at the Pit Stop South. However, when showed the photograph of Michelle Blake at trial, he stated that he did not recognize her. On cross-examination, the State introduced a payroll check from Hardcastle to the appellant, dated March 3, 1990, which was cashed at the Pit Stop South, bearing the initials "M.B." The initials were identified as being those of Michelle Blake. The appellant also admitted that, in April, 1990, he owned a 1977 gray Chevrolet short-bed pickup truck which displayed Grundy County license plates. He stated that he sold the truck in the spring of 1991. Additionally, the proof established that, in April of 1990, the appellant's truck had other matching characteristics to that of the truck driven by the abductor of Michelle Blake.

Based upon the evidence introduced, the jury convicted the appellant of first degree murder, aggravated kidnapping, and aggravated sexual battery.

Following the testimony of various defense witnesses and the proof introduced at the guilt phase, the jury fixed the appellant's sentence for first degree murder at life imprisonment.

Sentencing Phase: Aggravated Kidnapping and Aggravated Sexual Battery

_____The hearing to determine the appropriate sentences for the appellant's remaining convictions was held on May 12, 1994. The presentence report revealed that, at the time the report was prepared, the appellant was a twenty-six year old Caucasian male, married, and the father of a three year old son. He has a tenth grade education. After dropping out of school, he joined the Tennessee National Guard. He received an honorable discharge in 1992 attaining the rank of E-4. He admits to being an alcoholic and to occasional marijuana use. Since 1987, the appellant has worked for various employers in

the nursery business and, briefly, as a rest area attendant. Regarding the appellant's prior record, the report indicated that the appellant, on the date of the sentencing hearing in this case, had one count of first degree murder, one count of aggravated rape and two counts of aggravated robbery pending in the Grundy County Circuit Court. Additionally, the appellant has three prior convictions for driving while intoxicated, one conviction for possession of marijuana, and one conviction for driving on a revoked license. He was arrested for possession of a weapon for purposes of going armed, however, this charge was dismissed upon payment of costs and confiscation of the firearm.

Larry Davis, a special agent with the TBI, testified regarding his investigation of the murder of Vicky Sue Metzger and the assault of Pamela Sue Back. He explained that, through his investigation of these two cases, the TBI was able to target the appellant as a suspect in the present case. He also recounted the appellant's confession to the assault on Pamela Sue Back.

The trial court found three non-statutory mitigating factors and five statutory enhancement factors applicable. In doing so, the court imposed the maximum sentence of twelve years for each conviction within the range. Moreover, based upon the allegations of the pending indictments, the court concluded that the appellant was a dangerous offender and ordered that all sentences be served consecutively.

I. Sufficiency of the Indictment

The appellant first contends that the indictment for aggravated kidnapping is void because it fails to set forth the essential elements of the offense. Specifically, he argues that the indictment fails to allege the elements of false

imprisonment, which is an essential element of aggravated kidnapping. Count two of the indictment, which charged the offense of aggravated kidnapping, alleged in pertinent part as follows:

JOHN ALLEN CHAPMAN . . . did unlawfully, (intentionally), . . . remove and confine one Michelle Darlene Blake with the intent to inflict serious bodily injury upon the person of the said Michelle Darlene Blake, in violation of . . . Tenn. Code Ann. § 39-13-301. . .

³

(Emphasis added)

The appellant acknowledges that the charging instrument includes the statutory language “did unlawfully . . . remove and confine” one Michelle Darlene Blake. He argues, however, that the failure of the indictment to include the remaining statutory language “so as to interfere substantially with the other’s liberty” renders the indictment void.

An indictment should state the facts constituting the offense in ordinary and concise language in such a manner as to enable a person of common understanding to know what is intended, and with that degree of certainty which will enable the court, on conviction, to pronounce the proper judgment. Tenn. Code Ann. § 40-13-202 (1990); State v. Marshall, 870 S.W.2d 532, 537 (Tenn. Crim. App. 1993). This court recently held that “[i]f an offense is alleged in such a way that the defendant cannot fail to be apprised of the elements of the offense, the indictment is sufficient, notwithstanding the fact that an element may not be specifically alleged.” See State v. John Haws Burrell, No. 03C01-9404-CR-00157, (Tenn. Crim. App. at Knoxville, Feb. 11, 1997) (Rule 11 application filed, April 10, 1997).

The indictment in this case alleges that the appellant removed and

³Tenn. Code Ann. § 39-13-304(a) (1989) defines aggravated kidnapping as “false imprisonment committed . . . (3) with the intent to inflict serious bodily injury. . . .” False imprisonment is the knowing removal or confinement of another unlawfully so as to interfere with the other’s liberty. Tenn. Code Ann. § 39-13-302 (1989).

confined Michelle Darlene Blake with the intent to inflict serious bodily injury. We find the language of the indictment provides constitutionally sufficient notice of the offense charged as well as suitable protection against double jeopardy. This issue is without merit.

II. Sufficiency of the Evidence

Next, the appellant challenges the sufficiency of the convicting evidence as to each count of the indictment. Within this challenge, he alleges (1) that the evidence fails to prove, in regards to the aggravated kidnapping conviction, that "any removal or confinement substantially interfered with the victim's liberty;" (2) that, concerning the aggravated sexual battery conviction, there was no proof of unlawful sexual contact with the victim; and (3) that the State failed to establish, by either lay or expert testimony, that the appellant was, indeed, the perpetrator of the offenses committed against Ms. Blake.⁴

When a challenge is made on appeal to the sufficiency of the convicting evidence, this court must adhere to certain well-established principles. First, a jury conviction removes the presumption of innocence with which a defendant is initially cloaked and replaces it with one of guilt, so that on appeal a convicted defendant has the burden of demonstrating that the evidence is insufficient. State v. Tuggle, 639 S.W.2d 913, 914 (Tenn. 1982). Next, the State is entitled to the strongest legitimate view of the evidence and all reasonable or legitimate inferences which may be drawn therefrom. State v. Harris, 839 S.W.2d 54, 75 (Tenn. 1992). Moreover, this court may not reweigh or reevaluate the evidence. State v. Cabbage, 571 S.W.2d 832, 835 (Tenn. 1978). Viewing the evidence under these criteria, it is this court's responsibility to affirm the conviction if the

⁴The appellant does not challenge the sufficiency of the convicting evidence as to the offense of first degree murder other than to the issue of the perpetrator's identity.

proof was sufficient for any rational trier of fact to have found the essential elements of the offense beyond a reasonable doubt. Jackson v. Virginia, 443 U.S. 307, 317, 99 S.Ct. 2781, 2789 (1979); State v. Cazes, 875 S.W.2d 253, 259 (Tenn. 1994); Tenn. R. App. P. 13(e). This rule is applicable to findings of guilt predicated upon direct evidence, circumstantial evidence, or a combination of both direct and circumstantial evidence. State v. Matthews, 805 S.W.2d 776, 779 (Tenn. Crim. App. 1990).

A. Aggravated Kidnapping

The jury found the appellant guilty of aggravated kidnapping pursuant to Tenn. Code Ann. § 39-13-304(a). In order to obtain a conviction under this statute, the State must prove that the defendant committed the act of false imprisonment, as defined in §39-13-302, *supra* note 5, with the intent to inflict serious bodily injury. . . ." Tenn. Code Ann. § 39-13-304. The proof establishes that Mrs. Blake disappeared from the Pit Stop South during her scheduled shift, leaving behind her eyeglasses, which were later found in the parking lot. Her disappearance coincided with the appearance of the appellant at the convenience store. Mrs. Blake did not know the appellant. Various witnesses thought they heard the victim's screams. The following morning, the victim was found brutally murdered. We find nothing from these facts to suggest that the departure of the victim from her place of employment was occasioned by any thing other than removal and confinement by force, ultimately resulting in her death. This issue is without merit.⁵

B. Aggravated Sexual Battery

Next, the appellant challenges his conviction for the aggravated sexual battery committed against Michelle Blake. Although he concedes that the proof

⁵Within this issue, the appellant, again, contends that the indictment fails to allege that "any removal or confinement substantially interfered with the victim's liberty." This contention has previously been addressed in Section I, and, was found to be without merit.

establishes serious bodily injury, i.e., multiple stab wounds, he contends that there is "no proof of any sexual contact with Mrs. Blake's body either before or after her death. The entire proof on this issue consisted of the testimony that . . . a semen stain was recovered from the left portion off her body extending from her left breast to her abdominal area." He argues that the "record discloses no evidence whatsoever that the victim's intimate parts were touched as part and parcel of a sexual act."

In order to sustain a conviction for aggravated sexual battery, this court must find that the proof establishes that the appellant made unlawful sexual contact with the victim and caused bodily injury to the victim. Tenn. Code Ann. § 39-13-504 (a)(2) (1989). "'Sexual contact' includes the intentional touching of the victim's, the defendant's, or any other person's intimate parts, or the intentional touching of the clothing covering the immediate area of the victim's, defendant's, or any other person's intimate parts, if that intentional touching can be *reasonably construed* as being for the purpose of sexual arousal or gratification." Tenn. Code Ann. § 39-13-501(6) (1989) (emphasis added). "'Intimate parts' includes the . . . breast of a human being." Tenn. Code Ann. § 39-13-501(2). Again, as the appellant concedes, the proof showed semen stains on Michelle Blake's left breast and abdomen. DNA evidence, identity testimony, and other circumstantial evidence linked the appellant to the crimes committed against Mrs. Blake. Clearly, from the proof introduced, the jury could have rationally inferred that it was the appellant who deposited the semen on the victim's breast. This fact is sufficient to establish sexual contact. Our statute does not require that "intentional touching" of the victim's intimate part result from direct contact with the defendant's hand or any other part of the defendant's body. This issue is without merit.

C. Identity of the Perpetrator

The appellant's main contention regarding his challenge to the sufficiency of the evidence is that the proof fails to establish that he is the perpetrator of the offenses. Specifically, the appellant questions the reliability of eyewitness testimony identifying him "as the individual at the Pit Stop South at or near 8:50 p.m. or thereafter on April 19," and, he attacks the accuracy of the scientific evidence due to deficient collection of evidence and inappropriate scientific procedures.⁶ The State responds that both the direct and circumstantial proof establish the appellant as the offender in this case.

Ed Martin and Sylvia Fults provided identification testimony at trial.⁷ Moreover, the proof at trial revealed numerous matching characteristics between the appellant's truck and the truck driven by the abductor of Michelle Blake. Both trucks were described as older model trucks, both short-wheeled base, both gray in color, both displayed Grundy County license plates, both had loud mufflers, both had chrome on the side, and both had the name "Chevrolet" on the tailgate. Fibers later obtained from the appellant's truck were consistent with those obtained from Michelle Blake's clothing. Other proof revealed that testing of the semen found on Michelle Blake's body indicated that the perpetrator has Type B blood. The appellant has Type B blood. Moreover, the DNA binding patterns obtained from the two samples matched.⁸

The State must prove beyond a reasonable doubt that the accused is the person who committed the offense. See White v. State, 533 S.W.2d 735, 744 (Tenn. Crim. App. 1975), perm. to appeal denied, (Tenn. 1976). Identity of the

⁶The appellant contests the admissibility of the DNA opinion evidence. This allegation is addressed as a separate issue by the appellant and will be so addressed by this court. See infra Section III.

⁷Although less than positive identification was provided by either, Ed Martin testified, "I think I can identify the person in the truck," and pointed to the appellant. Fults testified that the appellant looked like the man she saw at the Pit Stop South "except for the hair and weight."

⁸The frequency of the binding pattern in Caucasians is 1 in 19,000.

accused may be accomplished by either direct or circumstantial evidence, or both. State v. Thompson, 519 S.W.2d 789, 793 (Tenn. 1975). The determination of identity is a question of fact for the jury after a consideration of all competent evidence. See Biggers v. State, 411 S.W.2d 696, 697 (Tenn.), cert. granted, 390 U.S. 404, 88 S.Ct. 979 (1968) (affirmed on other grounds); Marable v. State, 313 S.W.2d 451 (Tenn. 1958); State v. Crawford, 635 S.W.2d 704 (Tenn. Crim. App. 1982); State v. Hodge, No. 6 (Tenn. Crim. App. at Jackson, June 30, 1987). Likewise, the determination of whether all reasonable theories are excluded by the circumstantial evidence presented is primarily a question of fact for the jury. Pruitt v. State, 460 S.W.2d 385 (Tenn. Crim. App. 1970); Hodge, No. 6. This case is based entirely upon circumstantial evidence. Before an accused may be convicted upon circumstantial evidence alone, the facts must be “so clearly interwoven and connected that the finger of guilt is pointed unerringly at the defendant and the defendant alone.” State v. Howell, 868 S.W.2d 238, 253-254 (Tenn.), cert. denied, - - U.S. - - , 114 S.Ct. 1339 (1993).

We conclude that the proof in the record points the finger of guilt unerringly at the appellant and the appellant alone, and that the proof was sufficient for a jury to have found the essential elements of the offenses beyond a reasonable doubt.

III. DNA Opinion Evidence

Prior to trial, the appellant filed a motion *in limine* seeking to exclude the results of a DNA profiling analysis performed by Cellmark Diagnostics, a private Maryland laboratory contracted by the Tennessee Bureau of Investigation in the present case. These results revealed that the appellant's DNA matched DNA

samples (semen) recovered from the victim. At the conclusion of a lengthy hearing on the appellant's motion, the trial court, after considering the testimony of Dr. Lisa Forman, a Cellmark representative, ruled that the expert testimony concerning the DNA analysis was admissible.

At trial, Dr. Forman and Julie Cooper, a senior molecular biologist with Cellmark, testified on behalf of the State regarding Cellmark's testing procedures and the results attained in the present case. To rebut this testimony, the defense presented the testimony of Dr. Marvin Shapiro, a professor at Emory University, and Dr. Ronald T. Acton, a professor at the University of Alabama. Dr. Shapiro opined that Cellmark used an insufficient database by failing to employ an Appalachian subgroup database, in determining their frequency calculation, and, as such, their results cannot be deemed accurate or reliable. Dr. Acton commented on the ongoing concerns in the scientific community with the use of ethidium bromide at the beginning of the analysis procedure.⁹ He further noted that Cellmark's combination of probes furnished results which were just an estimate at best and that Cellmark's method of combining probes has not been scientifically validated.

On appeal, the appellant contends that the trial court failed to properly apply Tenn.R.Evid. 702, 703, and 403 in reaching its decision to allow the State to introduce DNA opinion testimony. Specifically, he asserts that the testimony introduced by representatives of Cellmark Diagnostic, the testing laboratory, is inadmissible because Cellmark's testing procedure indicates a "lack of trustworthiness." In this regard, the appellant contests:

(1) Cellmark's use of ethidium bromide in the agarose gel before electrophoresis;

⁹Ethidium bromide is a florescent dye that binds to DNA, allowing it to be visualized.

(2) Cellmark's selection and use of a Caucasian database from Delaware and failure to use a database exclusively from Appalachia; and

(3) Cellmark's statistical analysis of the population frequencies.

The appellant challenges specific techniques employed by Cellmark in the DNA analysis performed in this case. Due to the complex nature of the subject matter, an understanding of the structure of the DNA molecule and the precise procedures utilized is helpful to our review.

A. Scientific Background

I. DNA Structure

The DNA molecule is a double helix, shaped like a twisted ladder. Phosphate and deoxyribose sugar form the rails of the ladder. Four chemical bases -- Adenine (A), Cytosine (C), Guanine (G), and Thymine (T) - lie next to each other on the sugar links along the sides of the ladder. Each A always bonds with a T on the other side of the ladder, and each C always bonds with a G on the other side of the ladder, so that the possible base pairs on the ladder are A-T, T-A, C-G, and G-C. The base pairs, e.g., A-T, C-G, are connected by a hydrogen bond, such that the bonds form the rungs of the ladder. There are approximately three billion base pairs in one DNA molecule. The sequence of the base pairs is the same in every cell of a person's body.

Of the three billion base pairs, ninety-nine and nine-tenths percent are identical among all human beings. It is this identity that makes humans look like humans. Thus, only the remaining one-tenth of one percent of a person's base pairs vary from person to person.¹⁰ These sequences of variation from person to person are known as polymorphisms. Polymorphisms are the key to DNA

¹⁰We note that identical twins have all three billion pairs the same.

identification because they create the individual characteristics of each human being and they are detectable in laboratory testing.

ii. Generating DNA Profiles

Testing for DNA identification involves disassembling the ladder (DNA molecule) in one of several ways. Cellmark Diagnostics, the testing laboratory in this case, employs the Restriction Fragment Length Polymorphism (RFLP) method of analysis. The RFLP method determines if there is a "match." A "match" does not mean that the suspect is with certainty the source of the genetic material found at the crime scene or on the victim, but only that the suspect cannot be eliminated as a potential source. RFLP analysis involves extracting and isolating small portions of the DNA molecule to examine sites on the DNA that exhibit highly variable characteristics.¹¹

The preliminary procedure is to extract a DNA molecule from a sample of certain tissue or bodily fluid by using chemical enzymes and then to purify that sample. The DNA molecule is "cut" into smaller fragments with chemical scissors called restriction enzymes. These enzymes recognize certain base pairs and sever the DNA molecule at specifically targeted base pair sites to produce RFLPs. The cut fragments of DNA molecules (RFLPs) are next placed in an agarose gel and ethidium bromide is incorporated into the gel.¹² The gel is then electrically charged to sort the fragments by length. This process is known as electrophoresis. The electric current causes the fragments to migrate through the gel. The distance traveled depends upon the length of the fragments; the

¹¹The following procedure explained herein summarizes the RFLP procedure utilized by Cellmark Diagnostic in the present case. We acknowledge, however, that other variations of the RFLP method of DNA analysis exist and are employed successfully by other laboratories.

¹²Questions have arisen concerning the use of ethidium bromide at the beginning of the process. Using ethidium bromide prior to electrophoresis has been shown to alter the mobility of fragments at high DNA concentrations, thus decreasing the reliability of fragment size measurements.

shorter fragments, because they are lighter, will travel further in the gel. Once migration has ceased, the fragments of known base pair lengths are placed in separate lanes to allow the measurement of RFLPs in units of base pairs. A nylon membrane is placed over the gel, permanently transferring the RFLPs to this more functional surface.¹³ A denaturation process occurs during this step, severing each double-stranded DNA fragment into two single strands. This facilitates detection of specific RFLPs and Variable Number Tandem Repeats (VNTRs), i.e., the number of repeat core sequences of base pairs which determine the length of each RFLP.

RFLPs that are defined by specific sequences are detected by hybridization with a genetic probe, a single stranded segment of DNA tagged with a radioactive reporter molecule designed to detect a complementary single strand base sequence.¹⁴ The membrane is placed in a bath that contains the probe, and the probe hybridizes to the target denatured RFLP.

Next, the nylon membrane is placed in contact with a piece of x-ray film where the radioactive probes expose the film at their respective locations.¹⁵ Black bands appear where the radioactive probes have bonded to the RFLPs, producing a DNA "print," or autorad. The position of each band indicates the location of a polymorphic segment on the blot. Location, in turn, indicates the length of the DNA fragment that contains the polymorphic DNA segment.¹⁶ The particular region on the DNA where a specific VNTR occurs is called a locus. A locus is considered polymorphic when the number of VNTRs varies from individual to individual. Each locus consists of variant forms of genes known as

¹³This process is known as "Southern Blotting."

¹⁴The probes utilized in this case were MS1, MS31, MS43, G3.

¹⁵This process is referred to as autoradiography.

¹⁶It is the length of the DNA fragments that individualizes each living thing, thus, the position of the bands on a DNA print can differentiate individuals.

alleles. Two allele forms occupy each locus, one on a chromosome inherited from the mother, and one on a chromosome inherited from the father. When the same form of allele occupies both loci on the chromosomes the individual is homozygous for that allele, and when different alleles occupy the loci, the individual is heterozygous for both alleles.¹⁷ Typically, this process is repeated with four or five different probes. Several probes are necessary because, although the degree of individualization for the two alleles that occur on one locus is not high, it is extremely rare for two people to have eight or ten matching alleles across four or five different loci.

The last step in the RFLP process is to determine if a match exists in the two lanes of the autorad between the DNA sample from the suspect and the forensic sample taken from the crime scene or the victim.¹⁸ If it matches, the analyst must determine the likelihood that someone other than the suspect might have the same DNA pattern. This calculation of the probability of a random match generates a ratio to accompany a match, the purpose of which is to express the statistical likelihood that an unrelated person chosen at random from a particular population could have the same DNA profile as the suspect.

iii. Frequency Calculations

The initial process in generating this ratio involves the creation of an autorad database. In the present case, Cellmark's database was comprised of DNA autorads from Caucasian individuals who donated blood at a Delaware blood bank, along with an African-American database, and a Hispanic database. Racially similar databases are used to create a greater likelihood of a DNA profile match, which safeguards against understating the probability of a random

¹⁷The alleles which comprise the loci consist of multiple pairs of the nucleotide bases A, T, G, and C, *supra*, which bond according to the base pair rule. In order to generate a profile that is unique, Cellmark studies four highly variable sites referred to as polymorphic loci.

¹⁸In the present case, the six bands that were obtained from the DNA sample (semen) recovered from the victim match the six bands obtained from the DNA labeled John Chapman.

match.

Once a database is constructed, autorad band frequencies are calculated by comparing the known bands with the database bands to determine how frequently bands match. Scientists use either fixed or floating bin analysis to calculate match frequencies. Binning helps to account for variables in recording autorads, and provides confidence limits on frequency estimates. Cellmark employs a floating bin analysis. Floating bin analysis focuses on the autorads obtained from the evidence sample, around which individual bins are constructed. Typically, floating bins are constructed with a resolution tolerance of a certain number of standard deviations centered around the evidence band. Database bands which fall within the bin created from the evidence band are then assigned to the evidence band's floating bin to calculate band frequencies. Binning typically results in higher probable match frequencies. The higher match frequencies weigh in a suspect's favor because the probability calculations will yield a greater chance of a random match.¹⁹

After individual band frequencies are calculated, the likelihood that the complete autorad would be duplicated in a randomly selected individual is calculated using the product rule. The product rule is simply the mathematical formula used to determine the probability that two independent events would occur simultaneously, calculated by multiplying the probability of each event. Two product rule calculations are required to determine the likelihood of a random profile match. First, the frequency of a match at each locus is

¹⁹In the present case, a combination of two bands was necessary in order to calculate the frequency. Cooper used the analysis specific to probes MS1 and MS31 because they could be identified in the evidence as well as in the blood. However, the remaining three bands were either MS43 or G3. So, a combined analysis was completed on the final three bands. Cooper testified that the combination of data in determining a frequency statistic results in a more conservative number.

calculated.²⁰ After the frequency for each locus is calculated, the frequency of the complete genotype (genetic makeup of an organism) is calculated by multiplying together the four loci frequencies.

Product rule probabilities are only accurate estimates if the events underlying the calculations are truly independent and random. Independence means the probability of finding one allele is not affected by having found any other allele. For each locus, event independence occurs when there is no correlation between the allele inherited from an individual's mother and the allele inherited from that individual's father. When no correlation between the two parental alleles exists the population sample is considered in Hardy-Weinberg equilibrium.²¹ Several critics have noted that there is a problem in that the product rule method is based on incorrect assumptions that (1) members of the racial groups represented by the broad data bases, Caucasians, Black, Hispanic, etc., mate within their groups at random, without regard to religion, ethnicity, and geography, and (2) the DNA fragments, identified by DNA processing behave independently and they are independent in a statistical sense. Contrary to the assumption of random mating, ethnic subgroups within each random data base, tend to mate within a specific subgroup, e.g., the Appalachian subgroup, Jewish subgroup. Such endogamous mating tends to maintain genetic differences between subgroups, as a result, the subgroups may have substantial differences in the frequency of a given DNA fragment, or VNTR allele, identified in the

²⁰Because the bands generated at each locus depend on whether the individual is homozygous or heterozygous for those particular alleles, the formula varies depending on the allele form. The frequency for a homozygous allele is computed using the formula $p(a_1)^2$; the frequency for a heterozygous allele is computed using $2(p(a_1)p(a_2))$; where p denotes probability, and a_1 represents each allele.

²¹Hardy-Weinberg principles derive from an algebraic equation that describes the genetic equilibrium within a population. The principle states that gene frequencies will remain constant from generation to generation within a population unless outside forces act to change it, provided mating remains random.

processing step of DNA analysis.²² A given VNTR allele may be relatively common in some subgroups but not in the broader database. Thus, some critics argue that the current method, using the Hardy-Weinberg equation and the product rule, will be reliable only if there is extensive study of VNTR allele frequencies in a wide variety of ethnic subgroups. However, the National Research Academy remarks that "[t]he goal is not to ensure that the ethnic background of every particular defendant is represented, but rather to define the likely range of allele frequency variation." NATIONAL RESEARCH COUNSEL, DNA TECHNOLOGY IN FORENSIC SCIENCE 82-85 (1992). Moreover, to overcome the problem of allele frequency within a genetic subgroup, the National Research Academy recommends employing the ceiling principal in determining frequency statistics. Id.

When requested, as in the present case, Cellmark also employs what is known as the "ceiling principle" to calculate statistical frequencies. The ceiling method also uses the product rule. This method obtains the most conservative bin for every band and then multiplies it together, generally resulting in a more conservative number. Using the aforementioned procedures, Cellmark determined that the frequency reported, in the present case, as far as the Caucasian race, was one in nineteen thousand.

B. Standard of Admissibility

In State v. Harris, 866 S.W.2d 583, 586 (Tenn. Crim. App. 1992), this court addressed the proper standard for determining the admissibility of scientific evidence and testimony.²³ The court acknowledged the Frye test, see Frye v.

²²This hypothesis is the basis of the appellant's challenge of Cellmark's results. He argues that, since an Appalachian subgroup was not employed by Cellmark, the ratio produced in the instant case cannot be accurate.

²³The appellant correctly states that Tenn. Code Ann. § 24-7-117 (1991) (admissibility of the results of DNA analysis in civil or criminal trials) is inconsequential to the present case as it only applies "to persons committing or attempting to commit one of the offenses set out in § 40-35-321 on or after July 1, 1991." See Compiler's Notes, Tenn. Code Ann. § 24-7-117. The

United States, 293 F. 1013 (D.C. Cir. 1923), which requires that the scientific analysis from which the ultimate deduction is made must be "sufficiently established to have gained general acceptance in the particular field in which it belongs." Id. at 1014. Additionally, the court recognized the Tennessee Rules of Evidence, which provide:

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.

Tenn.R.Evid. 702. However, the rule adds that the court "shall disallow testimony in the form of an opinion or inference if the underlying facts or data lack trustworthiness." Tenn.R.Evid. 703 (emphasis added).

The court in Harris chose not to accredit one standard over the other, as the evidence at issue satisfied both requirements. See Harris, 866 S.W.2d at 587. Subsequently, however, the United States Supreme Court in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 587, 113 S.Ct. 2786, 2793 (1993), held that the Frye test, "absent from and incompatible with the Federal Rules of Evidence, should not be applied in federal trials." Daubert does not by its terms, however, apply to state court proceedings. Although Tenn.R.Evid. 703 and Fed.R.Evid. 703 are identical, Tenn.R.Evid. adds the sentence: "The court shall disallow testimony in the form of an opinion or an inference if the underlying facts or data indicate a lack of trustworthiness." In this respect, the Tennessee rule expresses a greater concern with the bases of expert testimony than its federal counterpart. Omni Aviation v. Perry, 807 S.W.2d 276, 281 (Tenn. App. 1990). Moreover, our supreme court has held that the requisite foundations which must be established prior to the admission of scientific evidence are that (1) the facts underlying the testimony must be reasonably relied upon by experts

offenses in the present case occurred on or about April 19, 1990.

in the particular field and (2) the facts must be trustworthy. State v. Ballard, 855 S.W.2d 557, 562 (Tenn. 1993); see also Advisory Commission Comments, Tenn.R.Evid. 703. We conclude that the "general acceptance standard" espoused in Frye is necessarily implicit within the requirements of Tenn.R.Evid. 703. See Advisory Commission Comments, Tenn.R.Evid. 702 (Tennessee law is consistent with the Frye test). Accordingly, before expert testimony regarding DNA analysis may be admitted in Tennessee, the proposed testimony and evidence must meet the standards promulgated by Tenn.R.Evid. 702 and 703.

C. Application of Standard

The trial court concluded that Cellmark's techniques in generating a DNA profile and formulating a statistical frequency were based on accepted scientific practice and are trustworthy.²⁴ See, e.g., Harris, 866 S.W.2d at 586 (approving RFLP analysis); accord State v. Begley, No. 01C01-9411-CR-00381 (Tenn. Crim. App. at Nashville, Jan. 11, 1996), perm. to appeal granted, (Tenn. July 1, 1996). Generally, the qualifications, admissibility, relevancy, and competency of expert testimony are matters which largely rest within the sound discretion of the trial court, unless such discretion is arbitrarily imposed. Ballard, 855 S.W.2d at 562; see also State v. Schimpf, 782 S.W.2d 186, 191 (Tenn. Crim. App. 1989). Without evidence that Cellmark's standards were somehow deficient, we cannot conclude that the trial court abused its discretion or that the laboratory's conclusion was unreliable.

Once evidence is properly admitted, disputes over its reliability go to its weight. Here, much of the appellant's attack focused on Cellmark's implementation of DNA frequency analysis and specifics of Cellmark's procedures, including the size of Cellmark's database, whether the sampling of a

²⁴The procedures and protocols employed by Cellmark in the present case are substantially in compliance with the recommended procedures of the Technical Working Group on DNA Analysis Methods (TWGDAM).

Delaware blood bank was truly random, and alleged problems with the electrophoresis process. This attack was presented to the jury through the testimony of Drs. Shapiro and Acton. Differences in the opinions of experts are inevitable in the application of science to the law. In our opinion, these issues were questions properly decided by the jury. The jury was free to reject the DNA evidence if it concluded that the evidence was unreliable or misleading.

The appellant also argues that the evidence should have been excluded because its probative value was outweighed by its prejudicial effect. Tenn.R.Evid. 403. The appellant makes no argument in support of this contention. As such, this claim is waived. Tenn. R. App. P. 27(a)(7).

Nonetheless, the testimony, in sum, was that the appellant could not be excluded as a source of the semen found on the victim, but could not be identified as the source with absolute certainty. Clearly, the probative value of the expert testimony outweighed any prejudicial effect.

In summary, we conclude that the trial court properly analyzed the DNA typing evidence according to the Tennessee Rules of Evidence. Furthermore, we find that the existence of scientific debate does not, by itself, require exclusion of evidence. The DNA statistical frequency analysis was generally accepted by the scientific community at all times relevant to the trial court's decision. Thus, the evidence exhibited both reliability and trustworthiness. The trial court did not abuse its discretion in admitting the calculations as to frequency probability, and it was for the jury to determine what weight, if any, to give such evidence. Additionally, we note that the State did not rely exclusively on the DNA evidence to prove its case. Sufficient evidence existed apart from the DNA analysis from which the jury could have concluded the appellant's guilt. This issue is without merit.

IV. Motion to Suppress

A hearing was held on March 1, 1994, regarding the appellant's motion to suppress blood samples obtained from his person. At the hearing, the State presented the testimony of only one witness, Larry Davis, a special agent with the Tennessee Bureau of Investigation. Agent Davis explained that on June 7, 1990, the body of Vicky Sue Metzger was found in a wooded area adjacent to the eastbound I-24 rest area near Monteagle. Davis was assigned to investigate the Metzger murder. During the early stages of the murder investigation, Davis talked with the appellant, who was the attendant at the eastbound rest area, and

Johnny Hood, the attendant at the westbound rest area. On this occasion, Davis informed both men that they would be contacted in the future for additional statements. On July 11, Davis issued subpoenas for both men setting a July 13 interview.

On July 13, 1990, Agent Davis met the appellant and Hood at the Grundy County Jail. Both men gave sworn statements and both men consented to provide a blood sample for DNA comparison analysis with the semen found on the victim's body. The appellant and Hood were taken to Dr. Horbolt's office and the samples were drawn. At no time did the appellant voice an objection to the procedure. After the sample was drawn, the appellant left the doctor's office.

Subsequently, on November 5, 1992, Agent Davis was again called to the eastbound I-24 rest area to investigate an assault on Pamela Sue Back. When Davis reached the Monteagle Police Station, the appellant was in custody and had been provided *Miranda* warnings. Upon questioning by Agent Davis, the appellant confessed that he had assaulted Back because he had been drinking and smoking marijuana. Davis asked the appellant if he would provide a blood sample for a drug screen. The appellant again consented. The appellant was then transported to the Emerald-Hodgson Hospital in Sewanee where the blood sample was taken.²⁵

Several days later, Davis reviewed the I-24 incidents and the murder of Michelle Blake with Agent Danny Wix and Investigator Bouldin. The officers recalled that the perpetrator of the Blake murder had type B blood, the same type possessed by the appellant. Agent Wix inquired about obtaining another

²⁵On July 17, 1990, at least seven additional TBI subpoenas were issued to area hospitals requiring them to produce names and other personal information on white male patients with blood type B. We reject the appellant's argument that this alleged dragnet approach violated his constitutional rights under the holding of Davis v. Mississippi, 394 U.S. 721, 89 S.Ct. 1394 (1969).

blood sample from the appellant. Agent Davis responded that he had a blood sample from the appellant drawn on November 5 at his office. This sample was sent to Cellmark Diagnostics for DNA analysis in the Blake case. No alcohol or drug screen was performed on this sample.

The appellant contends that the trial court erroneously denied his motion to suppress the evidence stemming from blood samples taken from him on these two separate occasions. In denying the motion, the trial court concluded that "the blood samples provided by the appellant were done so consensually and voluntarily."

The initial inquiry before us is whether the TBI subpoena issued to the appellant on July 11, 1990, constituted a significant intrusion upon interests protected by the Fourth Amendment.²⁶ Fourth Amendment protections against unlawful seizures are designed to "prevent arbitrary and oppressive interference by officials with the privacy and personal security of individuals." INS v. Delgado, 466 U.S. 210, 215, 104 S.Ct. 1758, 1762 (1984) (internal quotations omitted). Therefore, "not all . . . intercourse between policemen and citizens involves seizures of persons. Only when an officer, by means of force or show of authority, has restrained the liberty of a citizen may we conclude that a seizure has occurred." Terry v. Ohio, 392 U.S. 1, 19, 88 S.Ct. 1868, 1879, n. 16 (1968). Although the appellant, in the instant case, received a subpoena to appear for further questioning, we cannot conclude that this amounted to more than a request to respond to police questioning. First, no sanctions exist for failure to comply with the request in the subpoena.²⁷ Moreover, although most people will

²⁶Tenn. Code Ann. § 38-6-102 provides that "criminal investigators shall have full power to issue subpoenas for witnesses"

²⁷The subpoena received by the appellant was captioned "Tennessee Bureau of Investigation Subpoena" and provided, in pertinent part:
You are hereby commanded to summon John Chapman to personally appear before the undersigned Special Agent of the Tennessee Bureau of Investigation on July 13th, 1992, at 1:00 p m at Grundy Co. Jail, Altamont, Tennessee and

comply with a police request, the fact that people do so, and do so without being told they are free not to respond, does not eliminate the consensual nature of the response. INS v. Delgado, 466 U.S. at 216, 104 S.Ct. at 1762. Unless the circumstances of the encounter at issue are so intimidating as to demonstrate that a reasonable person would have believed he was not free to refuse the officer's request, one cannot say that the questioning resulted in a detention under the Fourth Amendment. Id. Thus, although we concede the question is perilously close, we conclude that the issuance of a TBI subpoena does not, *per se*, constitute a seizure within the meaning of the Fourth Amendment. However, this consensual encounter may escalate into a seizure as a consequence of police behavior, e.g., threatening presence of several officers, the display of a weapon by the officer, physical touching of the person, or the use of language or tone of voice indicating that compliance with the officer's request might be compelled. United States v. Mendenhall, 446 U.S. 544, 554-55, 100 S.Ct. 1870, 1877 (1980). In the present case, Agent Davis testified that the appellant came to the police station of his own free will. In fact, Davis had previously informed the appellant of his intent to contact him for a subsequent statement, at which time the appellant was cooperative. And, although the appellant bears the initial burden of showing that there was a violation of some constitutionally protected area to trigger further inquiry, there is no evidence indicating that the appellant would have refused the subsequent interview notwithstanding service of the subpoena. See State v. Burton, 751 S.W.2d 440 (Tenn. Crim. App. 1988). Absent any evidence indicating force or coercion on the part of law enforcement officials, the inoffensive contact, i.e., the questioning of the appellant at the jail, cannot amount to an unconstitutional seizure. Id.

from day to day hereafter until discharged and bring all papers, books, records, agreements, documents and _____ to be sworn and questioned by the undersigned Special Agent for the purpose of giving a written statement, delivering aforementioned items and obtaining evidence by said agent in an investigation conducted by the Tennessee Bureau of Investigation pertaining to TBI File 5A-530.

Although we have determined that the appellant's presence at the jail did not constitute an illegal seizure, we must next determine whether the subsequent taking of blood samples constituted an illegal search of the appellant's person. The withdrawal of blood from a subject for purposes of serological typing and DNA analysis constitutes a search within the constraints of the Fourth Amendment and, therefore, a search warrant is generally required. See Schmerber v. California, 384 U.S. 757, 767-72, 86 S.Ct. 1826, 1833-37 (1966); see also State v. Jackson, 889 S.W.2d 219, 221 (Tenn. Crim. App. 1993), perm. to appeal denied, (Tenn. 1994). Unless it falls within a specifically established and well-delineated exception, a search conducted without a warrant is *per se* unreasonable. Schneckloth v. Bustamonte, 412 U.S. 218, 219, 93 S.Ct. 2041, 2043 (1973) (citations omitted). "One of the specifically established exceptions to both a warrant and probable cause is a search that is conducted pursuant to a voluntarily given consent." Id. at 219, 93 S.Ct. at 2043, 2044 (citations omitted); see also State v. Bartram, 925 S.W.2d 227, 230 (Tenn. 1996). The burden of proof rests upon the State to show, by a preponderance of the evidence, that the consent to a warrantless search was given freely and voluntarily. Schneckloth, 412 U.S. at 248-49, 93 S.Ct. at 2059; Bumper v. North Carolina, 391 U.S. 543, 548, 88 S.Ct. 1788, 1792 (1968); Bartram, 925 S.W.2d at 230. The question of whether the appellant voluntarily consented to the search is a question of fact which focuses upon the totality of the circumstances. Schneckloth, 412 U.S. at 248-249, 93 S.Ct. at 2059.

In the present case, the trial court accredited Agent Davis' testimony that the appellant voluntarily consented to providing both blood samples. There was no indication that the appellant's acquiescence to the "search" was the result of force or coercion. In fact, the defense presented no proof to refute Agent Davis' testimony. A trial court's finding that a search is consensual is presumed correct

and is conclusive on appeal unless the evidence preponderates against the ruling. State v. Woods, 806 S.W.2d 205, 208 (Tenn. Crim. App. 1990), perm. to appeal denied, (Tenn. 1991), cert.denied, 502 U.S. 1079, 112 S.Ct. 986 (1992); see also State v. Dougherty, 930 S.W.2d 85, 86 (Tenn. Crim. App. 1996); State v. Tuttle, 914 S.W.2d 926, 931 (Tenn. Crim. App. 1995). We conclude that the evidence in the record supports the trial court's finding. This issue is without merit.

V. Instruction on Identity

The appellant contends that the trial court committed reversible error by failing to instruct the jury on the issue of identity as provided in State v. Dyle, 899 S.W.2d 607 (Tenn. 1995). The appellant concedes that, because his trial occurred prior to the Dyle opinion, no special instruction regarding identity was requested.²⁸ In Dyle, our supreme court held that the identity instruction, promulgated within that decision, must be given when identification is a material issue. Dyle, 899 S.W.2d at 612. "Identity will be a material issue when the defendant puts it at issue or the eyewitness testimony is uncorroborated by circumstantial evidence." Id. at note 4. In our opinion, the trial court's failure to instruct on identity in the present case was harmless. The proof regarding identification was more than sufficient. The descriptions of the appellant and his vehicle by numerous witnesses were generally consistent. Fibers from the victim's clothing were determined to be consistent with fibers from the carpeting of the appellant's truck. Most notably, the results of the DNA profile analysis reveal that the appellant's DNA matched the DNA obtained from the semen stain on the victim's body. It was within the jury's prerogative to assess the credibility

²⁸The appellant's trial began on March 21, 1994, concluding on April 2, 1994, over one year prior to our supreme court's opinion in Dyle, 899 S.W.2d at 612, which was released on May 15, 1995. However, Dyle is applicable both to those cases on appeal when the opinion was released and to those cases tried after that date. Id.

of those who testified. Any error created by the failure to provide the Dyle instruction was harmless. State v. Williams, No. 01C01-9505-CR-00146 (Tenn. Crim. App. at Jackson, Nov. 12, 1996). This contention of the appellant is without merit.

VI. Scope of Cross-Examination

Next, the appellant makes two arguments regarding the examination of the DNA experts from Cellmark Diagnostics. Julie Cooper, a senior molecular biologist with Cellmark, testified for the State. In response to defense counsel's questions on cross-examination, Cooper testified that, in 1988, Cellmark responded to an invitation extended by the California Association of Crime Lab Directors to bid for services to complete forensic DNA analysis for the State of California. Prior to being awarded the contract, Cellmark was required to submit analysis on unknown controlled random samples.²⁹ During further cross-examination, defense counsel questioned Cooper concerning alleged errors made by Cellmark on the sample tests.³⁰ On re-direct, Cooper testified that forty percent of Cellmark's cases originate from the State of California. She further explained that, in regard to the 1988 test, "California was interested in seeing how well Cellmark, as a laboratory, function[ed] on their test." The appellant argues this re-direct testimony was error. He contends that these statements constitute inadmissible hearsay, were made outside the scope of cross-examination, and are self-serving statements offered in an attempt to bolster the credibility of Cellmark.

²⁹Cooper testified that, unlike routine forensic testing, serological testing had not been performed on the test samples. Therefore, Cellmark was not informed as to whether the samples were blood, ketchup, etc.

³⁰Cooper testified that "there was one erroneous match made out of those 50 samples."

"The right to cross-examination is fundamental, thus, the denial of this right to apprise the accused a fair trial is 'constitutional error of the first magnitude.'" State v. Henning, No. 02C01-9504-CC-00115 (Tenn. Crim. App. at Jackson, Jan. 9, 1997) (quoting State v. Hill, 598 S.W.2d 815, 819 (Tenn. Crim. App. 1980)). Yet, the propriety, scope, manner and control of testimony and other evidence, including the scope of cross and re-direct examination, is within the sound discretion of the trial court, which will not be reversed absent an abuse of that discretion. See State v. Barnard, 899 S.W.2d 617, 624 (Tenn. Crim. App.), perm. to appeal denied, (Tenn. 1994) (citing State v. Banks, 564 S.W.2d 947, 949 (Tenn. 1978)); State v. Elrod, 721 S.W.2d 820, 823 (Tenn. Crim. App. 1986); Tenn. R. Evid. 611(a).

The scope of cross-examination extends to "any matter relevant to any issue in the case, including credibility." Tenn.R.Evid. 611(b). The scope of re-direct examination is generally limited to matters brought out during cross-examination, however, new matters may be introduced. Bouchard v. State, 554 S.W.2d 654, 658-659 (Tenn, Crim. App. 1977); Lundy v. State, 521 S.W.2d 591, 594 (Tenn. Crim. App. 1974). It is within the trial court's discretion to allow a party, on redirect examination, to supply testimony omitted by oversight, or to clarify testimony given on direct examination, or, where the facts thus developed

are not inconsistent with his previous answers to ask a witness to expand his testimony. Barnard, 899 S.W.2d at 624 (citing 98 C.J.S. *Witnesses* § 419 (1955)); see also State v. Owen, No. 1209 (Tenn. Crim. App. at Knoxville, May 26, 1989), perm. to appeal denied, (Tenn. Oct. 2, 1989) (citing C. TORCIA, WHARTON'S CRIMINAL EVIDENCE § 416 (4th ed.)). We find no abuse of discretion by the trial court in permitting the introduction of Cooper's testimony on redirect examination. This issue is without merit.

Next, the appellant challenges the trial court's ruling which limited his cross-examination of State's witness, Dr. Lisa Forman, an expert in the field of DNA analysis. Forman testified that, in the present case, a Southern Appalachian database was not used in determining a frequency ratio. Moreover, in response to the challenge of "genetic inbreeding" in the Appalachian area, she testified that she doubted the veracity of the stereotype associated with the region and that, although "it would not be inappropriate to screen people from this area", she does not believe that inclusion of such a database would change the results of Cellmark's calculations. The appellant asserts that another Cellmark employee, Dr. Charlotte Word, testified as an expert witness in an Ohio courtroom that Cellmark did not employ an Appalachian database and, therefore, she would be very concerned about the reliability of any projections using Cellmark's existing databases. He argues that the trial court committed reversible error by not permitting him to impeach Dr. Forman with the testimony of her co-employee, Dr. Word. In support of his position, the appellant contends that "[Cellmark] was the witness and that the only authority Forman or Cooper had was to speak about what the lab collectively produced."

Impeachment of an expert witness is governed, generally, by Tenn.R.Evid. 616 (bias or prejudice), Tenn.R.Evid. 618 (learned treatise), and Tenn.R.Evid. 613 (prior inconsistent statement). However, the appellant

attempts to create a right of impeachment based upon alleged conflicting positions of experts within the scope of their common employment. This argument is misplaced. Again, the trial court has the discretion to impose reasonable limits on cross-examination and, we will only find error when that discretion has been abused. See Barnard, 899 S.W.2d at 624. In determining whether limitations on cross-examination of government witnesses are so severe as to amount to a violation of the Confrontation Clause, the reviewing court must ascertain "whether the jury was already in possession of sufficient information to make a discriminating appraisal of the particular witness' possible motives for testifying falsely in favor of the government."³¹ United States v. Christian, 786 F.2d 203, 213 (6th Cir. 1986) (citation omitted); see also United States v. Harris, No. 95-4356 (6th Cir. July 1, 1997). From the facts before us, we find no abuse of discretion or infringement of the appellant's right to confrontation. The proffered statements of the non-testifying witness, Dr. Word, were clearly inadmissible hearsay. Moreover, the expert, in this case, was Dr. Forman, not Cellmark Diagnostic. A business entity cannot be qualified as an expert, rather an individual may be qualified as an expert through his or her employment with that entity.³² See Tenn.R.Evid. 702. This issue is without merit.

VII. Sentencing

In his final issue, the appellant alleges that the trial court erred by imposing the maximum sentences for his convictions for aggravated kidnapping and aggravated sexual battery and by ordering that all three sentences be

³¹The Confrontation Clause only guarantees "an opportunity for effective cross-examination, not cross-examination that is effective in whatever way, and to whatever extent, the defense might wish." Delaware v. Fensterer, 474 U.S. 18, 20, 106 S.Ct. 292, 294 (1985) (citation omitted).

³²To be qualified as an expert, one must be particularly skilled, learned, or experienced in a science, art, trade, business, profession or vocation. Otis v. Cambridge Mut. Fire Ins. Co., 850 S.W.2d 439 (Tenn. 1992).

served consecutively.

Review, by this court, of the length, range, or manner of service of a sentence is *de novo* with a presumption that the determination made by the trial court is correct. Tenn. Code Ann. § 40-35-401(d)(1990). This presumption only applies, however, if the record demonstrates that the trial court properly considered relevant sentencing principles. State v. Ashby, 823 S.W.2d 166, 169 (Tenn. 1991). In making our review, this court must consider the evidence heard at trial and at sentencing, the presentence report, the arguments of counsel, the nature and characteristics of the offense, any mitigating and enhancement factors, the appellant's statements, and the appellant's potential for rehabilitation. Tenn. Code Ann. §§ 40-35-102, -103(5), -210(b) (1990); see also State v. Byrd, 861 S.W.2d 377, 379 (Tenn. Crim. App. 1993) (citing Ashby, 923 S.W.2d at 168). The burden is on the appellant to show that the sentence imposed was improper. Sentencing Commission Comments, Tenn. Code Ann. § 40-35-401(d).

A. Enhancement and Mitigating Factors

At the conclusion of the sentencing hearing, the trial court found five enhancement factors and three non-statutory mitigating factors applicable and imposed the maximum twelve year sentences for each conviction. The enhancing factors found are as follows:

- (a) Tenn. Code Ann. § 40-35-114(5) - The appellant treated the victim with exceptional cruelty;
- (b) Tenn. Code Ann. § 40-35-114(6) - The personal injuries inflicted upon the victim were particularly great;
- (c) Tenn. Code Ann. § 40-35-114(7) - the offense involved a victim and was committed to gratify the appellant's desire for pleasure or excitement;

(d) Tenn. Code Ann. § 40-35-114(9) - The appellant possessed and employed a deadly weapon during the commission of the offense; and

(e) Tenn Code Ann. § 40-35-114(10) - The appellant had no hesitation about committing a crime when the risk to human life was high.

The trial court applied all five factors to both offenses.

The following mitigating factors were found:

Tenn. Code Ann. § 40-35-113(13):

1. The appellant did not have a significant history of criminal convictions at the time of the present offenses;
2. The appellant had obligations to his child; and
3. The appellant served in the National Guard.

The appellant contends that any factor involving bodily injury is not applicable to the aggravated kidnapping conviction since that element was necessarily included within the offense. Additionally, he argues that factor (7) also is not applicable to the aggravated kidnapping conviction. The State concedes that factor (7), committed to satisfy the appellant's desire for pleasure or excitement, is inapplicable to either offense. We agree.

Initially, we note that enhancement factors cannot be elements of the offense charged. Tenn. Code Ann. § 40-35-114. The trial court applied factor (6), that the victim's injuries were particularly great, to the appellant's conviction for aggravated kidnapping and aggravated sexual battery. The appellant now argues that the court erred in applying this factor. See State v. Nix, No. 03C01-9406-CR-00211(Tenn. Crim. App. at Knoxville, Nov. 21, 1995); State v. Nunley, No. 01C01-9309-CC-00316 (Tenn. Crim. App. at Nashville, Feb. 2, 1995), perm. to appeal denied concurring in results only, (Tenn. May 8, 1995). Aggravated kidnapping, in the present case, requires that the defendant committed the act of "false imprisonment, as defined in §39-13-302, with the intent to inflict serious

bodily injury. . . ." Tenn. Code Ann. § 39-13-304. "Proof of serious bodily injury will always constitute proof of particularly great injury." State v. Jones, 883 S.W.2d 597, 602 (Tenn. 1994). Thus, factor (6) may not be used to enhance the appellant's sentence for aggravated kidnapping. However, aggravated sexual battery requires that the defendant made unlawful sexual contact with the victim and caused only bodily injury to the victim. Tenn. Code Ann. § 39-13-504 (a)(2). If the proof supports a finding that the personal injuries were particularly great, factor (6) is applicable to sexual battery cases. See State v. Kissinger, 922 S.W.2d 482, 488 (Tenn. 1996). The evidence establishes that the physical injuries to the victim were particularly great. The trial court properly applied factor (6) in enhancing the appellant's sentence for aggravated sexual battery.

Accordingly, upon *de novo* review, we conclude that the trial court properly applied factors (5), the appellant treated the victim with exceptional cruelty, Tenn. Code Ann. § 40-35-114(5)³³; (9), the appellant possessed and employed a deadly weapon during the commission of the offense, Tenn. Code Ann. § 40-35-114(9); and (10), the appellant had no hesitation about committing a crime when the risk to human life was high, Tenn. Code Ann. § 40-35-114(10),³⁴ to both offenses. However, factor (6) is only applicable to the conviction for aggravated sexual battery.

Additionally, upon *de novo* review, we find factor (1), that the defendant has a previous history of criminal convictions or criminal behavior, Tenn. Code

³³See State v. Poole, 945 S.W.2d 93 (Tenn. 1997).

³⁴Our supreme court held, in Jones, 883 S.W.2d at 602-603, that enhancement factor (10) is not inherent in offenses where serious bodily injury is an element of the offense charged. Factor (10) is appropriate where the conduct of the person has caused or increased risk either to human life in general or to the victim in particular and risk to human life is not an element of the offense. State v. Fox, No. 03C01-9503-CR-00061 (Tenn. Crim. App. at Knoxville, June 21, 1996) (citations omitted). We conclude that stabbing the victim multiple times, resulting in her death, and attempting to strangle her created a risk above and beyond that necessarily inherent in the crimes of aggravated kidnapping and aggravated sexual battery.

Ann. § 40-35-114(1), and factor (8), that the defendant has a previous history of unwillingness to comply with the conditions of a sentence involving release in the community, Tenn. Code Ann. § 40-35-114(8), applicable to both offenses. The appellant was convicted of driving under the influence in 1988. He admitted to the use of marijuana, although he denied he had a drug dependency. See State v. Massey, 757 S.W.2d 350, 352 (Tenn. Crim. App. 1988). See, e.g., State v. Parsons, No. 01C01-9601-CC-00043 (Tenn. Crim. App. at Nashville, Jan. 30, 1997) (criminal behavior based upon use of marijuana). After the commission of the instant offenses but prior to sentencing, the appellant committed and was convicted of driving under the influence, driving on a revoked license, and possession of marijuana. The appellant admitted to criminal behavior in the assault of Pamela Back. State v. Marshall, 870 S.W.2d 532, 542 (Tenn. Crim. App. 1993). This court has previously held that a sentencing court "can consider criminal convictions or any other criminal behavior which occurred prior to the sentencing hearing as constituting a previous history of criminal convictions or criminal behavior, regardless of whether the convictions or behavior occurred before or after the criminal conduct under consideration." State v. Poole, No. 02C01-9506-CC-00178 (Tenn. Crim. App. at Jackson, Jan. 31, 1996), affirmed by, 945 S.W.2d at 93 (Tenn. May 12, 1997) (citing State v. Waters, No. 01C01-9106-CR-00158 (Tenn. Crim. App. at Nashville, Feb. 20, 1992), perm. to appeal denied, (Tenn. June 22, 1992)). The evidence supports application of factor (1). Consequently, implicit within our finding that the appellant has a previous history of criminal convictions and behavior is our rejection of the trial court's finding, as a mitigating factor, that the appellant does not have a significant history of criminal convictions. Moreover, the record indicates that the appellant received suspended sentences for driving under the influence and driving on revoked license convictions occurring after the instant offenses. Approximately five months after being placed on probation, the appellant was charged with criminal attempt to commit aggravated burglary. Subsequently, his probation was

revoked. Accordingly, factor (8) is also applicable. See State v. Hayes, 899 S.W.2d 175 (Tenn. Crim. App. 1995).

In reference to the trial court's finding of the non enumerated mitigating factor (13), "the appellant's obligation to his child," we hold this factor inapplicable as we are unable to conclude that it is "consistent with the purpose of this chapter." Tenn. Code Ann. § 40-35-113(13). We find no nexus between paternityship and mitigation of punishment. Moreover, support of a dependent is by law an obligation and a duty. See Tenn. Code Ann. § 34-11-102(a) (1996). We find it inappropriate to reward someone for that which they are already under a moral and legal obligation to perform. We agree with the trial court's finding that the appellant's service in the National Guard is a proper mitigating factor. In sum, we find enhancing factors (1), (5), (8), (9), and (10) and one mitigating factor applicable to both offenses. Regarding the aggravated sexual battery conviction, we find the additional enhancing factor that the injuries to the victim were particularly great, 40-35-114(6), applicable.

B. Length of Sentence

The appellant was convicted, as a range I offender, of aggravated kidnapping and aggravated sexual battery, both class B felonies. See Tenn. Code Ann. § 39-13-304(b)(1); Tenn. Code Ann. § 39-13-504(b). Accordingly, he was subject to a sentence "not less than eight nor more than twelve years." Tenn. Code Ann. § 40-35-112(a)(2) (1990). The trial court imposed the maximum sentence, twelve years, for each offense. The appellant now contends that, considering the trial court's misapplication of enhancement factors, the court erred in imposing the maximum sentence within the range to his two convictions.

Regarding the length of a sentence, the presumptive sentence shall be the minimum sentence in the range if there are no enhancement or mitigating factors. Tenn. Code Ann. § 40-35-210(c). Thus, the presumptive sentence for the instant offenses is eight years. However, if there are both enhancement factors and mitigating factors, the court must start at the minimum sentence in the range, enhance the sentence within the range as appropriate for the enhancement factors, and then reduce the sentence within the range as appropriate for the mitigating factors. Tenn. Code Ann. §40-35-210(e).

"The weight to be afforded mitigating and enhancement factors derives from balancing relative degrees of culpability within the totality of the circumstances of the case involved." State v. Moss, 727 S.W.2d 229, 238 (Tenn. 1986). See also State v. Marshall, 870 S.W.2d 532, 541 (Tenn. Crim. App. 1993). There is no particular value "vis-a-vis how many years should be added or subtracted based on the presence of any of these factors." Moss, 727 S.W.2d at 238. Thus, with the purposes of the Sentencing Act in mind, the sentencing court retains the discretion in determining the weight afforded to the applicable factors. Id. at 273. Upon *de novo* review, with full consideration of the applicable enhancers and single mitigator, the presumptive sentence at the minimum of the range, and the nature and circumstances of these offenses, we conclude that the maximum sentences of twelve years are justified for both offenses. This issue is without merit.

C. Consecutive Sentences

Finally, the appellant contends that the trial court erred in ordering his

sentences to be served consecutively. At the conclusion of the sentencing hearing, the court determined that, based upon the appellant's pending charges for the murder of Vicky Sue Metzger and the assault of Pamela Sue Back, the appellant qualified as a "dangerous offender," Tenn. Code Ann. § 40-35-115(b)(4) (1990), and imposed consecutive sentences. The appellant contends that the trial court's consideration of the pending criminal charges for purposes of imposing consecutive sentences was error.

If a defendant is convicted of more than one criminal offense, the court may order the sentences to run consecutively provided that the defendant meets at least one of the criteria enumerated in Tenn. Code Ann. § 40-35-115. In the present case, the trial court imposed consecutive sentences based upon the appellant's classification as a dangerous offender. Thus, we must determine whether the appellant qualifies as a "dangerous offender." Tenn. Code Ann. § 40-35-115(b)(4).

In Gray v. State, 538 S.W.2d 391, 393 (Tenn. 1976), our supreme court held that "[a] defendant may be classified as a dangerous offender if the crimes *for which he is convicted* indicate that he has little or no regard for human life, and no hesitation about committing a crime in which the risk to human life is high." (emphasis added). See also Tenn. Code Ann. § 40-35-115(b)(4); State v. Wilkerson, 905 S.W.2d 933, 937 (Tenn. 1995). Again, the trial court relied exclusively upon the charges pending against the appellant in classifying him as a "dangerous offender." The mere fact that a charge is pending, without more, furnishes neither evidence of criminal conduct nor proof that the defendant is a dangerous offender. Thus, consideration of the pending murder indictment and the related charges for purposes of consecutive sentencing was improper. Rather, the focus remains upon the inherently dangerous nature of the instant offenses. Gray, 538 S.W.2d at 393.

Notwithstanding the trial court's improper consideration of the pending charges, upon *de novo* review, we conclude that the appellant is a "dangerous offender." See Gray, 538 S.W.2d at 393. The appellant forcibly abducted the victim from her employment, transporting her into the adjoining county. He committed a sexual battery upon his victim. The medical report indicates evidence of ligature strangulation in addition to seven stab wounds to her torso, resulting in death. From these facts, it is obvious that the appellant's "behavior indicates little or no regard for human life and no hesitation about committing a crime in which the risk to human life is high." Tenn. Code Ann. 40-35-115(b)(4).

However, this classification alone will not justify consecutive sentencing. Wilkerson, 905 S.W.2d at 938. "The proof must also establish that the terms imposed are reasonably related to the severity of the offenses committed and are necessary in order to protect the public from further criminal acts by the offender." Id. In the present case, we find that the aggregate sentences are reasonably related to the severity of the offenses and are necessary to protect the public from further criminal acts by the appellant. Accordingly, the appellant's sentences are ordered to run consecutively.

VIII. Conclusion

For the foregoing reasons, we affirm the judgment of convictions and the sentences imposed for the offenses of first degree murder, aggravated kidnapping, and aggravated sexual battery.

DAVID G. HAYES, Judge

CONCUR:

GARY R. WADE, Judge

CURWOOD WITT, Judge