Supreme Court of Florida

THURSDAY, JUNE 5, 1997

ROBERT JAMES BRIM, Petitioner,

vs.

STATE OF FLORIDA, Respondent.

CASE NO. 85,596
2d DCA NOS. 93-00860, 93-00863
& 93-00864

The Motion for Rehearing filed by Respondent, having been considered in light of the revised opinion, is hereby denied.

A True Copy

  TEST:

Sid J. White
Clerk Supreme Court.

JB

cc: Hon. William A. Haddad, Clerk
Hon. Richard L. Ake, Clerk
Hon. Debra K. Behnke, Judge
Mr. Dale E. Tarpley
Mr. Richard L. Polin
Mr. Robert J. Krauss
Ms. Jennifer Y. Fogle

Supreme Court of Florida

ROBERT JAMES BRIM,
Petitioner,

vs.

STATE OF FLORIDA,
Respondent.

No. 85,596

REVISED OPINION
[January 16, 1997]

OVERTON, J.

We have for review Brim v. State, 654 So. 2d 184 (Fla. 2d DCA 1995). The Second District Court of Appeal certified that its decision conflicts with the First District Court of Appeal's decision in Vargas v. State, 640 So. 2d 1139 (Fla. 1st DCA 1994), quashed on other grounds, 667 So. 2d 175 (Fla. 1995). We have jurisdiction. Art. V, § 3(b)(4), Fla. Const. In our decision quashing Vargas, we did not reach the portion of the district court opinion that addressed the admissibility of DNA population frequency statistics. The First District, in its Vargas ruling, decided that DNA population frequency statistics must satisfy the test for new or novel scientific evidence announced in Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).[1] The Second

District, in the instant case, ruled that DNA population frequency statistics do not have to satisfy the Frye test and, consequently, we are again asked to define the proper standard with which to determine the admissibility of DNA population frequency statistics. We today clarify and emphasize that the DNA testing process consists of two distinct steps. In Hayes v. State, 660 So. 2d 257 (Fla. 1995), we took judicial notice that DNA methodology conducted properly would satisfy the Frye test. Id. at 264. This first step of the DNA testing process relies upon principles of molecular biology and chemistry. In oversimplified terms, the results obtained through this first step in the DNA testing process simply indicate that two DNA samples look the same. A second statistical step is needed to give significance to a match. The need for this

---

[1] The Frye court ruled:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages

> is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923).

second step is explained as follows by the National Research Council (NRC)[2] :

> The insistence on quantitative estimation has been fueled by the observation in the 1992 report (p 74) that "[t]o say that two patterns match, without providing any scientifically valid estimate (or, at least, an upper bound) of the frequency with which such matches might occur by chance, is meaningless." See, e.g., State v. Carter, 246 Neb. 953, 524 N.W.2d 763, 783 (1994)(quoting 1992 report); Kaye 1995.
>
> Certainly, a judge's or juror's untutored impression of how unusual a DNA profile is could be very wrong. This possibility militates in favor of going beyond a simple statement of a match, to give the trier of fact some expert guidance about its probative value. As noted above, however, there are a variety of procedures--qualitative as well as quantitative--that might accomplish this objective.
>
> . . . .
>
> Except for strong claims of uniqueness, purely qualitative presentations suffer from ambiguity. Professional forecasters, physicians, science writers, students, and soldiers show high variability in translating verbal probability expressions to numerical expressions (Mosteller and Youtz 1990; Wallsten and Budesco 1990). Judges and jurors are likely to show a similar variability in interpreting the meaning of such verbal expressions. To help a court or jury to understand the importance of a match, most experts provide quantitative, rather than qualitative, estimates of the frequency of an incriminating profile in one or more races or an upper bound on the frequency.

Committee on DNA Forensic Science & Commission on DNA Forensic Science, National Academy of Sciences, The Evaluation of Forensic DNA Evidence (Prepublication Copy) at 6-24 - 6-26 (1996) (footnotes omitted).

This second step of the DNA testing process does not rely upon principles of molecular biology or chemistry. Instead, the calculation of population frequency statistics is based on principles of statistics and population genetics. Accordingly, calculation techniques used in determining and reporting DNA population frequencies must also satisfy the Frye test. It is clear that the DNA testing process consists of two distinct steps and that both steps must satisfy the requirements of Frye. To the extent that the district court decision determines that DNA population frequency statistics need not satisfy a Frye test, it is disapproved.

Facts

The record reflects that Robert James Brim broke into the homes of three different women. Numerous charges were filed, including sexual battery, armed burglary of a dwelling, and robbery. Only two of the three cases are relevant in this review.[3] In one, Brim was convicted by a jury of two counts of sexual battery, one count of robbery, and one count of burglary of a dwelling with assault or

---

[2]The National Research Council was organized by the National Academy of Sciences in 1916.

[3]In the third case Brim pleaded no contest to misdemeanor battery and burglary of a dwelling with an assault. The blood and saliva samples did not figure heavily in the case.

battery. Brim's motion to exclude DNA evidence was denied. In the second, Brim pleaded no contest to an armed burglary and sexual battery. There, Brim reserved the right to appeal the trial court's rulings on his motion to exclude DNA evidence.

During the course of Brim's appeal, the state of science has significantly changed. At the time of Brim's district court appeal, the NRC's 1992 report[4] was a strong influence on matters relating to DNA testing. The NRC has recently issued its updated report[5] incorporating recent developments in the science of DNA testing.

On appeal, the Second District confronted the problem that arises when the scientific community is split as to the proper approach for reporting results from the DNA testing process. The district court acknowledged that the NRC, in 1992, had recommended the use of a "modified ceiling principle" in the calculation of DNA population frequency statistics. The district court further noted that the calculation recommended by the NRC was thought to produce more conservative results than the calculation used by law enforcement in this case. In fact, the difference was substantial because "the FBI procedure generated a probability that only one out of 1.4 billion whites and one out of 2.5 million blacks would share the DNA code with the perpetrator of the offense [whereas] [t]he modified ceiling principle indicated that only one of just over 9,000 individuals would share the perpetrator's genetic DNA code." Brim, 654 So. 2d at 185. Finally, the Second District reached a dual conclusion. It ruled that there was no need for population frequency statistics

to satisfy the Frye test. However, it also ruled, in the alternative, that both of the calculations presented in this case satisfied the Frye test.

The dual conclusion reached by the district court requires us to clarify two distinct issues. First, we reiterate that new or novel scientific evidence presented from both steps of the DNA testing process must satisfy the Frye test. Second, we address whether multiple statistical calculations might simultaneously be able to satisfy the Frye test.

Analysis

DNA evidence is an important scientific tool that can assist in the identification of perpetrators of criminal offenses and, consequently, substantially improve the judicial process in a search for the truth. We have previously taken judicial notice that the first step of the DNA testing process, if properly conducted, will satisfy the Frye test. Hayes, 660 So. 2d at 264. It is important to recognize, though, that DNA testing is a two-step process. The fact that a match is found in the first step of the DNA testing process may be "meaningless" without qualitative or quantitative estimates demonstrating the significance of the match. We acknowledge that arguments have been made that the statistics or population genetics used in calculating population frequency estimates are not new or novel scientific evidence and, consequently, should not be subjected to a Frye analysis. We disagree. In 1992, the NRC made the following observation:

Unlike many of the technical aspects of DNA typing that are validated by daily use in hundreds of laboratories, the extraordinary population-frequency estimates sometimes reported for DNA typing do not arise in research or medical applications that would provide useful validation of the

---

[4]Committee on DNA Technology and Forensic Science, National Academy of Sciences, DNA Technology in Forensic Science (1992).

[5]Committee on DNA Forensic Science, supra, p.2.

-3-

frequency of any particular person's DNA profile. Because it is impossible or impractical to draw a large enough population to test calculated frequencies for any particular DNA profile much below 1 in 1,000, there is not a sufficient body of empirical data on which to base a claim that such frequency calculations are reliable or valid per se.

DNA Technology in Forensic Science at 77. We heed the NRC's warning that we should be cautious when using standard statistical principles in the field of DNA testing. In the absence of an independent validation method, we find that the Frye test is appropriate when using statistics or population genetics to calculate population frequency statistics. Consequently, the techniques and methods utilized in both steps of the DNA testing process must satisfy the Frye test.

We next address the problem that arises when two or more population frequency calculations seemingly satisfy the Frye test. For instance, in this case the district court found that both the "modified ceiling principle" method and the FBI method satisfied the Frye test. We start by emphasizing again that the Frye test is utilized in Florida to guarantee the reliability of new or novel scientific evidence. E.g., Stokes v. State, 548 So. 2d 188 (Fla. 1989). Despite the federal adoption of a more lenient standard in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 US. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993),[6] we have

maintained the higher standard of reliability as dictated by Frye. E.g., Ramirez v. State, 651 So. 2d 1164 (Fla. 1995). This standard requires a determination, by the judge, that the basic underlying principles of scientific evidence have been sufficiently tested and accepted by the relevant scientific community. To that end, we have expressly held that the trial judge must treat new or novel scientific evidence as a matter of admissibility (for the judge) rather than a matter of weight (for the jury). In Ramirez, we wrote:

> In utilizing the Frye test, the burden is on the proponent of the evidence to prove the general acceptance of both the underlying scientific principle and the testing procedures used to apply that principle to the facts at hand. The trial judge has the sole responsibility to determine this question. The general acceptance under the Frye test must be established by a preponderance of the evidence.

Id. at 1168 (emphasis added).

The district court expressed dissatisfaction with such a rule when it wrote that "[i]t may be that a general relevancy test, one that does not limit the admissible scientific evidence to that reflected by one unanimous view, would be a more preferable, and perhaps realistic, test in such situations." Brim, 654 So. 2d at 187. It explained that to do otherwise would be to throw the "baby out with the bath water." We disagree with that assessment for two reasons. First, the district court mischaracterizes the meaning of general acceptance. It is clear that

---

[6]The Daubert Court ruled that the adoption of Federal Rule of Evidence 702 superseded the Frye test. That rule reads:

If scientific, technical, or other specialized knowledge will 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 thereto in the form of an opinion or otherwise.

-4-

scientific unanimity is not a precondition to a finding of general acceptance in the scientific community. People v. Dalcollo, 669 N.E.2d 378, 387 (Ill. App. Ct. 1996). Instead, general acceptance in the scientific community can be established "if use of the technique is supported by a clear majority of the members of that community." People v. Guerra, 690 P.2d 635, 656 (Cal. 1984). "Of course, the trial courts, in determining the general acceptance issue, must consider the quality, as well as quantity, of the evidence supporting or opposing a new scientific technique. Mere numerical majority support or opposition by persons minimally qualified to state an authoritative opinion is of little value . . . ." People v. Leahy, 882 P.2d 321, 336-37 (Cal. 1994). Therefore, while a "nose count" is not alone sufficient to establish general acceptance in the scientific community, such acceptance likewise need not be predicated upon a unanimous view.   Second, the district court overdramatizes the results our decision will produce. It certainly is true that two conflicting principles or theories cannot simultaneously satisfy the Frye test. In such situations, either one principle or theory satisfies the Frye test and the other does not or, in the alternative, both principles or theories fail to satisfy the Frye test. In a case such as this, however, more conservative modifications to the principle or theory found to satisfy the Frye test may also be admitted. We offer the following example. In 1992, the NRC responded to criticisms about the use of the "product rule" in the calculation of population frequency statistics.[7]   It was

_____

[7]The "product rule" is a traditional calculation used by statisticians and population geneticists to calculate population frequency statistics. It is well explained in the 1992 NRC report. A more detailed explanation of the calculations performed in creating population frequency statistics is set out in the 1996 NRC report.

alleged that the traditional "product rule" did not adequately adjust for the possibility of population substructures. E.g., R.C. Lewontin and D.L. Hartl, Population Genetics in Forensic DNA Typing, 254 Science 1745-50 (1991). The NRC's response was the creation of a "ceiling principle" and a "modified ceiling principle." This "ceiling principle" approach resulted in extremely conservative calculations meant to prevent the traditional "product rule" from underestimating a random match if population substructures in fact existed. DNA Technology in Forensic Science at 80. After the issuance of its 1992 report, the NRC was criticized for endorsing "ceiling principles" that were considered unduly conservative. See generally The Evaluation of Forensic DNA Evidence at 5-31. Subsequently, the NRC formed another committee to update its 1992 report. Id. at ES-1. The 1996 NRC report now disavows the "ceiling principles" and finds them to be unnecessary. Id. at 5-33. In their stead, it suggests new calculations that are still scientifically reliable. Does the change in the NRC's position mean that the "ceiling principles" no longer satisfy the Frye test? The answer is clearly no.

We restate the relevant language from Frye:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained

-5-

Id. at 1014 (emphasis added). We reiterate that we should not treat population frequency statistics as an extension of the first step in the DNA testing process. Those statistics are a distinct step in the DNA testing process. The district court reasoned incorrectly when it found that both statistical reporting methods in this case were admissible because the chemical and biological techniques used in the first step of the DNA testing process satisfied the Frye test. See Brim, 654 So. 2d at 187. It is improper to label calculations created with principles of statistics and population genetics as simply deductions from a methodology based on chemistry and molecular biology. The district court's result, however, is correct. We may allow multiple reasonable deductions when all are based on generally accepted principles of population genetics and statistics. At the time this case was tried, processes that did not utilize the "ceiling principles" might not have satisfied the Frye test because those calculations did not take into account the possibility of population substructures. A sizeable portion of the scientific community speculated that failure to account for population substructures made "product rule" statistics unreliable. In 1996, that view changed and, therefore, the "ceiling principles" are no longer necessary. We do not find, though, that they are unreliable. While the results obtained through the use of "ceiling principles" might be unduly conservative, the scientific principles underlying the calculations are still generally accepted. By analogy, the fact that we now have calculators does not make long-hand arithmetic unreliable. If anything, calculators only make such long-

hand work unnecessary. Necessity, though, is not the concern of the Frye analysis.[8]

---

[8]The State argues in its motion for rehearing that the ceiling principles are not only unnecessary but indeed unreliable. We disagree. The ceiling principles were created by members of the scientific community to guarantee that, in the event population substructures might exist, population frequency statistics would not be reported in an unfairly liberal manner. The ceiling principles were formulated after much discussion and contemplation. We acknowledge that many scientists may now argue that the assumptions made by those creating the ceiling principles were unduly cautious. We cannot agree, though, that the ceiling principles are simply arbitrary. They were created for a valid reason and there can be no argument that the results produced with the ceiling principles are any more unreliable than the results produced by a counting method. The counting method compares a sample with only a pool of other complete samples. If there is no absolute match, the statistic is reported in terms of pool size. There are no assumptions made about principles of population genetics. The results obtained are extremely conservative. Indeed, as in the case of ceiling principles, scientists also argue that such a method is unduly cautious in light of today's knowledge. It seems to us that both the ceiling principles and the counting method may be unnecessary. Neither is unreliable.

Such a ruling does not open the flood gates to the admissibility of numerous different statistics at trial. We foresee that, at most, a trial court might admit a statistic arrived at with the counting method, a statistic calculated with ceiling principles, and one (or more) statistic(s) computed with the currently accepted calculation. The ceiling principles can be distinguished from arbitrary methods devised to present more conservative statistics. As opposed to random methods (however conservative and, therefore, arguably reliable) contrived to possibly overwhelm or confuse juries, the ceiling principles have enjoyed widespread usage nationwide in the recent past. Indeed, the State itself argues in its motion for rehearing that the "fact that the Council has now found the rationale on which it justified use of [the ceiling] principle to be unnecessary should not, either on direct appeal or through post-conviction proceedings, affect the legal validity of the cases tried utilizing it." It is clear that a complete disavowal of the ceiling principles would create more problems than it would solve. The statistics created with the ceiling principles are reliable, if conservative. We see no reason, at this point in time, to find that the ceiling

Importantly, the 1996 NRC report does not endorse the admission of all DNA population frequency calculations. It recommends specific calculation methods. As a result, the trial judge still plays an important role in determining the admissibility of population frequency statistics under Frye. While we acknowledge that multiple statistics might be presented to the jury, the underlying principles used to calculate those statistics must be generally accepted in the relevant scientific community.

How do these holdings affect the convictions in Brim's case? Regrettably, in view of the recent changes that have occurred in this area of DNA forensic testing, we conclude that this case must be sent back for a limited evidentiary hearing. First, we agree with the First District's conclusion in Vargas that the standard of review in cases such as these should be de novo. Vargas, 640 So. 2d at 1144. This means that the trial judge's ruling will be reviewed as a matter of law rather than by an abuse-of-discretion standard. In Vargas, the State took the position that the district court should evaluate the trial court's Frye ruling under an abuse-of-discretion standard. Such a standard would prohibit an appellate court from considering any scientific material that was not part of the trial record in its determination of whether there was general acceptance within the relevant scientific community. We find that the abuse-of-discretion standard is incorrect. Justice

McMorrow of the Supreme Court of Illinois recently wrote a special concurrence addressing this issue. He wrote:

> There are good reasons why the determination of general acceptance in the scientific community should not be left to the discretion of the trial court. Foremost is the fact that the general acceptance issue transcends any particular dispute. As one court put it, "[t]he question of general acceptance of a scientific technique, while referring to only one of the criteria for admissibility of expert testimony, in another sense transcends that particular inquiry, for, in attempting to establish such general acceptance for purposes of the case at hand, the proponent will also be asking the court to establish the law of the jurisdiction for future cases." Jones v. United States, 548 A.2d 35, 40 (D.C. App. 1988). Application of less than a de novo standard of review to an issue which transcends individual cases invariably leads to inconsistent treatment of similarly situated claims.

People v. Miller, 670 N.E.2d 721, 739 (Ill. 1996)(McMorrow, J., specially concurring).

Appellate review of a Frye determination will be treated as a matter of law. We must account for the effect the 1996 NRC report would have on the admissibility of the State's population frequency statistics presented in this case.[9] Normally, we anticipate, our

---

principles fail to satisfy the Frye test.

We recognize, however, that there may be times at which new scientific revelations may actually prove older methods unreliable, as opposed to simply unnecessary. In those isolated contexts, the older methods would not satisfy a Frye test. In the usage of ceiling principles, this may occur when the principles are used so infrequently as to make them historical oddities. Such is not the case today in either Florida or the nation as a whole.

[9]We note that the 1996 NRC report recommendations are not being endorsed as the only method able to find general acceptance within the relevant scientific community. We use the report in this context only to indicate that a significant portion of the scientific community may be represented by the shift

review will be capable of dealing with scientific progress such as is represented by the 1996 NRC report. Here, however, we find that this record fails to show complete details of the State's calculation methods. As a result, we cannot properly evaluate whether the methods used to calculate the State's population frequency statistics would satisfy the Frye test in 1996. We must conclude that an evidentiary hearing is needed to obtain the details required to conduct a Frye analysis taking the 1996 NRC report into account.

We caution against reading this conclusion so as to indicate that the State's methods might be problematic. Indeed, there appears to be a high probability that a Frye test will be satisfied in light of the dissipation of the debate over population substructures.

Accordingly, we disapprove the district court opinion insofar as it determines that DNA population frequency statistics need not satisfy a Frye test. Further, we remand this case for a limited evidentiary hearing[10]

---

taken by the 1996 NRC report.

[10]A limited remand of the nature we order today was used in Leahy. The Supreme Court of California was faced with a Frye issue that had to be resolved at the trial court level. It resolved the matter as follows:

> We accept, however, the People's suggestion that an entire retrial of the case may be unnecessary. Instead, we will direct the Court of Appeal to reverse defendant's conviction and remand the case to the trial court for a Kelly [Frye] hearing in accordance with our opinion. If, at the conclusion of the hearing, the trial court concludes that there is sufficient basis to admit the HGN testimony previously presented, the court should reinstate the judgment without reintroducing such testimony. If the trial court determines the HGN evidence inadmissible under Kelly, the court should order a new trial if the People so elect.

Leahy, 882 P.2d at 335. We are essentially doing the

intended to clarify the exact methods used by the State in calculating its population frequency statistics at the time of the plea and trial. The trial court is directed to make factual findings as to the exact method used (at the time of the plea and trial) by the State to calculate its population frequency statistics. The trial court will then issue a new Frye determination based on that method's general acceptance within the relevant scientific community at the time of the hearing. If the trial court finds the methods utilized at trial by the State satisfy the Frye test, the convictions should remain in effect. If the trial court finds to the contrary, a new trial should be granted. Our remand is limited solely to this issue and we direct the hearing be held on this matter within sixty days from the date this opinion becomes final.

It is so ordered.

KOGAN, C.J., and SHAW, GRIMES, HARDING, WELLS and ANSTEAD, JJ., concur.

NOT FINAL UNTIL TIME EXPIRES TO FILE REHEARING MOTION AND, IF FILED, DETERMINED.

Application for Review of the Decision of the District Court of Appeal - Certified Direct Conflict of Decisions
    Second District - Case Nos. 93-00860, 93-00863 & 93-00864

(Hillsborough County)

-8-   same in this case.

James Marion Moorman, Public Defender and
Jennifer Y. Fogle, Assistant Public Defender,
Tenth Judicial Circuit, Bartow, Florida,

for Petitioner

Robert A. Butterworth, Attorney General;
Robert J. Krauss, Senior Assistant Attorney
General, Chief of Criminal Law, and Dale E.
Tarpley, Assistant Attorney General, Tampa,
Florida,

for Respondent