

IN THE CIRCUIT COURT FOR THE EIGHTEENTH JUDICIAL CIRCUIT,  
IN AND FOR SEMINOLE COUNTY, FLORIDA

CASE NO. 12-CF-1083-A

STATE OF FLORIDA,

Plaintiff,

vs.

GEORGE ZIMMERMAN,

Defendant.

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**ORDER EXCLUDING THE OPINION TESTIMONY OF MR. OWEN AND DR. REICH**

The Defendant is charged with one count of second-degree murder in the shooting death of Trayvon Martin ("Martin"). Preceding the shooting, the Defendant made a non-emergency call to law enforcement that was recorded by the agency. While a disturbance was occurring, a citizen made a recorded 911 call during which screams can be heard. Both the State and the Defendant have retained experts to examine these recordings. The State seeks to introduce expert opinion testimony that the screams heard in the 911 call belong to Martin.

The Defendant filed a "Motion for Evidentiary Hearing Regarding Admissibility of Expert Opinion Testimony" seeking to exclude the opinions of the State's experts on the basis that the techniques applied are not generally accepted in the scientific community.<sup>1</sup> The State responded that the techniques used to examine the tapes are

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<sup>1</sup> Florida has followed the Frye test since 1985. See *Bundy v. State*, 471 So. 2d 9, 18 (Fla. 1985), cert. denied, 479 U.S. 894 (1986). However, on May 20, 2013, the Florida Legislature passed H.B. 7015

not new or novel and, therefore, the opinion of their experts regarding the tapes should be allowed into evidence. The Defendant replied that obtaining a reliable comparison between known speech exemplars and short bursts of screaming captured at a distance and recorded in the background of a conversation between two additional speakers is not possible.

A hearing was held on June 6-8, 17, and concluded on June 20, 2013. The State presented testimony from Dr. Alan Reich and Mr. Thomas Owen. The Defendant presented testimony from Dr. Peter French, Dr. Hirotaka Nakasone, Dr. James Wayman, and Dr. George Doddington. All of the witnesses possess credentials in their fields of expertise.<sup>2</sup>

The authoritative case regarding the admissibility of expert testimony on a new and novel scientific principle is *Ramirez v. State*, 651 So. 2d 1164 (Fla. 1995) (*Ramirez II*). *Ramirez II* sets forth a four-step process for trial judges to follow before scientific testimony may be admitted into evidence:

The admission into evidence of expert opinion testimony concerning a new or novel scientific principle is a four-step process ... First, the trial judge must determine whether such expert testimony will assist the jury in understanding the evidence or in determining a fact in issue ... Second, the trial judge must decide whether the expert's testimony is based on a scientific principle or discovery that is "sufficiently established to have gained general acceptance in the particular field in which it belongs" ... This standard, commonly referred to as the "*Frye* test," was expressly adopted by this Court in *Bundy v. State*, 471 So. 2d 9, 18 (Fla. 1985), *cert. denied*, 479 U.S. 894, 107 S.Ct. 295, 93 L.Ed. 2d 269 (1986), and *Stokes*

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changing the standard for new or novel scientific evidence from the *Frye* standard to the *Daubert* standard, which is currently used in Federal cases. See *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). On June 4, 2013, the Governor signed the bill into law with an effective date of July 1, 2013.

<sup>2</sup> The witnesses' curricula vitae have been entered into evidence. See State's Exhibits 1 and 2; Defendant's Exhibits 1-4.

*v. State*, 548 So .2d 188, 195 (Fla. 1989). The third step in the process is for the trial judge to determine whether a particular witness is qualified as an expert to present opinion testimony on the subject in issue. § 90.702, Fla. Stat. (1993). All three of these initial steps are decisions to be made by the trial judge alone ... Fourth, the judge may then allow the expert to render an opinion on the subject of his or her expertise, and it is then up to the jury to determine the credibility of the expert's opinion, which it may either accept or reject.

*Id.* at 1166-67.

It is the second prong of the *Ramirez II* process that is at issue in this case. The question before the Court is whether the methods used by the State's experts to reach their conclusions as to the identity of the person making the screams are "based on a scientific principle or discovery that is 'sufficiently established to have gained general acceptance in the particular field in which it belongs.'" *Id.* at 1167. "When applying the *Frye* test, a court is not required to accept a 'nose count' of experts in the field. Rather, the court may peruse disparate sources ... and decide for itself whether the theory in issue has been 'sufficiently tested and accepted by the relevant scientific community.'" *Id.* at 844.

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 of the case at hand ...The general acceptance under the *Frye* test must be established by a preponderance of the evidence.

*Ramirez II*, 651 So. 2d at 1168.

There are currently three employed methods used in forensic speaker identification. The first and most widely used and accepted was referred to during the hearing as critical listening, aural perception, or auditory phonetic analysis. This is the process whereby a trained expert carefully listens to a sample in an effort to detect

unique qualities, such as vocal pitch, speech rhythms, and accents that can be heard by the unassisted human ear. The second is spectral or acoustic-phonetic analysis which uses computer software to measure fundamental frequency and energy in the spoken words, the results of which are represented in a graphic format. Finally, there is biometric or Gaussian Mixture Model analysis. This method also uses computer software to compare thousands of variables in spoken words to determine whether they were uttered by the same person.

With regard to the evidence in this case, there were some variables that were known, which assisted the witnesses. There were also some environmental variables that hindered the ability of the witnesses to effectively analyze the recordings. As for the known variables, it is undisputed that the speaker in the non-emergency call is the Defendant. This sample contained his "normal voice" uttering spoken words and was used as a control sample upon which to base a speaker comparison. Additionally, the screams in the 911 call were known to be either those of the Defendant or Martin. Some of the environmental variables that hindered the witnesses were that the screams on the 911 call were often overlaid by the voices of the citizen caller or dispatcher, were in the background of the telephone call which reduced the quality of the recording, and the citizen caller was located inside a residence, some distance from the incident, thereby attenuating the sounds.

The State's witness, Mr. Thomas Owen, has been involved in forensic audio work since 1981. He was retained after the shooting by a newspaper to attempt to identify the person(s) screaming in the 911 call.

For the software-reliant analysis, Mr. Owen used software called "Easy Voice," a software program he markets and in which he has a small financial interest. Easy Voice

recommends a sample length of 16 seconds to conduct its analysis. Mr. Owen only isolated seven seconds of screams from the 911 call. The seven second sample was rejected by the Easy Voice software program. To correct this problem, he ran the seven second sample twice (sometimes referred to as "looping"). Based upon conversations with sales representatives for the software manufacturer, he believed looping was an appropriate solution. As part of his technique, he adjusted the pitch of the known spoken voice sample of the Defendant to raise it up to the same pitch as the screams in the 911 tape.

Mr. Owen claims to have conducted an experiment in 1985 which showed that screams can be analyzed using this method. He further testified that comparing screams is not unusual, and that forensic cases involve analyzing screams heard on 911 calls and from black boxes. After analyzing the looped sample he created, Mr. Owen opined that the screams in the 911 tape do not match the Defendant's voice. By process of elimination, he believes that the screams were made by Martin.

According to Mr. Owen, he also "cleaned up" the audio of the Defendant's non-emergency call in an effort to identify a previously unintelligible word. Using audio editing software, he made a determination that the unintelligible word used by the Defendant was "punks."

State witness Dr. Reich has been involved in speech recognition since 1975 and taught at the University of Washington from 1977 until 2000, when he retired to become a consultant. Dr. Reich was also retained by a newspaper to conduct forensic analysis on the tapes in this case. He used the aural perception and acoustic-phonetic analysis methods in analyzing the tapes. He is not familiar with any studies regarding the

comparison of normal speech to screams, but testified that he has conducted such analyses in the past.

With regard to the identity of the person(s) making the screams, Dr. Reich reached the "tentative" conclusion that almost all of the screams heard in the 911 tape were made by Martin. In reaching his conclusion, Dr. Reich assumed the following: the screams could only have been made by one of two people, either Martin or the Defendant; the screams ended upon the gunshot being fired, leading to an inference that the person screaming had been shot; and the frequency of the screams indicated that the speaker's vocal tract had not completely developed, leading to a conclusion that the person had not reached adulthood.

In addition to his opinion about the identity of the person screaming, Dr. Reich testified that he was able to hear words on both calls that have not been heard by any other witness. He identified an unusual speech pattern in the Defendant's non-emergency call and, upon further analysis, claimed to identify several distinct previously unheard words. Similarly, he was able to hear several previously unheard words and statements in the 911 call. Mr. Owen testified that he was able to detect these words by commonly-used digital enhancement and transcription software.

The Defendant presented the testimony of Dr. Hirotaka Nakasone, a senior communications analyst with the FBI. Dr. Nakasone has worked in the field of speech sciences since 1985. Dr. Nakasone opined that identification of the person(s) screaming in the 911 call could not be made because the scientific technology does not exist today. His opinion was based upon a number of factors, one of which was the short duration of usable audio. When other sounds were filtered out of the 911 call, Dr.

Nakasone isolated less than three seconds of useable audio. Most importantly, he also opined that screams are not suitable for comparison with one's normal speaking voice.

Dr. Nakasone testified that the processes of aural perception and spectral analysis are commonly used in the field of speaker identification and generally accepted within the field. He used these techniques in his own analysis of the 911 call. His opinion is that no scientist is able to make a conclusion about the identity of the person(s) screaming in the 911 call given the current state of scientific technology and for a scientist to claim that he or she is able to do so is "disturbing".

Defense witness Dr. French, regarded as an international expert in the field of forensic speech analysis, has worked in the field since the late 1980's. The Court found the testimony of Dr. French to be the most compelling of the witnesses presented.

In Dr. French's opinion, the recorded screams in the 911 call were unsuitable for any type of forensic analysis. When he reviews a sample for suitability, he considers three initial criteria: sound quality, sound duration, and any unusual characteristics of the speech or speaker. He does not require a certain minimum sample length, but the sample must contain enough speech upon which to base a comparison. He testified that if he had received these recordings from law enforcement at the outset of the case, he would have rejected the assignment as it would have been fruitless to undertake the task.

Dr. French testified that there is no basis to compare spoken words to screaming. He explained that screaming under the type of stress present in this case changes the voice in an unpredictable manner and cannot be replicated in laboratory conditions. Moreover, without distinct words there are no characteristics that lend themselves to comparison. A forensic expert cannot hear the variables used with aural comparison in

screams, including the pronunciation of certain phonemes, accents, speech rate, and pitch variations. Dr. French is not aware of any studies that have concluded it is possible to compare normal spoken words to screaming.

After review of the tapes, Dr. French was unable to hear any of the words heard by Dr. Reich. He testified that Dr. Reich's opinions were affected by his prior knowledge of the facts of this case. As those in the field of forensic speech analysis must always be cognizant of this risk, he prefers to conduct blind analyses where he does not know the facts of the case. He also testified that one cannot tell the age of a speaker based upon the sound of his voice. Dr. French's opinions cannot be reconciled with those of Dr. Reich.

Defense witness Dr. George Doddington is an expert in the field of electronic engineering with specialties in speech and speaker recognition since the 1970's. He currently works with NIST, the National Institute of Standards and Technology.<sup>3</sup> As part of his work with NIST, Dr. Doddington formulated a test designed to determine software performance in voice comparison studies. The results from his test indicate that software error rates climb substantially as the recorded sample size is reduced from ninety seconds to ten.

Defense witness Dr. James Wayman, an acoustical engineer with more than 30 years experience, specializes in the effect of the environment on the transmission of sound. Dr. Wayman developed mathematical algorithms for automated speaker recognition, a sub-field of biometrics. He testified that when comparing a known voice exemplar to an unknown sample, both the "speaker conditions" and the "channel conditions" (the factors present in the environment through which the sound travels)

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<sup>3</sup> NIST is a governmental agency that arranges for the evaluation of technology in varied scientific disciplines.

must be the same in each sample before a reliable comparison may be made. Dr. Wayman testified that there was less than one second worth of data (50 or 60 milliseconds) available in each of the screams in the 911 call. In his opinion, the available data is too small to conduct a reliable comparison analysis. He is not aware of any software accepted in the scientific community that would produce reliable comparison results for the sample available in this case. He opined that Mr. Owen's methodologies were not reliable because they did not consider speaker and channel conditions in the analysis. No testimony was presented to establish that the Easy Voice software is designed to factor in speaker and channel conditions. Dr. Wayman also opined that Mr. Owen's methodology was flawed in that his looping of the sample to make it longer did not provide additional information for an adequate comparison.

Dr. Wayman characterized Dr. Reich's methodology as "confusing" and "baffling", because Dr. Reich failed to offer sufficient detail as to exactly what he did to accomplish the comparison. Dr. Wayman testified that speaker effects, channel effects, and the fact that the screams passed through a cell phone all impacted the analysis, and these factors were not accounted for in Dr. Reich's methodology.

Based upon the testimony of the witnesses for both the State and the Defendant, the Court finds and concludes that aural perception and spectral analysis have been widely used for many years and are sufficiently established to have gained general acceptance within the scientific community. While biometric analysis has been available for several years, it is not as widely accepted at this time.

The Court next addresses whether the *application* of the sample from the 911 call to the methodologies used by Mr. Owen and Dr. Reich are sufficiently established to have gained general acceptance in the scientific community. *Ramirez II*, 810 So. 2d at

844. Drs. French, Doddington and Nakasone were “disturbed” by the scientific techniques used by Mr. Owen and Dr. Reich. Drs. French and Doddington went even further to characterize such techniques as “ridiculous”.

It is well established that “[a] bald assertion by the expert that his deduction is premised upon well-recognized scientific principles is inadequate to establish its admissibility if the witness's application of these principles is untested and lacks indicia of acceptability.” *Id* at 844. This is especially true if the proponent(s) of the scientific principles have a personal stake in its acceptance. The State did not offer any disinterested or impartial witness to establish that the scientific principles utilized by Mr. Owen and Dr. Reich have gained general acceptance in the scientific community. Both Mr. Owen and Dr. Reich testified in support of their own technologies and techniques. They have an interest in the outcome of this issue because it is their methodologies being tested. Mr. Owen acknowledged that he markets and owns a small financial interest in the software program he utilized as a basis for his opinion.

Although the aural perception and spectral analysis are not new or novel, their application by the State’s witnesses to the samples from the 911 call in this case is a scientific technique that is new and novel. There is no competent evidence that the scientific techniques used by Mr. Owen and Dr. Reich are generally accepted in the scientific field. There is no evidence to establish that their scientific techniques have been tested and found reliable. The Court accepts the opinions of Drs. French, Doddington, Nakasone and Wayman that reliable comparison of normal speech to the screams in the 911 call is not possible. “The trustworthiness of expert scientific testimony is especially important because oftentimes ‘[t]he jury will naturally assume that the scientific principles underlying the experts conclusions are valid.’” *Ramirez III*,

at 844, citing *Flanagan v. State*, 625 So.2d 817, 828 (Fla. 1993). “The purpose of *Frye* is to ensure the reliability of expert testimony.” *Marsh v. Valyou*, 977 So.2d 543 (Fla. 2007). The scientific methodologies and techniques used by Mr. Owen and Dr. Reich are not reliable as they are not sufficiently established and not generally accepted in the scientific community.

The proponent of opinion testimony that espouses new or novel scientific theories bears the burden of establishing by a preponderance of the evidence the general acceptance of the underlying scientific principles and methodology. *Ramirez II*, 651 So. 2d at 1168; *Marsh v. Valyou*, 977 So. 2d 543 (Fla. 2007). The State failed to carry its burden.

The Court now addresses the testimony of Dr. Reich regarding words that he claims to hear by the use of amplification that have not been heard by any other witness. The defense seeks a determination as to whether the probative value of this testimony would substantially be outweighed by the danger of unfair prejudice under Fla. Stat. §90.403.<sup>4</sup> The Court notes that Dr. Reich issued at least two reports on his findings in this case, one for a newspaper and one for the State. The testimony presented to the Court indicated there are significant differences between the two reports as to what Dr. Reich heard in the recorded calls. Dr. Reich did not offer an explanation for the discrepancies.

None of the other witnesses were able to hear the words heard by Dr. Reich. The Court heard testimony about “listener bias,” where a listener with a biased outlook,

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<sup>4</sup> §90.403, Fla. Stat. (2013) provides in pertinent part, “Relevant evidence is inadmissible if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of issues, misleading the jury, or needless presentation of cumulative evidence.”

often due to knowledge of the underlying facts, makes conclusions to support his or her preconceived notions. It was hypothesized that Dr. Reich, who took up the case based upon personal interest, subconsciously wanted to hear identifiable words. The Court finds that Dr. Reich's testimony regarding the amplified tapes would confuse issues, mislead the jury and, therefore, should be excluded from trial.

Based upon the above, it is **ORDERED:**

That the opinion testimony of Mr. Owen and Dr. Reich are hereby excluded from trial.

This order does not prevent the parties from playing the tapes at trial or from calling witnesses familiar with the voice of the Defendant or Martin to testify regarding the identity of the person(s) making the screams.

**DONE** in chambers at Sanford, Seminole County, Florida this 22 day of June, 2013.

  
**DEBRA S. NELSON, Circuit Judge**

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