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# Admissibility of Scientific Evidence: Voice Spectrography

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**EVIDENCE****ADMISSIBILITY OF SCIENTIFIC EVIDENCE:****VOICE SPECTROGRAPHY**

**I**N *STATE V. WILLIAMS*<sup>1</sup> the Ohio Supreme Court addressed for the first time the issue of admissibility of voice analysis as identification evidence.<sup>2</sup> The court ruled that expert testimony and exhibits based on voice spectrography analysis are admissible if they are relevant and will assist the trier of fact.<sup>3</sup> *Williams* also pronounces how Ohio courts should evaluate the admissibility of scientific evidence.

The admissibility of identification evidence based upon spectrographic voice analysis varies from jurisdiction to jurisdiction.<sup>4</sup> Voice spectrography is premised on the scientific assumption that no two human voices are alike.<sup>5</sup> Developed specifically to record voices,<sup>6</sup> the spectrograph is an electromagnetic instrument which analyzes sound and disperses it onto paper in graphic array of time, frequency, and intensity.<sup>7</sup> This picture of the voice's components is called a spectrogram, or voiceprint.<sup>8</sup> The spectrograph operator compares a known voice

<sup>1</sup>4 Ohio St. 3d 53, 446 N.E.2d 444 (1983).

<sup>2</sup>By means of voice spectrography, an expert compares a known voice (defendant's) with an unknown voice, the latter having been somehow recorded during, or in relation to, a crime. See *infra* notes 5-10 and accompanying text.

<sup>3</sup>4 Ohio St. 3d at 58, 446 N.E.2d at 447.

<sup>4</sup>See, e.g., *United States v. Franks*, 511 F.2d 25 (6th Cir.), cert. denied, 422 U.S. 1042 (1975)(admissible); *United States v. Williams*, 583 F.2d 1194 (2d Cir. 1975), cert. denied, 439 U.S. 1117 (1979)(admissible); *People v. Kelly*, 17 Cal. 3d 24, 549 P.2d 1240, 130 Cal. Rptr. 144 (1976)(not admissible); *State v. Williams*, 388 A.2d 500 (Me. 1978)(admissible); *Reed v. State*, 283 Md. 374, 391 A.2d 364 (1978)(not admissible); *Commonwealth v. Lykus*, 367 Mass. 191, 327 N.E.2d 671 (1975)(admissible); *People v. Tobey*, 401 Mich. 141, 257 N.W.2d 537 (1977)(not admissible).

<sup>5</sup>Human speech occurs through a complex combination of physiological and mechanical characteristics which typically stabilize after puberty. Giansiracusa, *Voiceprints in the Courtroom — Scientific and Evidentiary Problems*, 21 ARIZ. L. REV. 1163, 1164 (1979). For an excellent discussion of the hows, whys and uses of voice spectrography see O. TOSI, *VOICE IDENTIFICATION, THEORY AND LEGAL APPLICATIONS* (1979). Evidentiary application of each voice's uniqueness is not limited to spectrography. For example, the Federal Rules of Evidence allow a lay witness to testify as to the identity of an unknown speaker, by the sound of his voice. FED. R. EVID. 901(b)(5). Similarly, the law recognizes the uniqueness of the human body in other types of evidence, i.e. fingerprints, hair samples, and blood samples, See Comment, *Voice Spectrogram Analysis: A Case of False Elimination*, 1980 ARIZ. ST. L.J. 217, 220-21 (1980).

<sup>6</sup>4 Ohio St. 3d at 55, 446 N.E.2d at 445. Lawrence Kersta is the pioneer of voice identification by means of voice spectrography. E. BLACK, *VOICEPRINTING* (1975).

<sup>7</sup>The spectrogram has a horizontal axis which indicates time lapse, and a vertical axis which indicates frequency. The thickness of the lines represents voice intensity. *State v. Williams*, 388 A.2d 500, 501 n.1 (Me. 1978). Mechanics of spectrography are discussed in A. MOENSSSENS, R. MOSES, & F. INBAU, *SCIENTIFIC EVIDENCE IN CRIMINAL CASES* 507-23 (1973).

<sup>8</sup>4 Ohio St. 3d at 55, 446 N.E.2d at 445. One court notes that the term "voiceprint" should be avoided as "potentially leading to an unwarranted association with fingerprint evidence." *United States v. Williams*, 583 F.2d 1194, 1197 n.5 (2d Cir. 1978).

with an unknown voice by pairing spectrograms of similar words and phrases from each voice to determine whether they were uttered by the same speaker.<sup>9</sup> Considering such variables as the comparative quality of the two tapes and the number of sample words, the operator then concludes that the taped voices are: 1) identical; 2) different; 3) probably identical; 4) probably different; or 5) impossible to identify.<sup>10</sup> In terms of courtroom testimony, the spectrograph operator is an expert witness.

In *Williams*, the perpetrator of an aggravated robbery and felonious assault forced his way into his victim's home by claiming that he had to call an ambulance. He made the call, requesting that an ambulance be sent to a false address, and then he beat and robbed his victim. An ambulance service recorded the call at the time of the assault. A few days later, the victim identified the defendant, Mose Williams, from a photo array. The police arranged for Williams to telephone the ambulance service and make the same statement as the intruder had made from the victim's home.<sup>11</sup> The ambulance service tape recorded this second call in the same manner as the first call.

The police sent the two tapes to Lt. Smrkovski, Commander of the Michigan State Police Voice Identification Division.<sup>12</sup> Smrkovski testified that the two voices were "one and the same."<sup>13</sup> In addition, the trial court admitted into evidence the tapes, the voice spectrograms prepared by Smrkovski, and testimony of another expert witness, who testified about the history and use of voice spectrography.<sup>14</sup> The jury convicted Williams, who appealed the admission of the voice identification evidence. The court of appeals affirmed.<sup>15</sup> The Ohio Supreme Court agreed, utilizing *Williams* as an opportunity to declare the standard under which Ohio courts should determine the admissibility of spectrographic voice identification and similar scientific evidence.

In reaching its decision the Ohio Supreme Court examined three analytic models for assessing admissibility of scientific evidence: a) the "general accep-

<sup>9</sup>"For an effective analysis, there must exist a sufficient number of words or phrases common to both tapes such that a valid comparison may be made." Gansiracusa, *supra* note 5, at 1166. Typical cue words which are selected for comparison are: "the," "to," "and," "me," "on," "is," "you," "I," "a," and "it." If whole words are not available for comparison, parts of words, vowels, or consonants common to both tapes are used. *Williams* 583 F.2d at 1197; Gansiracusa, *supra* note 5, at 1166.

<sup>10</sup>*Williams*, 583 F.2d at 1199.

<sup>11</sup>4 Ohio St. 3d at 54, 446 N.E.2d at 445. For a description of how calls are generally recorded, see Tosi, *supra* note 5, at 108-11.

<sup>12</sup>The Michigan department is well-known and long-established in forensic voice spectrograph. Lt. Smrkovski joined the Identification Unit of the Michigan Department of State Police in 1971. He was trained by Kersta (*supra* note 6) and received a Bachelor's Degree in Audiology and Speech Sciences in 1975, O. Tosi, *supra* note 5, at 140.

<sup>13</sup>4 Ohio St. 3d at 59, 446 N.E.2d at 448.

<sup>14</sup>This second expert was Dr. Henry Truby. Dr. Truby presented a paper on the application of voiceprint analysis to speaker individuation at the Second International Conference of Crime Countermeasures, Sciences and Engineering, Oxford, England, July 22-29, 1977. O. Tosi, *supra* note 5, at 176.

<sup>15</sup>4 Ohio St. 3d at 55, 446 N.E.2d at 445.

tance” standard;<sup>16</sup> b) the “reliability” standard;<sup>17</sup> and c) the McCormick standard as promulgated in the Rules of Evidence.<sup>18</sup> The court first considered the “general acceptance” standard set forth in *Frye v. United States*.<sup>19</sup> *Frye* requires a showing that the scientific method and principles at issue are “sufficiently established to have gained general acceptance in the particular field.”<sup>20</sup> The *Frye* test is difficult to employ because it necessitates a courtroom survey of “the subjective views of a number of scientists, assuring thereby a reserve of experts available to testify.”<sup>21</sup> For example, where spectrographic evidence is in issue, application of *Frye* encompasses a survey of experts in speech and hearing and related fields as well as those experts who actually work with the voice spectrograph.<sup>22</sup>

While this interpretation of *Frye*’s “general acceptance” language may be instructive for a new scientific method, a less exhaustive approach suffices where the method has gained some measure of credibility. Nearly eight years before the Ohio Supreme Courts decision in *Williams*, an Ohio Court of appeals held that the *Frye* standard did not preclude admissibility of voice spectrograms because of “the growing weight of authority [of other jurisdictions] finding no inhibition to the admission of recorded voice exemplars, . . . corroborated by expert witnessess.”<sup>23</sup> In *Williams* the Ohio Supreme Court expressly rejected the *Frye* analysis in application to spectrographic evidence,<sup>24</sup> noting Professor McCormick’s criticism of *Frye*:

“General scientific acceptance” is a proper condition for taking judicial notice of scientific facts, but not a criterion for the admissibility of scientific evidence. Any relevant conclusions which are supported by a qualified expert witness should be received unless there are other reasons for ex-

<sup>16</sup>4 Ohio St. 3d at 56-57, 446 N.E.2d at 446.

<sup>17</sup>*Id.* at 57, 446 N.E.2d at 447.

<sup>18</sup>*Id.*

<sup>19</sup>293 F. 1013 (D.C.Cir. 1923).

<sup>20</sup>*Id.* at 1014.

<sup>21</sup>*Williams*, 583 F.2d at 1198. Giansiracusa points out that a modification of *Frye* really serves as a separate standard of admissibility. This standard “is satisfied if the scientific technique is generally accepted by those scientists who would be expected to be familiar with its use,” thus excluding a survey of those speech and audiology experts who do not use the spectrograph. Giansiracusa, *supra* note 5, at 1177 (citing *People v. Williams*, 164 Cal. App. 2d 858, 331 P.2d 251 (1958))(bloodtest); and *Commonwealth v. Lykus*, 367 Mass. 191, 204, 327 N.E.2d 671, 678 (1975)(voice spectrography).

<sup>22</sup>*Reed v. State*, 283 Md. 374, 399, 391 A.2d 364, 377 (1978)(spectrographic evidence not admissible under *Frye*). See also Note, *Voice Identification Testimony Based On Spectrographic Analysis Inadmissible Because the Technique Has Not Gained General Acceptance in the Scientific Community — Reed v. State*, 39 MD. L. REV. 629 (1980).

<sup>23</sup>*State v. Olderman*, 44 Ohio App. 2d 130, 336 N.E.2d 442 (1975). The court relied principally upon *Commonwealth v. Lykus*, 367 Mass. 191, 327 N.E.2d 671 (1975), which held that spectrographic evidence met *Frye*’s general acceptance standard. However, see *supra* note 21.

The *Olderman* court also ruled that compelling a defendant to submit his voice to spectrographic analysis did not violate his Constitutional rights. The court stated that giving a voice sample for identification purposes was not testimonial in character, nor did a person have a reasonable expectation of privacy in the sound of his voice. 44 Ohio App. 2d at 134-36, 336 N.E.2d at 447.

clusion. Particularly, probative value may be overborne by the familiar dangers of prejudicing or misleading the jury, and undue consumption of time.<sup>25</sup>

Considering this accord with McCormick, it is not surprising that the court also declined the second analytic model, set forth in *United States v. Franks*.<sup>26</sup> *Franks* requires that the scientific process be "relevant and reliable" to be admissible. "Relevant and reliable" means that the proponent must establish that spectrographic analysis (or other scientific process) is sufficiently accurate to be meaningful in the forensic process. In *Franks* the expert voiceprint witness was qualified "only after an extensive 25-page inquiry into his qualifications and the reliability of the scientific process."<sup>27</sup> This "reliability standard" allows the trial judge wide discretion in evaluating the evidence without necessitating the broad scientific survey required by the *Frye* test. Nevertheless, the *Franks* approach does not differ very much from *Frye* as a practical matter. Under either approach the court is constrained to put the scientific process itself on trial before addressing how it relates to the specific case at hand. Finally, this type of "reliability" inquiry arguably goes to the weight of the evidence, as opposed to the sole question of relevance. Since weighing the evidence is the proper province of the jury, it is not a requisite function in determining admissibility.<sup>28</sup>

The court declined to adopt either the *Frye* or the *Franks* test because to do so would require a trial judge to extensively inquire into the scientific process involved in all cases. Instead, the court adopted a third, more flexible approach to spectrographic evidence. This approach is consonant with McCormick's viewpoint, and is to be applied on a case-by-case basis.<sup>29</sup> The court stated:

[W]e refuse to engage in scientific nose-counting for the purpose of deciding whether evidence based on newly ascertained or applied scientific principles is admissible. We believe the Rules of Evidence establish adequate preconditions for admissibility of expert testimony, and we leave to the discretion of this state's judiciary, on a case by case basis, to decide whether the questioned testimony is relevant and will assist the trier of fact to understand the evidence or to determine a fact in issue.<sup>30</sup>

The threshold inquiry under this standard is relevance. Evidence Rule 402 provides:

All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by the Constitution of the State of Ohio,

<sup>25</sup>(McCORMICK'S HANDBOOK OF THE LAW OF EVIDENCE § 203 (E. Cleary 2d ed. 1972).

<sup>26</sup>511 F.2d 25 (6th Cir.), cert. denied, 422 U.S. 1042 (1975).

<sup>27</sup>*Id.* at 33.

<sup>28</sup>See *Williams*, 388 A.2d at 505; *Franks*, 511 F.2d at 34.

<sup>29</sup>4 Ohio St. 3d at 57-58, 446 N.E.2d at 447. The court's holding parallels *Williams*, 388 A.2d 500 (Me. 1978).

<sup>30</sup>4 Ohio St. 3d at 58, 446 N.E.2d at 448.

by statute enacted by the General Assembly not in conflict with a rule of the Supreme Court of Ohio, by these rules, or by other rules prescribed by the Supreme Court of Ohio. Evidence which is not relevant is not admissible.<sup>31</sup>

Relevant expert testimony is admissible if it meets the standard in Evidence Rule 702, which provides:

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.<sup>32</sup>

Together, the two rules provide a basis for evaluating proffered spectrographic evidence. If the voice identification is relevant, and if the witness qualifies as an expert under Evidence Rule 702, and the identification will assist the trier of fact, then the evidence will be admissible. However, as McCormick points out,<sup>33</sup> the evidence could be excluded on other grounds, such as prejudice, misleading the jury, or other bases under Evidence Rule 403.<sup>34</sup>

Even when the evidence is admitted under the Rules of Evidence the jury is not bound by it, a further safeguard against "unreliable" evidence. According to the *Williams* court, the jury's control of the evidence, under proper jury instructions,<sup>35</sup> puts the controversy in its proper perspective:

We emphasize, however, that once the court determines admissibility, the jury remains at liberty to reject voice identification evidence for any number of reasons, including a view that spectrographic voice identification technique itself is either unreliable or misleading. We approve of the introduction, as here, of the original tapes used by Lt. Smrkovski, and the playing of the tapes for the jury, so they could hear for the voice(s) at issue.<sup>36</sup>

Based on this language, it is probably not enough for a voice spectrograph expert to testify as to his conclusions, accompanied by a verbal description of his technique. An offer of spectrographic evidence should include the tapes and spectrograms themselves. Nor does *Williams* suggest that the proponent of the evidence may omit proper evidentiary foundations. The witness must be properly qualified as an expert in voice spectrography. The opponent may introduce testimony which rebuts the reliability of the evidence by challenging the correctness of the scientific or forensic procedures used or the credibility of the spectrographer as an expert.<sup>37</sup>

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<sup>31</sup>OHIO R. EVID. 402.

<sup>32</sup>OHIO R. EVID. 702.

<sup>33</sup>See *supra* note 5 and accompanying text.

<sup>34</sup>OHIO R. EVID. 403.

<sup>35</sup>See 4 Ohio St. 3d at 59 n.7, 446 N.E.2d at 448 n.7 for the jury instructions used by the trial court.

<sup>36</sup>*Id.* at 59, 446 N.E.2d at 448.

<sup>37</sup>*Id.*

The court's bypass of the *Franks* reliability standard should not be confused with the indicia of reliability required to establish relevance. *Williams* does not say that the court should admit unreliable evidence. *Williams* does, however, remove the burden of a *Frye* or *Franks* type of requirement from the trial judge's inquiry. No rigid test beyond the evidence rules themselves need constrain the trial court's discretion as to admissibility. In applying its 402/702 standard to the evidence in *Williams*, the court said: "There was sufficient demonstration of 'reliability' adduced at trial to qualify the evidence as 'relevant' within the meaning of Evid. R. 402, and to qualify L.Smrkovski as an expert witness as provided in Evid. R. 702."<sup>38</sup> For scientific evidence to be relevant there must be "some demonstration that it is sufficiently reliable to make the existence or non-existence of a fact more probable than without the evidence."<sup>39</sup>

While clearly the test for voiceprints, the *Williams* standard of admissibility does not apply to polygraph evidence. In a footnote to *Williams*, the court declared that nothing in *Williams* "should be construed to weaken in any way the continued vitality"<sup>40</sup> of its holding in *State v. Souel*.<sup>41</sup> *Souel* carefully set forth the conditions for admissibility of polygraphic examination; it may be admitted for purposes of corroboration or impeachment, providing that certain specific conditions are observed.<sup>42</sup> In any case, polygraph evidence may be distinguished from the type of scientific evidence typified by spectrographic voice analysis. Use of the polygraph purports to establish the honesty or credibility of a person, a process which coincides squarely with the function of the jury. The conclusions of a polygraph expert may usurp the independence of the jury,<sup>43</sup> and are therefore dangerous on grounds not directly related to the reliability of the polygraph as a scientific method. By contrast, evidence such as the voiceprint, which relates only to identification, does not by itself "indicate with any degree of conclusiveness that the defendant. . . so identified. . . actually committed the crime."<sup>44</sup>

At the very least, the *Williams* standard should be applicable not only to spectrographic voice identification, but to other types of objective scientific methods which also aid in identification. Support for this proposition is found in *Owens v. Bell*,<sup>45</sup> in which the Ohio Supreme Court applied *Williams* to the admissibility of human leukocyte antigen (HLA) tests to establish the probability

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<sup>38</sup>*Id.*

<sup>39</sup>Note, *supra* Note 22 at 637; OHIO R. EVID. 401.

<sup>40</sup>4 Ohio St. 3d at 56 n.4, 446 N.E.2d at 446 n.4.

<sup>41</sup>53 Ohio St. 2d 123, 372 N.E.2d 1318 (1978).

<sup>42</sup>*Id.*

<sup>43</sup>Comment, *supra* note 5, at 227.

<sup>44</sup>United States v. Alexander, 526 F.2d 161, 169 (8th Cir. 1975).

<sup>45</sup>6 Ohio St. 3d 46, 451 N.E.2d 241 (1983).

of paternity. First finding that the HLA tests would not be contrary to statute,<sup>46</sup> the court then held the tests to be relevant and admissible under the Ohio Rules of Evidence as set forth in *Williams*.<sup>47</sup> Thus, by its own authority, the Ohio Supreme Court intends *Williams* to be applied to other objective scientific methods.

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<sup>46</sup>*Id.* at 51, 451 N.E.2d at 242. The statutes in question were OHIO REV. CODE ANN. §§ 3111.09, 3111.10, 3111.16 and 2317.47 (Page 1980) relating to the use of blood grouping tests in determining who is not the natural father of a child. HLA is not a blood grouping test, but is based upon tissue typing of the white blood cells. In this case the HLA test results indicated a 98.4 percent probability that the appellee was the father. *Id.* at 46, 451 N.E.2d at 241-42.

<sup>47</sup>*Quoted in* 451 N.E.2d at 245. The court quoted directly from *Williams*.



