D54 The Scientific and Legal Status of Forensic Speaker Recognition in the United States

James L. Wayman, PhD*, San Jose State University, Office of Graduate Studies and Research, MS 0025, San Jose, CA 95192-0025; William C. Thompson, PhD, JD, University of California, Dept of Criminology, Law & Society, Irvine, CA 92697; and Dorothy J. Glancy, JD, Santa Clara University, School of Law, 500 El Camino Real, Santa Clara, CA 95053

The goal of this presentation is to provide a tutorial on the current state of forensic speaker recognition with an update on Overseas Security Advisory Council (OSAC) activities in this area.

This presentation will impact the forensic science community by discussing ways to improve the introduction and acceptance of new technologies for speaker recognition in American courts.

The use of scientific techniques to identify the speaker in an audio recording has a long and mixed history in American courts. An early non-digital methodology from the 1940s, known as "visible speech," created spectrographic, pictorial representations of speaking patterns, which were compared by humans to determine if a graphical pattern from an unknown source could have come from a known speaker. Re-christened as "voiceprinting" in the early 1960s, testimony based on this graphical, spectral analysis method was admitted by a number of courts under the Frye standard, which requires that the method has attained "general acceptance in the particular field in which it belongs;" however, in subsequent decades, critiques of voiceprinting (including two influential reports by the National Academy of Sciences) caused the method to fall out of favor in the general scientific community, although cases admitting such evidence continued to be cited as legal precedent. Graphical spectral analysis (voiceprinting) has now been widely discarded in favor of two alternative approaches to speaker recognition, both with a lengthy scientific history: Automated (computer-based) Speaker Recognition (ASR) and human examiner-based aural perceptual (or "structured listening") techniques.

In *Daubert v. Merrell Dow Pharmaceuticals* (1993), the United States Supreme Court adopted a new standard for the admissibility of scientific evidence in federal courts — a standard that requires the trial judge to assess the scientific basis of the testimony. In its discussion of factors judges should consider, the Court referred to two cases involving expert testimony based on voiceprints — *United States v. Williams* (*CA2 1978*) (concerning the importance of standards regarding the implementation of a scientific technique) and *United States v. Smith* (*CA7 1989*) (on the relevance of the known or potential rate of error of a particular scientific methodology). The Court's reference to voiceprint testimony as exemplars of desirable features of scientific evidence is ironic, given that voiceprints, even when generated by digital technology, are no longer generally accepted by the relevant scientific community.

In the high-profile 2013 case of *State of Florida v. George Zimmerman*, the trial court referenced the accepted but outdated precedent on the admissibility of graphical spectral analysis (voiceprints) in denying admittance of highly problematic expert testimony based on automated speaker recognition, stating 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," but that automated speaker recognition proffered is "not as widely accepted at this time." This case well illustrates the difficulties that arise when evidence from evolving scientific fields like speaker recognition enters the legal system.

This presentation will review the technical basis and legal status of these three techniques for speaker recognition: (1) graphical spectral analysis (voiceprints); (2) automated (computer-based) speaker recognition (ASR); and; (3) human examiner-based aural perceptual (or "structured listening") techniques. An important continuing speaker recognition test program conducted by the National Institute of Standards and Technology (NIST) and the activities of the Scientific Working Group for Forensic and Investigatory Speaker Recognition, created in 2012 with a broad agenda to support scientific, technical, and legal advancements, including an acknowledgement of privacy concerns will be discussed. (In late 2014, that group was reorganized as a sub-committee under the new Organization of Scientific Area Committees (OSAC) structure). This presentation will conclude with a broad discussion of ways to improve the introduction and acceptance of new technologies for speaker recognition in American courts that avoid muddling 21st-century scientific methodologies for speaker recognition with the now-discredited field of voiceprinting.

Speaker Recognition, OSAC, Florida vs. Zimmerman

* Presenting Author