

## International Association of Forensic Linguists

The International Association of Forensic Linguists held its Biennial Conference at the University of New England (UNE) in Armidale, NSW in July. As part of this conference, a forum was organised to discuss issues in speaker identification.

The forum was chaired by Dr Helen Fraser, lecturer, Department of Linguistics, UNE. There were four invited speakers: three phoneticians — Professor Andy Butcher of Flinders University, Dr John Ingram of the University of Queensland and Dr Phil Rose of the Australian National University — and a private investigator with experience in using phonetic evidence in court, John Bracy. Delegates to the conference formed the audience and participated in the discussion.

Speaker identification is the branch of phonetics which investigates how to reliably identify a voice belonging to a particular speaker. Naturally it would be of great value in many legal cases if it could be established beyond reasonable doubt that a taped voice is that of a particular suspect — just as it is of great value to have fingerprints which establish that a particular person touched a particular object at some time.

Phoneticians at the forum, however, were doubtful that the state of knowledge of speaker identification within phonetic science is sufficiently advanced to allow this kind of statement and expressed concern that there are some scholars willing to offer claims of positive identification to courts.

The discipline of phonetics has been concerned for most of its history to specify characteristics which identify particular speech sounds, rather than particular speakers. The characteristics of sounds that are best understood by the discipline, therefore, are those which remain constant across many speakers — and thus allow inter-personal communication—rather than those which are unique to a particular person.

Many experiments have shown that human auditory recognition of voices, though it seems very reliable to everyday experience, is quite fallible when presented with an open set of voices, with very similar voices, or with disguised or distorted voices.

## Phonetics — what the expert witnesses can (and can't) say about speaker identification

It seems necessary to take a different approach, looking at the acoustic structure of voices.

Phoneticians have been investigating which acoustic characteristics of voices best specify individual speakers, but the state of knowledge on this topic is still severely limited. Several acoustic features have been found which can be used fairly successfully to identify a speaker from a small set, but in all cases enormous drops in performance occur when the set of possible speakers is increased or when voices are disguised or recorded under different conditions.

Thus we do have some knowledge of the acoustic characteristics that vary across speakers, but we have little knowledge of the statistical distribution of these characteristics across the population at large. Nor can we say with certainty which characteristics are resistant to disguise or mimicry, or which best survive distortion by telephone transmission or different recording conditions. Since there is a large commercial market waiting for a system which could make positive identifications by voice (eg for banking applications), the fact that available technology is not being exploited by commercial enterprises is a good indication that the state of the art is not yet good enough for accurate speaker identification.

In short, phoneticians at the conference were unanimous that speaker identification statements should be used with extreme caution, especially in courtroom situations. There was discussion of the term "voiceprint" as a popular term for spectogram (a visual representation of speech commonly used in phonetics laboratories). This term was felt to suggest a parallel with "fingerprint" that is totally unwarranted. A better analogy is with an "Identikit" image, giving clues to a person's identity. Another useful comparison is that a spectogram is like a footprint, which can give useful information about a person's size, weight, stance and so on, but is very far from allowing positive identification of the walker.

Most discussion at the forum was directed towards the need to communicate these professional opinions outside the discipline of phonetics. Concern was expressed that there are phoneticians willing to present evidence in court that they can positively identify a taped voice and attach a percentage probability of accuracy to their statement, despite the opinion of a large cross section of professional phoneticians that this practice is misleading.

It was felt that pressure from courts for this type of statement had created two categories of phonetician: the "dries" who are willing to make positive identifications and the "wets" who are unwilling to do so. Members of the forum urged legal professionals to disseminate information about the current status of phonetic science with regard to speaker identification, but some doubt remained as to how effective this would be. It seemed likely that media interest in "voiceprints" and machine identification along with interest from, particularly, prosecution teams in securing positive identification would override the more cautious voices of the profession.

There are three bodies who might be able to register phoneticians to make authoritative statements in court — the International Association of Forensic Linguists (IAFL), the International Association for Forensic Phonetics (IAFP) and the Australian Speech Science and Technology Association (ASSTA) but the existence of such a register would only be effective if courts were willing to require that phonetic evidence be given only by registered experts.

It was emphasised at the forum that there is a role for phonetic expert evidence in court and there is a great deal that phoneticians can say about voices that would not be apparent to untrained people. It is likely that over the next decade or two, significant advances will be made in the field of forensic speaker identification.

What is important is that an accurate picture be available to the community of the current limits of this type of evidence. A working party has recently been formed by ASSTA to prepare a statement of current practice in the area and recommendations for use of this type of expert evidence in legal cases.

The need for good communication between the legal and linguistic professions was a theme of the whole conference, and no less so of this forum on speaker identification.

– Helen Fraser