Forensic Speaker Comparison Evidence:  
The International Picture  

Erica Gold  
Department of Language and Linguistic Science, The University of York, UK  
erica.gold@york.ac.uk

Introduction
Internationally, there is an extremely wide range of variation in respect of what goes before the courts as forensic speaker comparison evidence. Until recently, the nature and extent of this variation has not been documented. This research contributes to the IAFPA special session on Presenting Evidence in Court by outlining the results of the authors’ international survey of methods, foci and conclusion frameworks in use by forensic speech scientists across the world.

Participants
Potential participants were contacted through their professional and research organizations and invited to take part in an online survey. 36 responses were collected. Respondents, who were given the freedom to answer all or some of the questions, were drawn from the following 13 countries: Australia, Austria, Brazil, China, Germany, Italy, the Netherlands, South Korea, Spain, Sweden, Turkey, UK, and USA.

Methods of Analysis
There is at present no consensus of opinion in the scientific community as to how FSC analysis should be carried out. Rather, a wide range of methods is employed. Methods are grouped under the following headings: Auditory Phonetic Analysis Only (AuPA), Acoustic Phonetic Analysis Only (AcPA), Auditory Phonetic cum Acoustic Phonetic Analysis (AuPA+AcPA), Analysis by Automatic Speaker Recognition System (ASR), and Analysis by Automatic Speaker Recognition System with Human Analysis (HASR). The specific features of speech that are analyzed and considered important vary from analyst to analyst within each of the method categories.

Features Examined
“The whole is greater than the sum of the parts (Aristotle)”

In addition to being asked about features within linguistic, phonetic and acoustic domains, participants were given the opportunity to identify which feature from any domain they found most useful. Voice quality was reported most often (32%), followed by dialect/accent variants and vowel formants (both 28%). 20% reported speaking tempo and F0 as useful parameters. This was followed by rhythm (16%). Lexical and grammatical choices, vowel and consonant realizations, phonological processes (e.g. connected speech processes) and fluency were all reported by 13% of the respondents. And one respondent went as far as stating that vowel formant analysis “is rarely insightful.”

Interestingly, though perhaps not surprisingly, the vast majority of participants alluded to the fact that despite some individual parameters holding significant weight, it is the overall combination of features that they consider crucial in discriminating between speakers.
Conclusion Frameworks

As with method of analysis, there is no consensus as to how conclusions are and should be expressed. Currently, there is much debate in the field on the ‘logical’ and ‘legally correct’ frameworks for conclusions (French and Harrison 2007, French et al. 2010, Jessen 2008, Morrison 2009, Rose and Morrison 2009). A variety of frameworks for expressing conclusions are currently utilized across the world. The most commonly used conclusion frameworks by experts in descending order are: Classical Probability Scale (40%), the UK Position Statement (31%), Numerical Likelihood Ratio (11%), Verbal Likelihood Ratio (9%) and Binary Decision (6%).

Discussion

Those not directly involved in this specialist field but working in related areas, e.g., phoneticians with non-forensic interests and forensic scientists from other disciplines, may well be surprised at the lack of consensus over such fundamental matters as how speech samples are to be analyzed and compared, which aspects of the samples are to be assigned greatest importance during the analytic process, and how conclusions are to be expressed at the end of it. Indeed, it will be apparent that there was hardly a single issue explored in the survey with which anything approaching a consensus of practice or opinion was found. Whilst other areas of forensic science would undoubtedly show some degree of variation across individual practitioners, the wide disparities reported here must surely call for greater consultation, debate, and co-operation across experts, institutions and nations.

References


