

FORENSIC LINGUISTICS: FORMS AND PROCESSES

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Abstract

Following a brief introduction to the notion of forensic science and analysis, this paper will explain the different ways in which linguistics has contributed to police investigations and civil law. The paper will cover linguistic identification using spoken data and written data, and will discuss the use of discourse analysis as well as the more traditional phonetic and syntactic analysis for forensic examinations. Other applications that will be discussed include analysis for language of origin in refugee status claims, commercial applications and trademark disputes, and lie detection. Each of these applications will be considered critically and in relation to both the validity of the theories underlying them, and the statistical reliability of the analysis used to attain results.

Keywords: *Forensic linguistics; police investigations; credibility assessment*

Abstrak

Menyusul pengenalan singkat pengertian ilmu dan analisis forensik, makalah ini akan menjelaskan bagaimana ilmu linguistik telah memberikan kontribusi terhadap penyelidikan polisi dan hukum perdata. Makalah ini akan mencakup identifikasi linguistik menggunakan data lisan dan data tertulis, dan akan membahas penggunaan analisis wacana serta analisis fonetik dan sintaksis yang lebih tradisional untuk pemeriksaan forensik. Aplikasi lain yang akan dibahas meliputi analisis untuk bahasa asal gugatan status pengungsi, aplikasi komersial dan sengketa merek dagang, dan deteksi kebohongan. Masing-masing aplikasi akan dipertimbangkan secara kritis dan dalam kaitannya dengan kedua validitas teori-teori yang mendasari mereka, dan keandalan statistik analisis yang digunakan untuk mencapai hasil.

Kata kunci: *Linguistik Forensik; penyelidikan polisi; penilaian kredibilitas*

INTRODUCTION

When most people hear the term ‘forensics’ they immediately think of boffins in white coats performing almost magical scientific tests to provide that crucial piece of rock-solid evidence that solves a complex crime. On the rare occasion that a language expert is featured in one of the many television crime dramas, the expert is invariably able to rely on some kind of supercomputer to identify suspects by their ‘voiceprint’, irrespective of the quality or quantity of data available. Sadly, such an image is strictly limited to the realm of science fiction at this stage, as no-one has yet been able to isolate a uniquely distinguishing feature of the human voice upon which to base such a ‘voiceprint’. Nonetheless, the student of linguistics, excited by the possibilities of such a real-world application of their skills in analysing language, should not be put off by this gap between myth and reality: the truth is that forensic linguistics is a more varied and fascinating field than could ever be imagined by a lay audience. Forensic linguistics, and the study of language and the law more broadly, requires the analyst to enlist a wide variety of analytic tools and skills, drawing on almost every aspect of core linguistic study, from phonetics to pragmatics, from syntax to sociolinguistics. Forensic linguistic enquiries may form part of criminal investigations by police, or they may be initiated by the defence team on behalf of a client. They may involve trademark disputes or even non-legal concerns, such as selecting the most appropriate brand name for a product to be launched in a specific market.

The International Association of Forensic Linguists and the International Association for Forensic Phonetics and Acoustics were formed in the early 1990s by specialists working in these areas and, while each organisation represents a different emphasis in the field, they are both represented by the scholarly publication, the International Journal of Speech, Language and the Law.

The aim and purpose of International Association of Forensic Linguists, from the website www.iafl.org: 'The purpose of the Association is to improve the administration of the legal systems throughout the world by means of a better understanding of the interaction between language and the law.'

AN EARLY EXAMPLE OF FORENSIC LINGUISTIC ANALYSIS

The following case study will give some indication of the breadth of scholarship needed by the forensic linguist in providing expert evidence.

In 1950, Timothy John Evans was hanged for the murders of his wife and child at 10 Rillington Place, London. Evans had maintained his innocence, and accused John Reginald Halliday Christie of committing the crimes, despite the fact that the police were able to produce an allegedly verbatim record of Evans confessing to the murders in his police interview. In a dramatic turn of events, Swedish linguist Jan Svartvik showed, in 1968, that the confession used to convict Evans was most likely the product of police influence and differed sharply in style and structure from the remainder of Evans's statements. Svartvik 1968 was able to show, using linguistic analysis of the discourse structures, that the key sections of the statement, where Evans apparently confesses to the murders, are written using a formal register, typical of police texts, but most atypical of the speech of Evans and inconsistent with the remainder of the interview transcript. Evans was posthumously pardoned and, when several more bodies were discovered at 10 Rillington Place, Christie was hanged.

Svartvik's analysis of the Evans case, often cited as the original forensic linguistic investigation, involved the analysis of syntactic structure, style, register, spoken language versus written language, and knowledge of the specific police register used in statement taking. It is interesting that this landmark case did not involve the analysis of vocal qualities, which has now become the archetypal forensic linguistic application.

HERE ARE SOME TYPES OF FORENSIC ANALYSIS

Identification

The types of analysis that are most commonly associated with the practice of forensic linguistics are those that seek to identify the source of a message. This includes the analysis of spoken and written data, and can involve some level of computer or statistical analysis. The data being used in the analysis will almost always include at least one sample of 'known data', where the source has been reliably identified, and one sample of 'questioned data', where the source is unknown. There may be some rare cases where two data samples are compared to establish whether or not they originate from the same source, without either being identified as belonging to a specific speaker. A 'scoresheet' may be devised, where each segment from the questioned data is rated against the known data for similarity.

Spoken Data

There is some debate as to whether identifying the source of spoken data should be labeled ‘voice identification’ or ‘speaker identification’, but either way, the process for this kind of analysis involves comparing samples of recorded voice data in order to establish the likelihood that they represent samples of the same voice, versus the likelihood that they represent samples of different voices. Individual sounds as well as longer stretches of talk are usually isolated for comparison across the samples. Nowadays, this is done using some form of digital sound editing software that allows the analyst to isolate very small amounts of speech data, such as one vowel sound, into separate files or segments. In this way, the analyst can collect many tokens of specific sounds or utterances which represent different aspects of the voice(s). So for example, the analyst may choose to isolate all the instances of close front unrounded vowels (the vowel in *seen*), and compare them across the samples using either an automated or machine-assisted process or by listening with an ‘expert ear’. This process would then be repeated for a range of individual phonemes, as well as for longer stretches of talk.

The approach that is commonly known as forensic phonetics involves the automated or semi-automated processing of vocal data segments according to measurable features, such as formant values (see the box below), pitch range or the rate of speech. This computer-based analysis may be supported by the expert phonetician’s perception of the vocal features in each sample.

During speech production, the air in the vocal tract vibrates at many different frequencies at once and in the production of vowel sounds, the most dominant frequencies combine and appear as bands on a spectrograph image of the air vibrations. Each of these bands is known as a formant and the different vowels are typically characterised by the different combinations of the first three formants (i.e. the three bands appearing at the lowest frequencies).

When the analysis relies solely on the expert’s ‘ear’ to determine the phonetic qualities of the samples, the term used by some forensic linguists is ‘aural-perceptual analysis’ (Hollien 2002). The analyst considers the data in terms of various vocal parameters, such as perceived pitch, articulation and prosody, which can be heard and compared across samples.

The aural-perceptual analysis in particular may also rely on the analyst’s knowledge of dialectology and sociolinguistics to compare the data samples. In this kind of analysis it is the presence of certain dialectal features that enables the analyst to distinguish the two speakers.

For the analysis of spoken data in legal cases, the known data samples are very often drawn from a recording of the police interview with the suspect. The unknown data samples are usually some form of covert recording obtained by tapping the suspect’s phone, or from a concealed recording device, but in one case well known to the author, the questioned audio data samples were extracted from a video surveillance tape (CCTV) made during armed robberies allegedly committed by the suspect. While the video footage was of such poor quality that the person committing the crimes could not be identified visually, the audio tracks were of high quality and provided critical evidence in the case.

Written Data

The principles of the forensic examination of written data are essentially the same as for spoken data – that is, samples of known and questioned data are compared according to a set of linguistic parameters. In the case of written texts, the sorts of features that can be systematically analysed include punctuation, sentence structure, verb types, terms of address, spelling and grammatical errors, any idiosyncrasies of the writer, and broader patterns of discourse, such as the development of specific themes.

One of the problems facing prosecutors in legal cases that involve written data is how to obtain known data samples from the suspect. Very often, the questioned material, such as a threatening letter or ransom note, is readily available as it forms the basis for the complaint against the suspect. The known text, where available, often has to be drawn from personal communications signed or otherwise identified as written by the suspect. Email is becoming a major source of this kind of data, but it is important that the impact of the medium of communication is taken into account when comparing email with, say, a handwritten letter.

The method of analysis might also present problems for a court. In the case described below, the court was unable to accept the results of a statistical analysis of punctuation data but instead decided to rely entirely on the qualitative analysis of specific features. This highlights the differences between courtroom rules of evidence and academic standards of validity. This issue is discussed further in the Summary of Key Issues below.

Case study:

A murder trial in which I gave evidence in the Bendigo Supreme Court (Victoria, Australia) involved the analysis of four anonymous letters that contained threats against both the deceased and the accused. The letters were produced as evidence of the accused man's innocence by the defence, but were deemed suspicious by the prosecution, as explained below.

The case revolved around the death by arson of a middle-aged woman living in a rural part of Australia with her husband. The couple had not been living in the area very long, and had apparently been subject to a campaign of bullying or at least social rejection and threats from the local community, and might have had some specific enemies in the town. A short time after they had arrived in the town, the wife died in suspicious circumstances as a result of a fire at the couple's property. During the police investigation into her death, the husband was arrested and charged with her murder, but he subsequently pleaded not guilty in court.

In his defence, the husband produced four short letters printed together on a single sheet of paper. He claimed that he had copied the letters from their original source although it was unclear in the trial whether this was an email source or hard copy letters. In any event, the evidence consisted of a series of four letters that were alleged to have been written to the couple by a third party or group of people who were apparently vehemently opposed to the couple residing in their community. The defence had presented these letters as evidence that there was an existing threat against the wife and it was these other people that had carried out attack that ended the life of the victim. When other evidence was gathered that suggested the husband was the perpetrator, such as crime scene evidence related to the fire, the police decided that the letters should be verified for their authorship.

At the time of my analysis I was unaware of the context surrounding the evidence. I was only provided with a copy of the four letters and a collection of emails sent by the husband to his wife immediately prior to her death. These emails were used in the analysis as the 'known data', since their authorship was not in dispute.

Despite my lack of knowledge about the case, I believe I did make some suppositions, unconsciously, about the data. For instance, I recall that I had an expectation that all the threatening letters would have been produced by the same author – either the suspect or some unidentified party. In other words, although I compared each letter to the known data set individually, I expected to find that

either all the letters would match the known data set or none of them would match the known data set. It was therefore an unexpected outcome that three of the letters did have a strong match with the known data set, but one letter, the first letter on the page, had a very weak match, or a negative match, with the known data set.

The analysis of data that I carried out consisted of two main phases: the first was an analysis of syntactically classified punctuation as described in Chaski (2001). In this paper, Chaski demonstrates how punctuation marks that are quantified and classified according to their syntactic function can be used reliably to differentiate between authors of a number of written (English language) texts.

The second phase was a comparative stylistic analysis of specific words and phrases used across the two sets of texts. There were a number of rather idiosyncratic spelling and grammatical choices that appeared in the known data set and the three later letters, but not in the first letter. While punctuation was analysed in the first phase for its syntactic function, in the second phase I noted some patterns of punctuation that appeared in the three later letters and the emails but not the first letter. The pattern of first person pronouns (“I” and “we”) that were used in the letters also changed between the first letter and the later three letters. Finally, I examined the use of taboo language (terms of abuse) and I found that there was a clear shift between the first letter and the later three letters in the type and strength of the abusive language that appeared. English swear words are highly sensitive to hierarchical ordering: that is, English speakers easily able to distinguish between swear words according to their level of social taboo and there are clear examples in everyday usage of certain words being banned under certain circumstances, most obviously in the media. Therefore, when a writer uses some moderate swear words but not other more offensive words, they are making a conscious choice to restrict the level of taboo language. In the evidence for this case, the first letter contained emphatic but only moderately offensive swear words. This contrasted strongly with the remaining three letters where the swear words and taboo phrases used were of the most highly offensive categories, for instance, words that are almost always banned in public television broadcasts even for an adult audience.

As is typical in forensic casework, it was about two years before I was called to give evidence in court. At the Supreme Court trial in Bendigo it became clear that the case for the prosecution was consistent with my findings. Although the couple had received one threatening letter from anonymous community members, and may have received verbal threats as well, the accused was believed to have written the other three letters to exaggerate the threat and present the author/s of the original letter as the murderers. My evidence was considered along with other forensic evidence such as chemical analyses of the burnt materials in the room where the wife perished to aid the identification of the accelerants used in the fire.

My evidence was presented over two days, most of which was taken up by the defense in cross examination. Naturally, a great deal was made of the differences identified between the first letter and the other three, and the defense case rested mainly on the assertion that just as authors can change their style of writing over the course of their career, an individual might change the way that they write a series of threatening letters.

It is difficult to refute an assertion like this when being cross-examined in the adversarial court system, because you are confined to answering questions. The

counsel for the defense began by asking me if I'd read several works by Hemingway, or EM Forster or Evelyn Waugh. There ensued a rather ugly attempt to smear my professional standing on the basis that I had not read much of these early twentieth century writers. I suggested Mervyn Peake, but Peake's books were unknown to the defense counsel, and at that point the judge interrupted this farcical cross-examination to insist that the defense counsel get to the point. Counsel then tried to have me agree to the assertion that although authors have a distinctive style, this can change over time, just like a letter writer. I refused to agree with this assertion, and forced Counsel to request that I explain my refusal. This gave me the opportunity to point out that the work of famous authors is not at all like the production of letters used in forensic linguistic analysis most obviously because, unlike famous authors, threatening letter writers do not have their work modified by an editor. Astonishingly, the counsel for the defense tried to claim that truly great authors never have their work modified by editors, but even the jury laughed at this claim. It was difficult to ignore the sarcasm and derision used by the defense counsel to emphasize his claims, but at such times it is always necessary to focus on the content and validity of the claims, and not the emotional impact of their delivery.

As the cross-examination continued, I was able to explain that the analysis of syntactically classified punctuation (Chaski 2001) that I had undertaken is not just a matter of style, but can distinguish between authors on statistical grounds. The jury were quite interested in my evidence, perhaps because it was easier to understand than chemical analysis and burn marks. The two types of evidence that I gave seemed to be reasonably well understood, and although the comparative stylistic analysis was clearly more accessible to the jury than the statistical analysis of punctuation, like most researchers, I felt the quantitative punctuation analysis was more reliable.

The judge, however, eventually made a decision that the evidence relating to the Chaski method of analysis could not be admitted, because Chaski's article had only been published three or four years before I had used it in my analysis. In a courtroom, this is not considered long enough for a published method to be properly tested and accepted as reliable.

This illustrates an important feature of courts, at least in an adversarial system: the main test of whether a particular kind of evidence can be admitted as part of a case is precedence. If evidence of this kind has been admitted by a judge in a higher court, or an equivalent court in another country, then it is deemed acceptable. What this means, however, is that whenever a completely new kind of expert evidence is presented to the court, the judge faces a great deal of pressure in deciding whether or not to allow the novel procedure or expert evidence. If the evidence is allowed, then it sets a legal precedent, and all other lower or equivalent courts can accept this evidence too. In the Supreme Court, the judge's decision to allow a new type of evidence will flow on to most other courts in the country (Supreme, County and Magistrates for example). Thus, it should not have been surprising that the Bendigo Supreme Court judge was rather cautious about allowing what he saw as a novel form of analysis, namely Chaski's syntactically classified punctuation, even though from a scientific perspective, his reservations were ill-founded.

Over the last ten years, cases have been undertaken by forensic linguists that involved mobile phone text messages, and the distinctively individual nature of text messages is considered an advantage in author identification. For instance, handwriting and typeface comparison are not considered part of forensic linguistic practice, but are often carried out by the relevant experts in conjunction with the forensic linguistic analysis.

Discourse Analysis

The area of forensic discourse analysis is concerned with the appropriateness of interviewing techniques, the interpretation of legal texts, suspect profiling and other applications of discourse analysis to a legal case or to law enforcement more broadly.

An interpretation of a legal text for a Bankruptcy case in heard in the Federal Court of Australia is described below.

The expert testimony reads: The semantic interpretation of the adjectival phrase *standing to the credit of* rests in the aspect of the verb form *standing*. It is possible to expand the elliptical form of the phrase from *the moneys standing to the credit of* to the full, implied form *the moneys [that are] standing to the credit of*. The structure of *standing* is thus TO BE + stand + ING. This form is the present progressive and is described by Kreidler 1998 as a temporary or bounded form. Kreidler further notes that: ‘the present progressive is used for what is temporarily true’. Thus, the activity *standing to the credit of* is confined to a bounded period of time – it does not extend indefinitely as might be the case with the simple present *stands to the credit of*, which would express a durative activity, something that may continue to be true. Conclusion. According to the semantic analysis of the questioned text, the phrase *the moneys standing to the credit of* is highly likely to be interpreted by the addressee to mean that the moneys are those standing to the credit of the relevant accounts at the time that the words were written – that is, the date of the Order or, at the latest, the date of the Order being read by the addressee.

In this case, an Order was made by a judge prohibiting the defendant from accessing money held in various bank accounts. The forensic linguistic analysis focused on a phrase used in the Order where it described the relevant funds as ‘moneys standing to the credit of [bank accounts held by the defendant and his associates]’ and considered whether or not the paragraph would be reasonably interpreted to mean that the word ‘moneys’ referred only to funds in the relevant accounts at the time that the Order was made, and not to any future funds credited to the accounts.

Language of Origin

Linguists may be called on to identify a speaker’s national or regional origin. This is done by analyzing features of their language such as accent, vocabulary and grammatical features. Clearly, this type of analysis has applications in establishing refugee status, where it is commonly used, but as it requires the analyst to have a thorough knowledge of both language acquisition theory and the very specific regional dialect spoken by the subject, its legitimacy is strongly contested by organizations such as the International Association of Forensic Linguists.

Commercial Applications

There are many commercial applications of forensic linguistics, but the most common applications are in disputes over trademarks and copyright. Very often a company will require expert testimony as to the extent to which a rival company may have infringed copyright or trademark legislation in naming or promoting a new product.

A case study is provided below, but names and geographic references have been changed to protect the commercial interests of the clients.

Company A was introducing a new Scotch Whiskey onto the market, and had chosen the name Hoch Ay: a purely made-up name that was perhaps intended to reflect the Scottish origins of the drink. However, another company, Company B, already had a brand of Scotch Whiskey called Hawk Eye. Company B was suing Company A for copyright infringement on the basis that if the name of the product made by Company A (Hoch Ay) were to be pronounced with a Scottish accent, it would sound identical to the name of the product made by Company B (Hawk Eye). In a crowded bar or nightclub, where the drink would be sold, Company B claimed that this would cause unacceptable brand confusion.

A forensic linguistic analysis was required to show whether a) the brand name Hoch Ay would indeed sound like Hawk Eye if it were pronounced with a Scottish accent and b) the target market of young Australian adults would adopt a Scottish accent to pronounce the brand name Hoch Ay.

The analysis cannot be discussed in any detail because the actual case did not involve a Scottish accent, or even an English language accent. However it may be useful to make some general observations about the case, because it involves variational sociolinguistics, rather than phonetics, syntax or semantics.

Part a) was a straightforward analysis of the made up words of the new brand name according to the rules of a foreign pronunciation. Part b) was a more difficult sociolinguistic analysis, because it involved research into the socio-economic status of the target market, and then a calculation of the likelihood of this group using a foreign accent to pronounce a made up, but potentially foreign, brand name.

At the time of writing this case has not gone to trial, but it may yet come before the courts at which time the results can be published in full.

Lie Detection

Various forms of linguistic analysis are employed by those attempting to establish the veracity of written, and sometimes spoken, statements. Often the analysis includes consideration of personal pronouns, tense, vocabulary items and sentence structure, but does not usually take account of socio-cultural and regional variation in language use. This type of analysis is only loosely classed as forensic linguistics as its validity is often the focus of disagreement among professionals and academics working in the area.

It is important to emphasize that commercial methods of lie detection involving the analysis of written texts, such as Scientific Content Analysis and Criteria Based Content Analysis, have not been verified by laboratory testing. A great deal of psychological research has been conducted into verbal cues to deception (see Vrij 2008 for a comprehensive introduction), but far less attention has been paid to the linguistic methods purportedly used in for example Scientific Content Analysis (but see Heydon 2008). Identifying reliable of deception in written texts is therefore a critical area of research for scholars wishing to make a valuable contribution to forensic linguistics.

SUMMARY OF KEY ISSUES

A major concern for members of the international forensic linguistics community is the reliability of the evidence obtained through forensic linguistic analysis. There continues to be much controversy surrounding almost every aspect of forensic linguistics described in this paper, primarily due to questions of methodology and expertise. In many instances, the debate

focuses on whether the analytic technique is statistically valid, though in some cases, such as lie detection and language of origin analysis, the main concern is that the methods are not based on sound sociolinguistic and/or language acquisition theory in the first place, but are used uncritically by government departments and law enforcement agencies. In such cases, many linguists have considered it their professional duty to inform and educate such agencies about the pitfalls of using unreliable analytic techniques.

The controversy over the statistical reliability of analytic methods, especially in the area of voice or authorship identification, is generating intense debate within the forensic linguistic community. There is a clear division between those who reject all analysis that cannot be statistically validated, and those who argue that there is a place for qualitative analysis, such as dialectology and sociolinguistic analysis, in expert testimony.

In cases relating to the analysis of discourse structure, and especially where the dispute centres on the interpretation of a legal text (see the case study above) it is common for the linguistic evidence to be disregarded on the basis that such interpretation is a matter for legal experts, not linguists. In the case presented above concerning the semantic interpretation of the verb *standing*, the judge ruled that the matter was a point of law and therefore not the province of a linguist, irrespective of their expertise.

The question of whether linguistic expertise will be recognized by courts, or whether linguistic evidence will be allowed by judges or magistrates, is further complicated by the reliance on precedence as a method for selecting evidence for inclusion. As discussed earlier, judges and magistrates are wary of allowing new kinds of evidence or expertise into their courts and thus setting a legal precedent. As members of an international community, forensic linguists have a role to play in furthering the reach of our expertise. The publication of the *International Journal of Speech, Language and the Law* is part of this process of improving our profile and chances of recognition as experts. However there is more that can be done by linguistic associations, such as KIMLI, simply by raising awareness of linguistics as a science. All too often, legal practitioners report that they would never think to consult a linguist about matters of language, because they believe that all their experience in writing legal cases and appearing in court makes them experts in language by default. They, like many members of the general public, are blissfully unaware of the discipline of linguistics as the scientific study of language as a system. In the bankruptcy case described above, the judge simply refused to accept that there was such a field as 'linguistics', which makes you wonder what we all do for a living!

NOTE

* I would like to thank an anonymous reviewer for very helpful comments on the earlier draft.

FURTHER READING

The International Journal of Speech Language and the Law is published by Equinox. ISSN (print) 1748-8885, ISSN (online) 1748-8893

See also Coulthard 1997; 2000; Danet 1980; Gibbons 1994; Hall and Collins 1980; Hammarström 1987; Jensen 1995; Kaplan, Green, Cunningham et al. 1995; Shuy 1993; Solan 1998.

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