LINGUISTIC EVIDENCE IN COURT: CURRENT ISSUES, CURRENT TRENDS

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Forensic Sciences Under Attack:
2009 National Research Council Report

A body of research is required to establish the limits and measures of performances and to address the impact of sources of variability and potential bias. Such research is sorely needed, but it seems to be lacking in most of the forensic disciplines that rely on subjective assessments of matching characteristics. These discimplines need to develop rigorous protocols to guide these subjective interpretations and pursue equally rigorous research and evaluation programs.

Attacked and/or Discredited

Bullet Lead Analysis

Forensic Dentistry

Handwriting Analysis

Toolmark Analysis

Others

What are the Problems?

- ▫ Conflict of Interest

- ▫ Cognitive Biases

The *Daubert* Standard in the US

(1) whether the theory or technique in question can be and has been tested;

(2) whether it has been subjected to peer review and publication;

(3) its known or potential error rate;

(4) the existence and maintenance of standards controlling its operation; and

(5) whether it has attracted widespread acceptance within a relevant scientific community.

Kumho Tire v. Carmichael (1999)

- A tire exploded causing injury. Should a tire expert, who examined the tire, be permitted to opine that the cause of the blow out was the quality of the tire, and not its age or the driving conditions?

- The court held that the standard is whether his method could reliably determine the cause of failure of *the particular tire at issue.*

This suggests that the selection of training sets, validation procedure, etc. will be subject to scrutiny.

The law overvalues precise measurement in science and disrespects uncertainty. Nonetheless, these standards respond to real problems.

Conflicts of Interest

If I please the party that brought me into the case, there will be more work for me.

Cognitive Biases

1. Confirmation Bias

2. Base Rate Neglect

3. The Bias Blind Spot

From Darley and Gross

This girl, from a low socio-economic background, is taking a standardized test. Comment on how she is doing.

This girl, from a high socio-economic background, is taking a standardized test. Comment on how she is doing.

Wason Card Test:
Cards have a letter on one side and number on the other

Which card(s) do you need to turn over to see if this statement is false: "If a card has a vowel on one side, then it has an even number on the other side."

Kahneman and Tversky

A cab was involved in a hit and run accident at night. Two cab companies, the Green and the Blue, operate in the city. 85% of the cabs in the city are Green and 15% are Blue. A witness identified the cab as Blue. The court tested the reliability of the witness under the same circumstances that existed on the night of the accident and concluded that the witness correctly identified each one of the two colors 80% of the time and failed 20% of the time. What is the probability that the cab involved in the accident was Blue rather than Green knowing that this witness identified it as Blue?"

GUESSED

	Blue	Green		
IS				
Blue	12	3	=	15
Green	17	68	=	85

The Answer: 12/29 = 41%

DNA analysis has made the legal system aware of the risk of base rate neglect.

Pronin et al.

Psychologists have claimed that people show a "self-serving" tendency in the way they view their academic or job performance. That is, they tend to take credit for success but deny responsibility for failure; they see their successes as the result of personal qualities, like drive or ability, but their failures as the result of external factors, like unreasonable work requirements or inadequate instruction.

People acknowledge that they are subject to this bias, but believe they are less subject to it than:

Their colleagues

The general population

How does forensic linguistics deal with these problems?

There is currently a divide, both methodological and cultural, between those who apply algorithms and those who testify about particular stylistic markers that are salient in individual cases.

On Speaker or Authorship Attribution

There is absolutely no research proving that the writing style or the voice of any single individual is unique. None.   Linguists speak in court about "idiolects" but there is no way of knowing either whether style is unique or whether a particular sample contains a unique style even if there is such a thing.

On Plagiarism

There is, however, evidence that particular utterances are likely to be unique. Take any 10 consecutive words from any document and paste those words into a Google window. You will find that the 10 words are unique, or that they are a direct quote, or that they are plagiarized. (from Malcolm Coulthard)

From Carole Chaski

Scientifically respectable methods for author identification should be:

a. developed independent of any litigation;

b. tested for accuracy outside of any litigation;

c. tested for accuracy on "ground truth" data;

d. able to work reliably on "forensically feasible" data;

e. tested for known limits correlated to specific accuracy levels;

f. tested for any errors of individual testing techniques that

could cause accumulated error when combined with other techniques;

g. replicable;

h. related to a specific expertise and academic training;

i. related to standard ("generally accepted") techniques

within the specific expertise and academic training; and

j. related to uses outside of any litigation in industries or

fieldwork in the specific expertise.

But…missing are

k. Transparency;

l. Subject to independent proficiency testing. Self-declared replicability not good enough.

Lucy and Lacy

- Lucy is a computer scientist (here in this room), whose algorithm gives her 84% accuracy in a cross-validation study. She testifies from time to time.

- Lacy is a forensic linguist who looks for stylistic markers that a questioned document has in common with a reference set, or from which a questioned document diverges from those in a reference set. She testifies from time to tiem.

The Problem

When it comes to authorship identification, we don't know who is better at it: Lucy or Lacy.

The Current State of Forensic Linguistics

More Lacys than Lucys testifying

University degrees in UK and US in forensic linguistics from departments that don't do much linguistics.

Some Disturbing Trends in Forensic Linguistics

Some very good ideas, but no validation studies, at least not yet.

Drawing inferences about individual data by comparing it to population means.

What Should Happen Now?

1. Computational linguists should continue their work.

2. Non-computational linguists should team up with them to add power through linguistic insight.

3. At least in the short-run, proficiency testing is essential because of the biases I've discussed.

For now at least, the best Lacys may achieve better results than the best Lucys

Let her prove it.

Current Proficiency Competitions

- Directed toward computational linguists and phoneticians, but now welcoming those who make human judgments:

- Authorship: PAN/CLEF

- Speaker: NIST evaluations

What We Are Doing in Brooklyn
(Not Including Basketball)

2012 conference on authorship attribution (sponsored by NSF) brought together forensic linguists, some computer scientists, and evidence scholars who commented on the legal system's reaction to the approaches.

Goto www.brooklaw.edu/cognition and click on publications to download the proceedings.

Participate in our new authorship web page, about to be launched but available now. You can post links to your work, tell us of your testimony in court, and submit comments on current trends.

- ▣ Authorship.brooklaw.edu.
- ▣ Write to authorship@brooklaw.edu

Trademark Confusion: Another Example

The Legal Issue

Are people like to confuse the two names so that the associate one with the other?

The question is not whether people say the words differently, it is how they are perceived by hearers.

Using Standard Linguistic Methods in Trademark Cases

1. Make recordings of "Lexis" and "Lexus" in context. Multiple speakers making multiple recordings.

I just bought a Lexus.

I just signed up to replace Westlaw with Lexis.

2. Remove the words from the contextual sentences.

3. Test random subjects and determine whether they can hear the difference.

The Take-Away

Use the established methods of a field in expert analysis. If there is no established method for a forensically-relevant inquiry, then use standard scientific methods to develop one.

Thank you.