LING 411
Topics in Applied Phonetics

For Tuesday, Nov. 15
Read Fraser, Stevenson & Marks
prepare for a mini-quiz (10 – 15 min)
Content Determination/Disputed Utterances

Purpose:
Determining *what* was actually said on a recording

Situations:
911 calls
voicemail/answering machine calls
cockpit voice recordings
Content Determination/Disputed Utterances

“Black” boxes are actually orange!

Purpose:
Determining what was actually said on a recording

Situations:
911 calls
voicemail/answering machine calls
cockpit voice recordings
phone recordings (e.g., from recorded video)

Difficulties:
background noise
cross-talk
unclear voice (low volume, poor articulation)
speaker distress
multiple language (e.g., in cockpit)
Content Determination/Disputed Utterances

Techniques

Transcription

Lay interpretation of “transcription” = writing out in standard orthography

Forensic Phonetician: Expert listening with transcription (IPA or not)

in general, phoneticians are better at most types of listening tasks than are linguistically-untrained listeners, including sound engineers

➔ NB: Sound engineers sometimes undertake determination tasks (and may be severely criticized by phoneticians because they do not usually understand phonetics or be aware of the biases that they may be subject to).

Case

Uncontroversial lay “transcription”

Flying Tiger Line (international cargo airline)

Boeing 747 (Flight 66)
Kuala Lumpur, February 18, 1989

**ATC – Pilot Transcript**

?>> ATC: Descend to two seven zero zero  
[meaning: 2700 ft]

Pilot: Roger, cleared to two thousand seven hundred. We’re out of forty-five.

?>> ATC: Descend two four zero zero  
[meaning 2400 ft]

And then the response from the pilot ....

**ATC – Pilot Transcript**

?>> ATC: Descend to two seven zero zero  
[meaning: 2700 ft]

Pilot: Roger, cleared to two thousand seven hundred. We’re out of forty-five.

?>> ATC: Descend two four zero zero  
[meaning 2400 ft]

And then the response from the pilot ....

Pilot: OK, four zero zero  
[meaning 400 ft]
Pilot: OK, four zero zero. [meaning 400 ft]

Subsequently:

- Plane descends
- Ground proximity warning goes off
- Crew ignores it.

ATC – Pilot Transcript

- Plane crashes 8 miles from runway killing all 4 crew.
- No passengers were aboard.
Intelligibility error is apparently due to stress & reduction phenomena;

however, no phonetic analysis is available

McMillan (1998, emphasis added):

Controllers *often* encounter this problem with these homonyms and appear to use two different techniques to overcome it.

One is to pronounce ‘to’ as ‘tah’; the other is to emphasise ‘to’ as in “descend **to two seven zero zero**”.
In this case, it may be that ATC used NEITHER strategy

NASA: thousands of cases of language-related confusions in ATC communications (Cushing, 1995)

Case

Highly controversial case:

David Bain (see Fraser et al)
David Bain Case (NZ)

convicted of murder of his family members
retried, and acquitted 14 years later

111 Call NZ = 911 call in Canada

David Bain Case (NZ)

Central issue in retrial: presentation of evidence

Should the jury be allowed to hear a particular part of the original 111 call?
David Bain Case (NZ)

Central issue in retrial: presentation of evidence

Should the jury be allowed to hear a particular part of the original 111 call?

- Crown prosecutor wished to present this evidence, argued that it contained incriminating words (confession)
- Defense argued that it was irrelevant because it contained no speech at all

David Bain Case (NZ)

Judge’s ruling:

not relevant
presentation of this evidence would be prejudicial
she disallowed it
Forensic linguists have put David Bain’s 111 call under the microscope and showed that when it came to the alleged statement “I shot the prick”, it was more in the mind than on the tape.

And crucially, it seems police officers were more likely to hear the disputed phrase than others.

Bain’s 1994 emergency call became a bone of contention in his 2008 trial for the murder of his parents, two sisters and brother at the family’s home in Dunedin, when he was found not guilty. A police officer digitising the tape thought he heard the previously unheard statement “I shot the prick”, though that part of the tape was successfully challenged by the defence and not played to the jury. It generated sensational headlines when media obtained the recording after Bain was found not guilty.

Australian expert in forensic phonetics, Helen Fraser, has studied the tape and played the disputed section to 190 people from Australia, New Zealand, the UK and the US.

Of those, only four people heard the breathy snippet as “I shot the prick” without being told what to listen for.

Fraser’s interest was piqued when it was discovered that two of those four “unprimed listeners” were police officers, both were from Australia and had no prior knowledge of the case.
Content Determination/Disputed Utterances

Purpose:
Determining what was actually said on a recording

Situations:
911 calls
voicemail/answering machine calls
cockpit voice recordings
phone recordings (e.g., from recorded video)

Difficulties:
masking effects due to background noise
cross-talk
unclear voice (low volume, poor articulation)
speaker distress
multiple language (e.g., in cockpit)

Content Determination/Disputed Utterances

Techniques

Audio Enhancement

background noises
appliances, phone line, multi-speaker babble, traffic

alarms
burglar alarm, cockpit voice alarm, fixed frequency tones
Content Determination/Disputed Utterances

Techniques

Audio Enhancement

- sound engineers really are the experts, though some phoneticians have training in procedures

HOWEVER, engineers often do not understand the limitations and dangers of their techniques in evaluating speech; nor do they necessarily know about the notion of “certainty” in forensic phonetics

filtering: high-pass, low-pass, band-pass filters, band-stop filters (“notch filter”), noise profile filtering

filtering is most effective when the material to be removed has constant acoustic properties (same spectrum)

other (closely related) approaches: isolation of relevant sections, “boosting” or transformation of certain components