Intra-language intonational variation: theoretical and practical aspects

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Introduction

Today, unlike in the past, intonation is included in the study of variation:
- speech is seen in terms of a prosodic hierarchy
- there’s a degree of consensus on how to model intonation
- auditory-acoustic analysis is accessible
- acoustic analysis of large data sets has become technically feasible

Introduction

- There have been projects on a number of languages including the prosody of dialects
  - (UK) English
  - Irish
  - Swedish
  - Arabic
- I’ll focus mainly on the IViE project in Cambridge

The IViE project

- Intonational Variation in English (1997-02)
- official title ‘English Intonation in the British Isles’
- funded by ESRC Grant R000237145
- PIs Francis Nolan, Esther Grabe
- RAs Kimberley Farrar, Brechtje Post

Cambridge
Cardiff
Liverpool
Dublin
Belfast
Newcastle
Leeds
Cambridge
Bradford (Asian) ‘Cinderella’

Bradford (Asian) ‘Lily and Rosa were… [very unfriendly]’

An aside
- If you ever want to induce speech errors experimentally in read speech, try
  - ‘Cinders lived with her mother and two stepsisters….’

Tactical decisions 1
- Which dialects? Depends on the aim(s):
  - make a geographical survey
  - capture historic (=rural?) or contemporary (=urban?) forms
  - do sociophonetics
  - test hypotheses arising from facts already known or suspected

Tactical decisions 2
- What data?
  - naturalistic (for ‘ecological validity’) vs. controlled – a pervasive debate in phonetics

IViE recorded a range of styles:
  - read sentences (all-voiced words in nuclear position)
  - read story
  - spontaneous re-telling of the story
  - 2 subjects debating a ‘hot topic’

Styles recorded in IViE
- Read sentences
  - easiest way to control e.g.
    - number of syllables in accent units
    - utterance function (Q vs statement)…
  - low on naturalness
  - depends on passable level of literacy

Styles recorded in IViE
- Read story
  - allows a lot of control (though not greatly exploited in the IViE story)
  - less unnatural than sentences
  - may elicit discourse features (perhaps stylised)
  - requires good level of literacy
Styles recorded in IViE

- Retold story
  - some control over lexical content
  - natural and spontaneous
  - not interactive
  - may elicit discourse features
  - requires reasonable memory and fluency

- Debate between 2 subjects
  - very little control over content and structure
  - spontaneous
  - interactive
  - potentially lively
  - requires fluency and discourse skills

Tactical decisions 3

- What subjects?
  - depends on purpose and availability
  - IViE used 17-year-old school students
    - relatively homogeneous (had to be ‘native’)
    - non-mobile
    - relatively literate
    - reasonably accessible

Tactical decisions 4

- A database?
  - will one be made available?
    - the IViE corpus has been used a lot, even though it’s far from ideal for most research
    - how much of it will be transcribed / labelled?
    - what format will it be in?

Tactical decisions 5

- How to analyze?
  - listening & looking (‘combined auditory-acoustic method’)
  - what intonological framework?
    - kinetic ‘British’ (rises, falls, etc.)?
    - autosegmental metrical (H, L, % etc.)?
    - in either case, which ‘flavour’?
    - IViE developed a compromise AM model

The IViE model

- Compromise between ToBI & the ‘British’ tradition, influenced by Gussenhoven
- Aims: greater ‘transparency’ of description; more compatibility with ‘British’ analyses
  - pitch accents all ‘left-headed’, e.g. H*+L
  - IP boundaries can be 0%, as well as H%, L%
  - ‘displacement’ possible in bitonal pitch accents: H*_+ L
All pitch accents left-headed

- \([*T+T, \text{no } T+T^*]\) Matches ‘British’ marking of /, \, etc before stressed syllables
- Avoids some potential ambiguities of interpretation
- Makes a strong theoretical claim
  - probably too strong; rules out some potentially useful analyses with esp. H+L*

Unspecified boundary (0%)

- Avoids
  - opaque notation (e.g. H-L%) of plateaus
  - marking pitch (L%) when no new pitch occurs
- Doesn’t \textit{in fact} add a ‘third value’ to the bi-valent AM system, any more than do:
  - not marking pitch on a ‘neutral’ anacrusis OR
  - on a stressed syllable with no new pitch

‘Displacement’ in bitonal accents

- Embodied Gussenhoven’s (debatable) claim that the following are (rate?) variants:
  - he ran all the way to the station

The intonological framework

- Your model of intonation
  - shapes the research questions
  - defines equivalent events for comparison (across contexts, dialects…)
  - provides for a classification of intonational differences

Classification of differences

- Intonational categories – contrastive patterns in a dialect, e.g. a rise vs. a fall…; H% vs L%…
  - ‘systemic’ differences
  - differences of function
- Realisation
  - details of how those categories are produced, e.g. earlier / later fall
- Utterance-level differences
  - aspects of the overall melody

Systemic differences

- …when a dialect has more or fewer phonemes /intonemes than another
  - Knowles’ (1974) study of Liverpool claims it has two extra ‘nuclear tones’
Systemic differences

- ...and Northern Irish English, unlike SSBE
- lacks a ‘fall-rise’
- but has a ‘rise plateau’

Categories and function

- Grabe & Post (Speech Prosody 2002)
- counted ‘nuclear’ patterns (last pitch accent + boundary tone) in four of the dialects

Differences in realisation

- Categories alone would fail to capture a dialect’s prosody.
- Other factors could be broadly termed ‘realisational’
- One such is ‘truncation vs compression’
  - does a dialect ‘compress’ a pitch pattern onto short material, or sacrifice the end of it

Truncation vs. compression

  - compared four English varieties
  - 6 male, 6 female speakers for each
  - used read sentences varying the duration of voiced material available for the ‘nucleus’

1as part of the IViE project, but not as part of the corpus
Conclusions: truncation and compression

- Compression is almost certainly a gradient phonetic matter, not deletion of a tone
  - if so, it is clearly ‘realisational’
- Dialects (and languages) appear to be able to choose whether they compress or not

Realisation or category?

- Ultimately the distinction between these isn’t watertight.
- For instance, how far can we let a peak ‘lag’ after a stressed syllable while still regarding the stressed syllable as H*?
Accents of Irish (Gaelic)

- Martha Dalton & Ailbhe Ni Chasaide (Dublin) have built on IViE, for Irish
- Following data are taken (with kind permission) from Dalton & Ni Chasaide’s 2004 TIE presentation http://www.let.kun.nl/tie/defooltcon.htm
- Dialects of Connaught, e.g. Connemara, seem to have different peak timing from Donegal…

**Connemara Peak Alignment**

- Initial peak lags
- Peak ‘catches up’ with lexically stressed syllable as utterance proceeds (cf. SBE)
- No reason to question H* as the default accent

**Donegal Peak Alignment**

- All peaks lag; no attempt to align with stressed syllable
- Pitch consistently low in lexically stressed syllables
- L*+H is the only transparent analysis

**Within-Connaught variation**

- Mayo, Connemara, and Aran Island Irish all have default H accents
- Both initial and final accents show different alignment trends
- For instance Mayo, nearer to Donegal, lags final peaks on polysyllables (but so does Aran…), more or less the reverse of Connemara
Summary: categories and realisation

- Intonation is richly differentiated in dialects by both these mechanisms
- The dichotomy is not always clear from the signal, but the phonological aspects of intonation (contrast, contextual variation) oblige us to operate with categories

Utterance-level differences

- Some differences in dialect prosody seem to be global rather than specifically related to categories or their realisation
- One such area could be broadly termed ‘pitch range’

Pitch range

- A challenging area because
  - it straddles the linguistic and non-linguistic, the discrete and the gradient
  - it is affected by external factors as well as being under the speaker’s control
- Nonetheless, intuitively languages and dialects are characterised the ‘cadence’ of the voice

Dialect differences in pitch range

- Impressionistic observation of a difference in ‘downtrend’ in Dublin
  - Dublin
  - Leeds
  - Dublin ‘starts high’??
- Pilot experiment using IViE corpus (one sentence from read ‘Cinderella’ story)
Pitch range: conclusion

- Provisionally, there seems to be a difference of ‘local down trend’
- Leeds males are the odd ones out, lacking the large first step
- There may be an interaction between a dialect feature and gender
- The feature needs to be tested on more data, and more ‘naturalistic’ data

Dialect intonation: conclusion

- Many factors contribute to the intonation which characterises a dialect
- Some can be described in terms of categories, but many are at the level of detailed phonetic realisation
- New methods are succeeding in capturing these
- But we’re a long way from explaining the differences w.r.t. general properties

The End