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

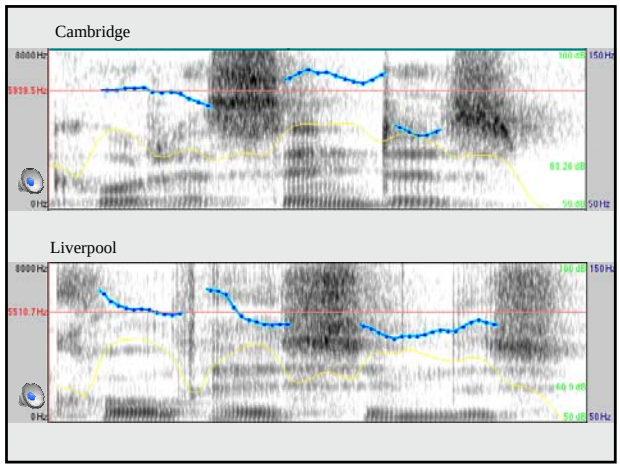
Introduction

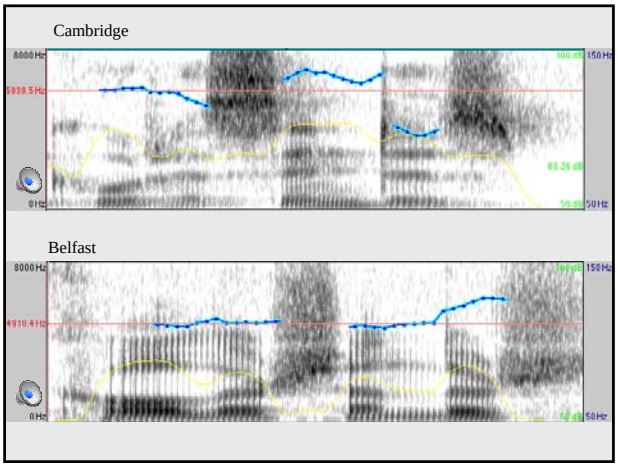
- There have been projects on a number of languages including the prosody of dialects
  - (UK) English
  - Irish
  - Swedish
  - Arabic
- I'll focus mainly on the IViE project in Cambridge

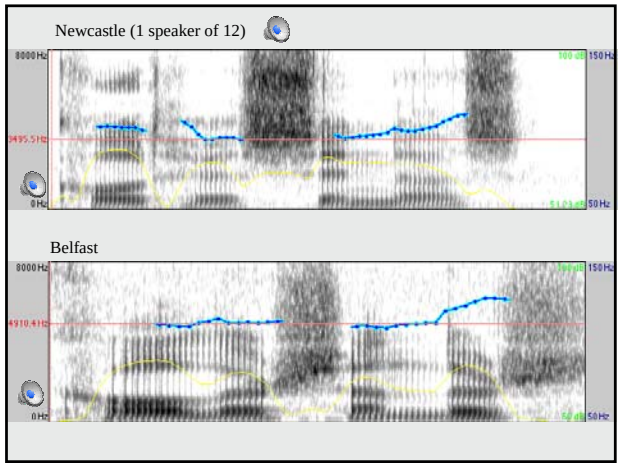
The IViE project

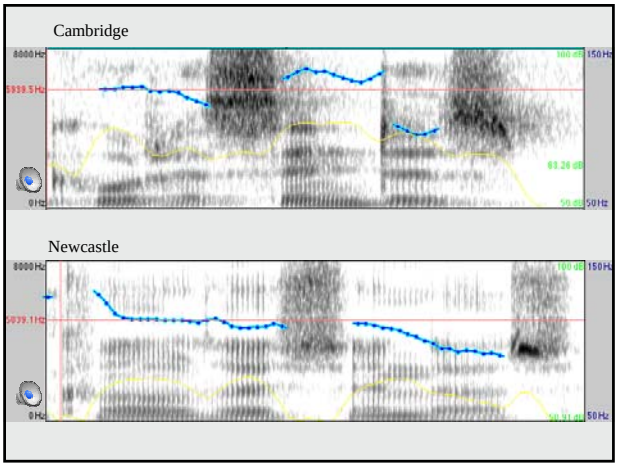
- Intonational Variation in English (1997-02)
  - official title 'English Intonation in the British Isles'
  - funded by ESRC Grant R000237145
  - PIs Francis Nolan, Esther Grabe
  - RAs Kimberley Farrar, Brechtje Post

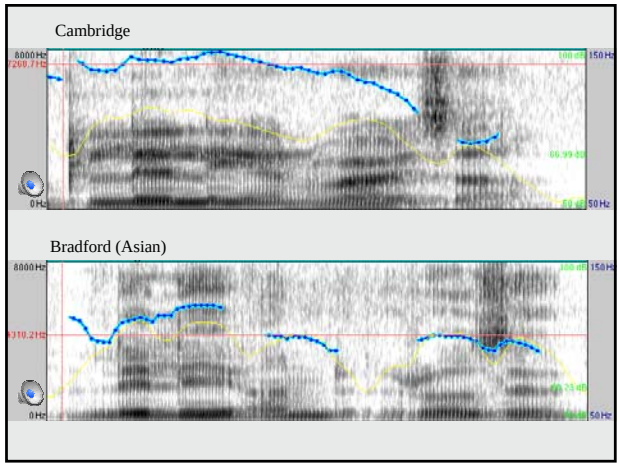

Bradford
London


Cambridge
Liverpool

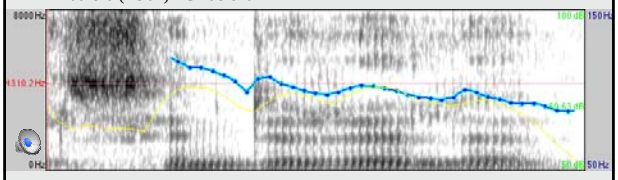

Cambridge
Belfast


Newcastle (1 speaker of 12)
Belfast

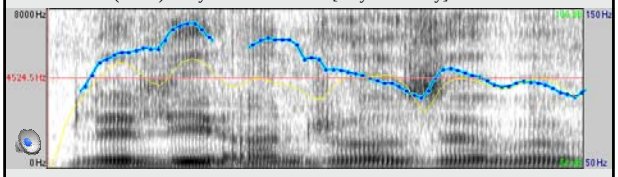

Cambridge
Newcastle


Cambridge
Bradford (Asian)

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

Styles recorded in IViE

- 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, 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*

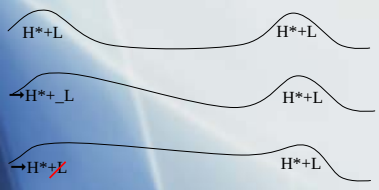
Unspecified boundary (0%)

- Avoids
  - opaque notation (e.g. H-L%) of plateaus
  - marking pitch (L%) when no new pitch occurs
- Doesn't *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

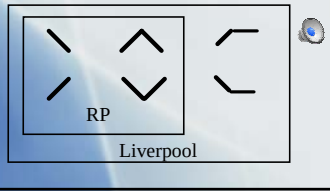
- Your model of intonation
  - shapes the research questions
  - defines equivalent events for comparison (across contexts, dialects…)
  - provides for a classification of intonational differences

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

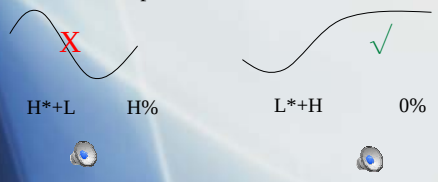
Systemic differences

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



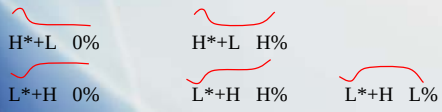
Systemic differences

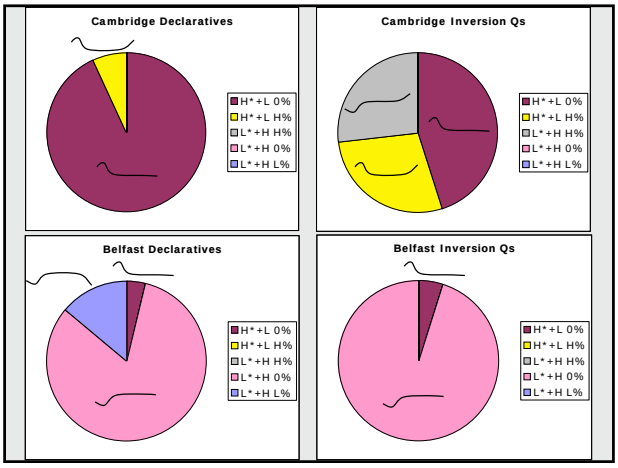
- …and Northern Irish English, unlike SSBE
  - lacks a ‘fall-rise’
  - but has a ‘rise plateau’



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

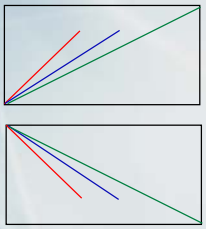
- Grabe, Post, Nolan & Farrar (2000, *JPhon*)
  - compared four English varieties[1]
  - 6 male, 6 female speakers for each
  - used read sentences varying the duration of voiced material available for the ‘nucleus’

[1]as part of the IViE project, but not as part of the corpus

‘Anna and Peter were having dinner. Peter said: who do you think I met in the market today?’

Mr { Shift / Sheaf / Sheafer } , Anna { replied. / asked? }

Cambridge

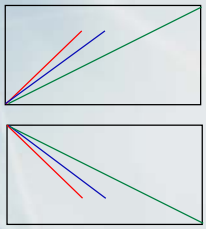


Shift

Sheaf

Sheafer

Newcastle



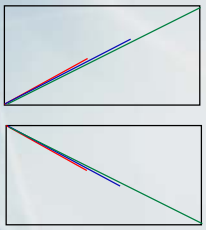
dur. not sig. diff

Shift

Sheaf

Sheafer

Leeds



Shift

Sheaf

Sheafer

Results

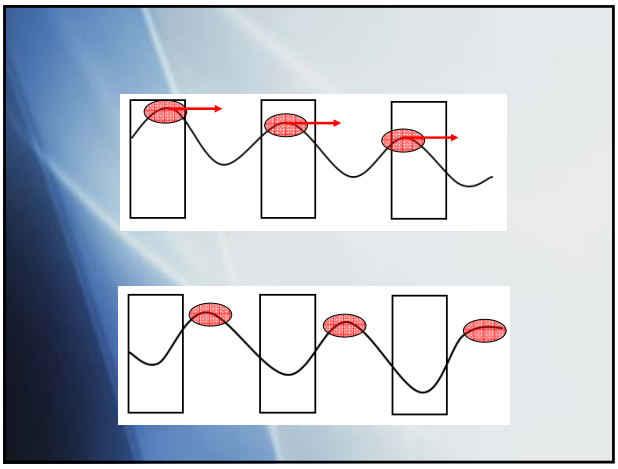
	RISE	FALL
SSB	compresses	compresses
Newcastle	compresses	compresses
German	*compresses*	*truncates*
Leeds	truncates	truncates
Belfast	truncates	–

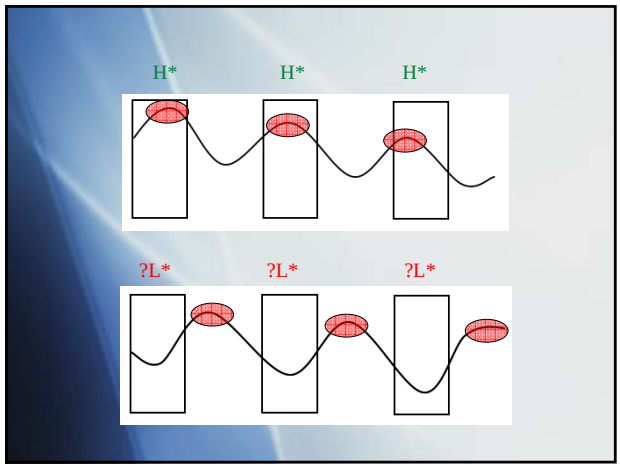
Conclusions: truncation and compression

- 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 choose whether they compress or not

Realisation or category?

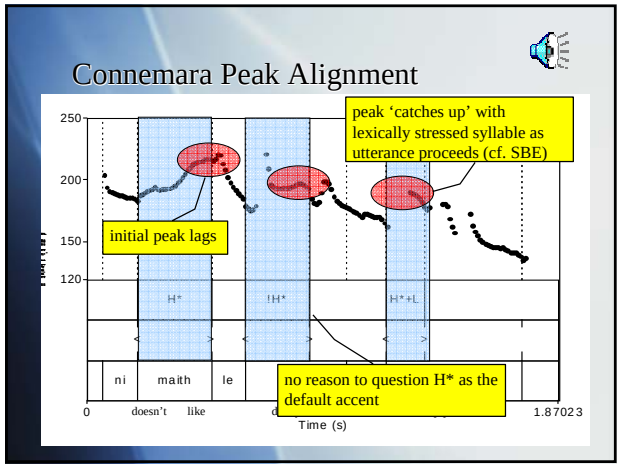
- Ultimately the distinction between these isn’t watertight.
- For instance, how far can we let a peak ‘lag’ after a stressed syllable while still regarding the stressed syllable as H*?

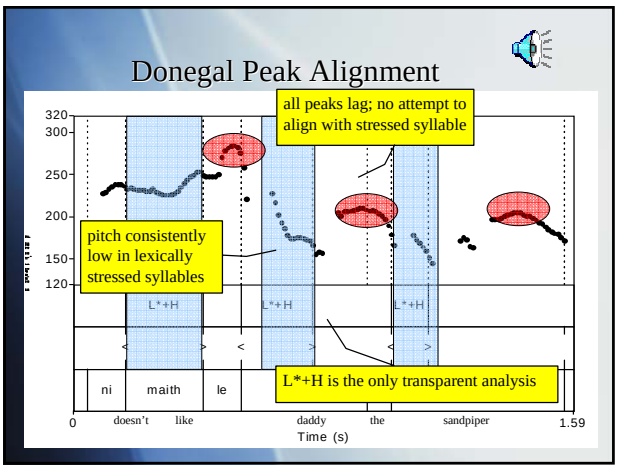




Accents of Irish (Gaelic)

- Martha Dalton & Ailbhe Ní Chasaide (Dublin) have built on IViE, for Irish
  - Following data are taken (with kind permission) from Dalton & Ní 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…

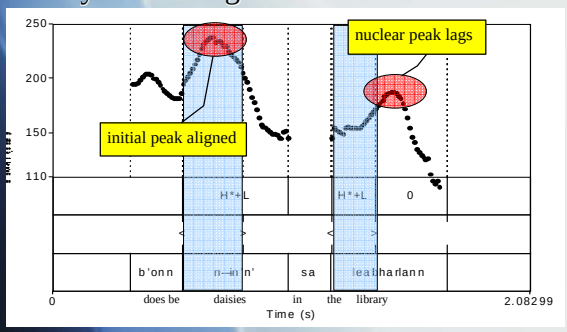




Within-Connaught variation

- 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

Mayo Peak Alignment



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

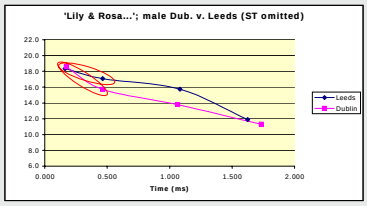
- Some differences in dialect prosody seem to be global rather than specifically related to categories or their realisation
- One such area could be broadly termed 'pitch range'

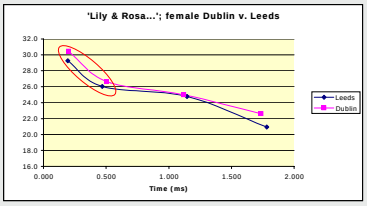
Pitch range

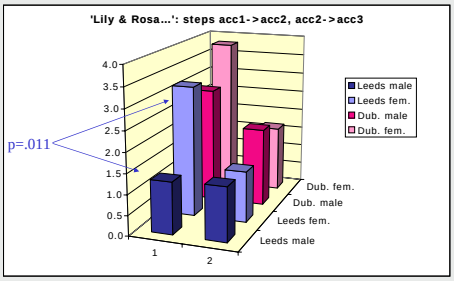
- A challenging area because
  - it straddles the linguistic and non-linguistic, the discrete and the gradient
  - it is affected by external factors as well as being under the speaker's control
- Nonetheless, intuitively languages and dialects are characterised the 'cadence' of the voice

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 downtrend'
- 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

Dialect intonation: conclusion

- Both practical and theoretical dilemmas arise in planning work on dialect intonation
- In terms of data collection:
  - there's a trade-off between 'ecological validity' and control
  - corpora will never provide quite the right data *post hoc*
  - non-standard intonation is at least as fragile as segmental phonetics in polylectal speakers

Dialect intonation: conclusion

- In terms of theory:
  - no description, or even data collection, is theory-neutral
  - a consistent framework is needed to allow comparison across dialects
  - one that is compatible with work on other languages, but flexible if the facts of the target language demand it
  - there is a trade-off between theoretical sophistication and accessibility of descriptions

The End