

/ɪ, ə/-lowering in Manchest[ʌ]: contextual patterns of gradient and categorical variability[ɛ]

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- 1 Introduction
 - Background
 - Previous Studies
- 2 The Experiment
 - Methodology
- 3 Results
 - *happy*
 - *letter*
 - Discussion
- 4 Conclusion

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The unstressed (or weak) vowels of English

Wells's (1982) *happy* and *letT*ER lexical sets.

■ *happy*:

- the final vowel in *city, baby, lily, sorry*
- can include compounds of *day* e.g. (*Friday, holiday*)
- Has a near-close quality in conservative RP: e.g. [hæpɪ]

■ *letT*ER:

- the final vowel in *paper, sugar, centre, pressure*
- merged with the *comma* set in non-rhotic varieties,
- usually transcribed with final schwa e.g. [lɛtə]

1 Introduction

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- Previous Studies

2 The Experiment

- Methodology

3 Results

- *happy*

- *letter*

- Discussion

4 Conclusion

Previous studies: *happy*-tensing

- Previous studies on the unstressed vowels of English are dominated by so-called *happy*-tensing (where the unstressed vowel has shifted towards [i]):
 - Harrington (2006) studied changes in the Queen's *happy* vowel over 50 years of Christmas broadcasts, showing that the vowel has become higher and marginally fronted during her lifespan.
 - Fabricius (2002) observes that modern RP speakers are now far more likely to have a tense variant, finding [hæpi] rather than [hæpɪ] in her speaker data.

Previous studies: *happy*

- But northern dialects typically do not exhibit *happy*-tensing:
 - Urban dialect studies mention that phrase final *happy* has a more open quality in northern dialects (e.g. Foulkes & Docherty, 1999, 2007:66; Wells, 1982) .
 - Lodge (1978) transcribes the *happy* vowel as [ë] phrase finally in his study on the Stockport dialect (part of Greater Manchester).
 - However, phonetic research on the *happy* vowel is scarce (but see French et al. (2012) on Tyneside; Flynn (2010, 2010a) on Nottingham).

Previous studies: *letter*

- There is very little research on changes in the *letter* vowel.
 - Tollfree (1999) describes South East London English as having [e] phrase finally.
 - Flynn (2010a) transcribes the Nottingham *letter* vowel with an [ɒ] in this position.
 - Watt & Milroy (1999) say older and working class Newcastle speakers have [e].

/ɪ, ə/ in Manchester

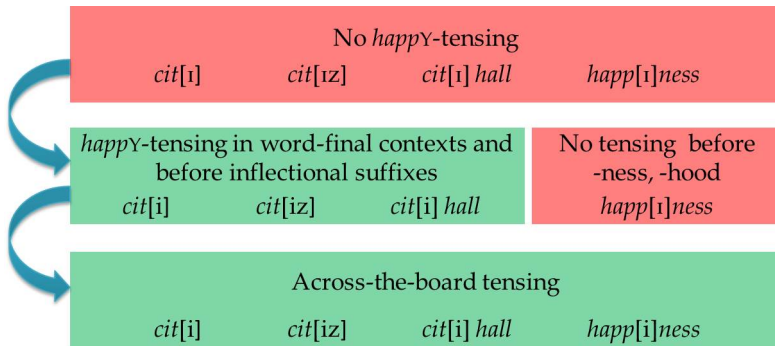
- Impressionistically, both vowels sound lowered and backed in Mancunian English.
 - *happy* sounds more like [ɛ̝].
 - Beal (2008:126) comments that speakers in Manchester have [ɒ] for *letter*. This is a stereotype of Mancunians: that they pronounce their hometown as Manchest[ɒ].
- There is inter-speaker variation which seems to be sociolinguistically conditioned.
 - There are very interesting sociolinguistic aspects to our study, but we're not going to talk about that... today.
- Setting aside these passing observations, there exists no detailed phonetic study of these vowels in Mancunian English.

Phonological conditioning

- Wells (1982:165) notes that lowering/backing of *happy* and *letter* displays contextual variation:
 - Both effects are most auditorily salient in phrase final position.
- Existing research has yet to determine whether lowering/backing of *happy* interacts with lowering/backing of *letter* or whether the two processes occur independently.
- Whether these processes are sensitive to morphology has also never been investigated previously.
 - This is crucial because previous analyses of *happy*-tensing suggest just this.

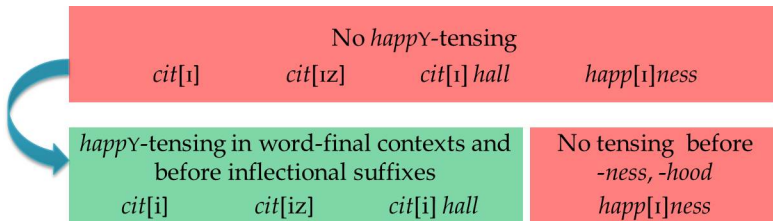
Morphosyntactic aspects of *happy*-tensing

- Halle & Mohanan (1985: 59):
 - Impressionistic observations suggest that *happy*-tensing is sensitive to morphology in some dialects.



Morphosyntactic aspects of *happy*-tensing

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Research Questions

- 1 How is the *happy* vowel realised in Manchester and what (if any) effects of phonological context can be observed?
- 2 How is the *letter* vowel realised in Manchester?
 - Is lowering/backing of the *letter* vowel, as reported in impressionistic descriptions, crucially dependent upon simultaneous use of lowering/backing of *happy*?
- 3 Is the use of *happy*-lowering in Manchester sensitive to morphosynactic factors, as *happy*-tensing is argued to be by Halle & Mohanan?

- 1 Introduction
 - Background
 - Previous Studies
- 2 The Experiment
 - Methodology
- 3 Results
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- 4 Conclusion

The present study

22 speakers from (Greater) Manchester were recorded producing stimuli designed to test /ɪ, ə/-realisations in a range of different phonological environments:

- 1 Absolute phrase-final position
 - e.g. *They had a good party, They wrote a long letter.*
- 2 In nominal plurals before word-final [z]
 - e.g. *parties, letters*
- 3 Word-finally before word-initial [z]
 - e.g. *party zone, letter zone*
- 4 Word-final preconsonantal contexts
 - before /p/ e.g. (*party passed, letter posted*)
 - before /m/ e.g. (*party matters, letter mailers*)
- 5 Word-final prevocalic position
 - before /ɪ/ (e.g. ...*party in...*, ...*letter in...*)
 - before /ɒ/ (e.g. ...*party on...*, ...*letter on...*)
 - before /a/ (e.g. ...*party and ...*, ...*letter and...*)

Procedure

Distracter sentences were also included to divert participants' attention away from the purpose of the study:

Target

*They had a **party** in Fallowfield*
*They wrote a **letter** in Fallowfield*

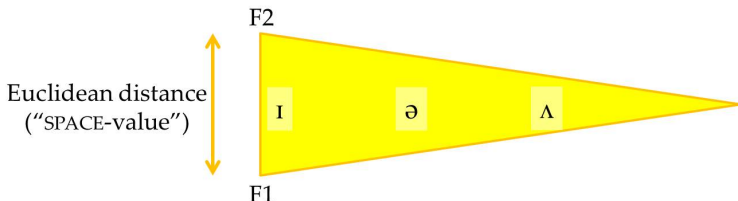
Distracter

*They sent a **parcel** in Fallowfield*
*They bought a **ladle** in Fallowfield*

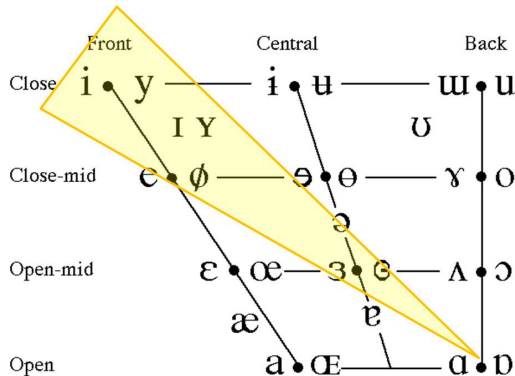
- Speakers read five repetitions of target sentences and five repetitions of distracter sentences.
 - The realisation of /ɪ/ in the *dis-* prefix (e.g. *disgusted*) was also tested to obtain data on the quality of unstressed [ɪ] for comparative purposes.
 - Total of 220 sentences per speaker.

The present study

- Formant frequency measurements for F1, F2 and F3 were extracted at the midpoint of each *happy*/*letter*-realisation.
- Raw formant values (Hz) were converted to Bark and Lobanov-normalised.
- Lowering/backing of *happy*/*letter* quantified by calculating the Euclidean distance between F1 and F2 (henceforth referred to as SPACE-values).



SPACE value aka Euclidean distance

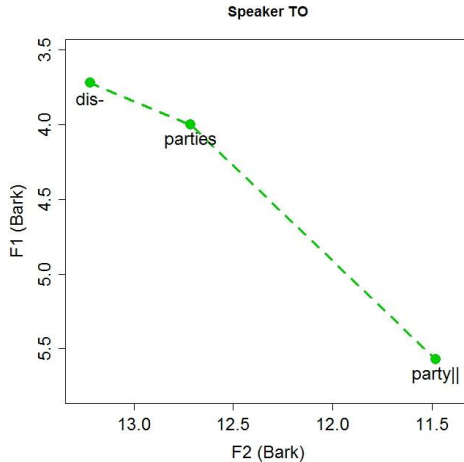


- 1 Introduction
 - Background
 - Previous Studies
- 2 The Experiment
 - Methodology
- 3 **Results**
 - *happy*
 - *letter*
 - Discussion
- 4 Conclusion

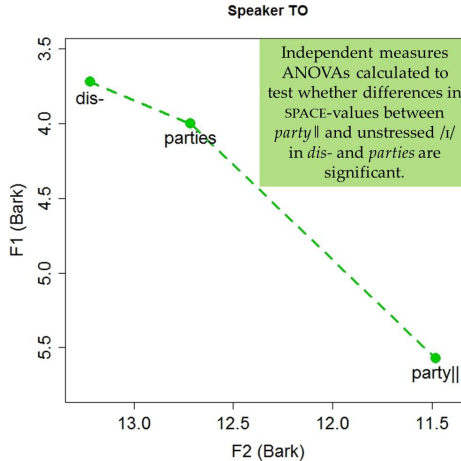
Results: *happy*

- Primary data analysis indicates that the majority of speakers use *happy*-lowering in phrase-final contexts.
 - We refer to these speakers as **users**.
- Speakers were categorised as **users** if they displayed statistically significant **SPACE** value between phrase-final *happy* and the unstressed vowel [ɪ].

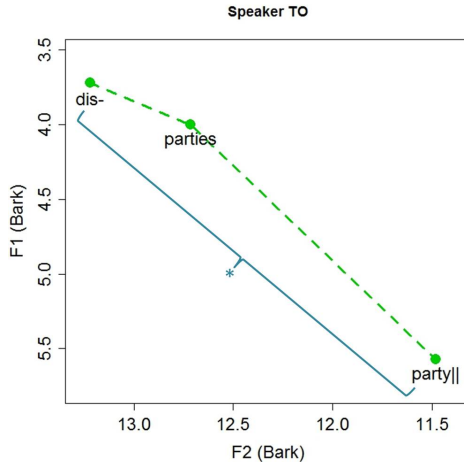
Results: A typical *happy* user



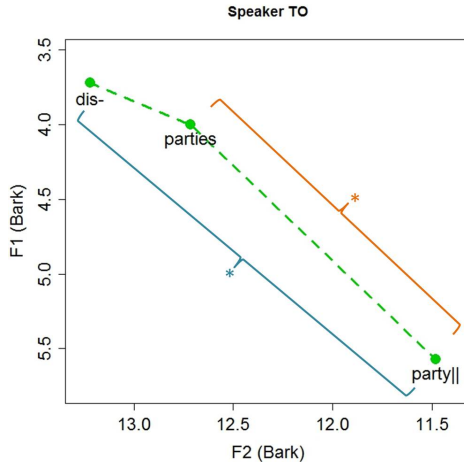
Results: A typical *happy* user



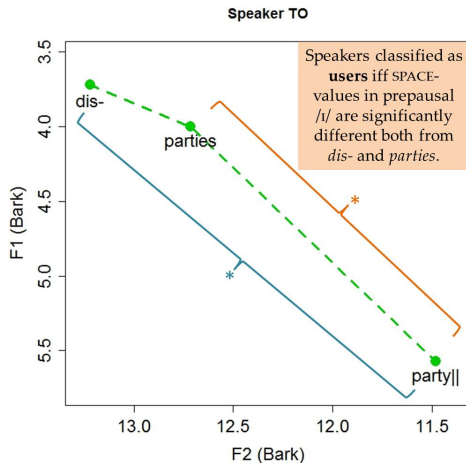
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Results: A typical *happy* user

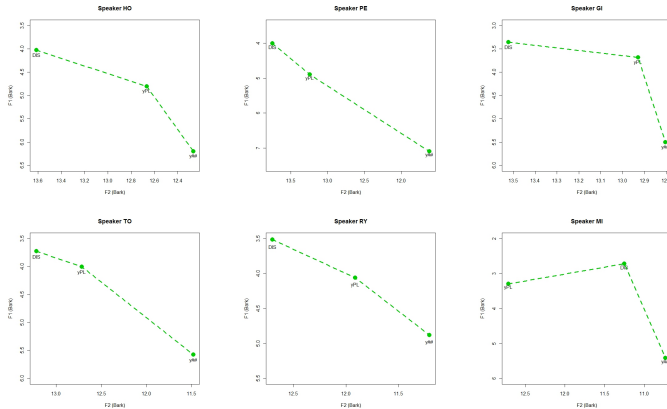


Results: A typical *happy* user



happy users in three contexts

The categorical users all have a significant difference between regular unstressed [ɪ] and the *happy* vowel:

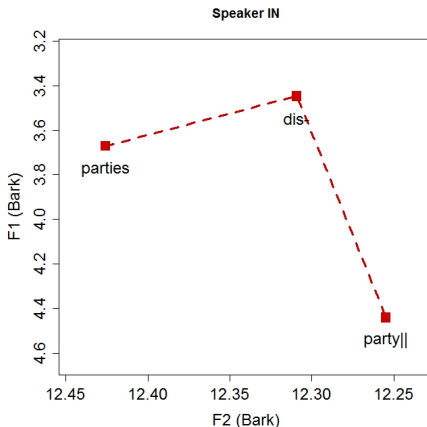


happy results: non-users

- However, some speakers show no significant differences between prepausal *happy*, unstressed [ɪ] in *dis-* and presuffixal [ɪ] in *parties*.

Gradient *happy* lowering phrase finally

There are no statistically significant differences between the regular unstressed [ɪ] and the *happy* vowel in pre-pausal contexts for this speaker.

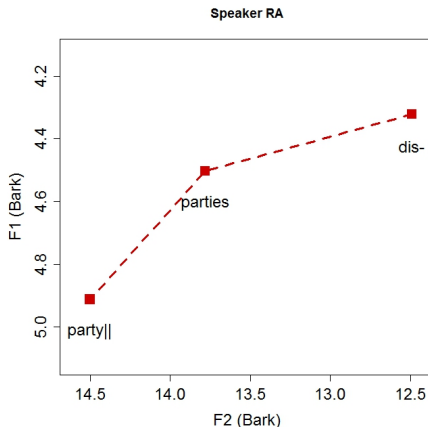


happy results: non-users

- However, some speakers show no significant differences between prepausal *happy*, unstressed [ɪ] in *dis-* and presuffixal [ɪ] in *parties*.
- Two other speakers showed evidence of *happy*-tensing phrase-finally.

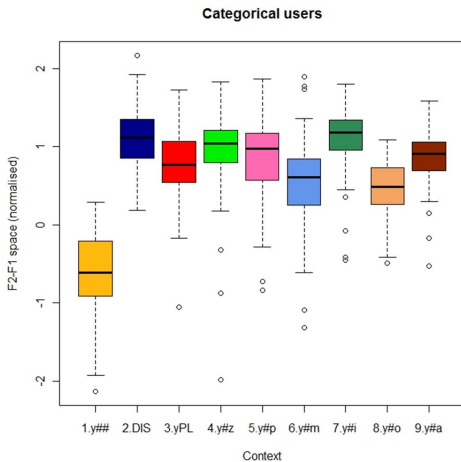
Non-users: A *happy*-tenser

This speaker displays a *happy*-tensing pattern.



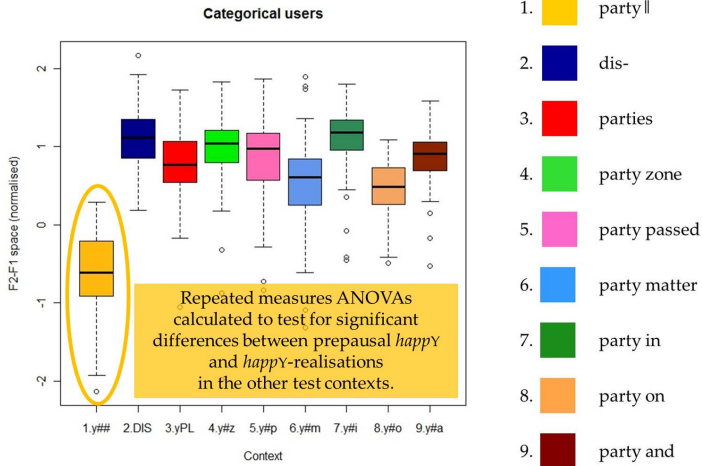
Results: *happy* users

Results: *happy* users

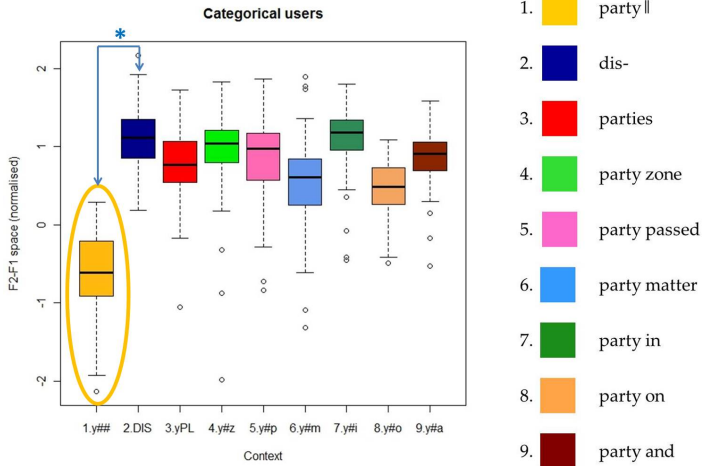


1. party ll
2. dis-
3. parties
4. party zone
5. party passed
6. party matter
7. party in
8. party on
9. party and

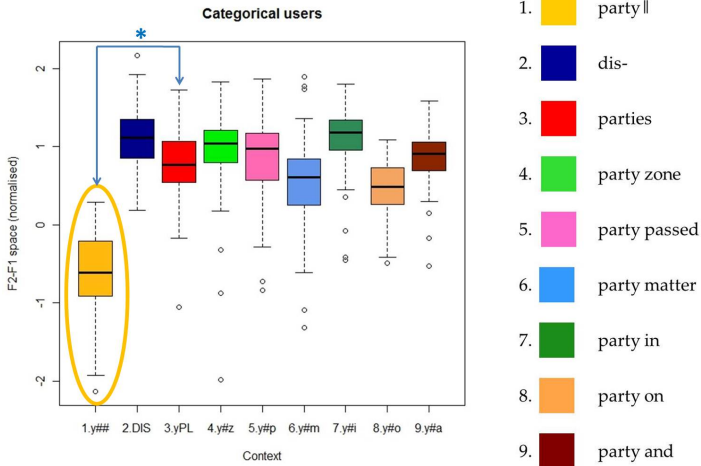
Results: *happy* users



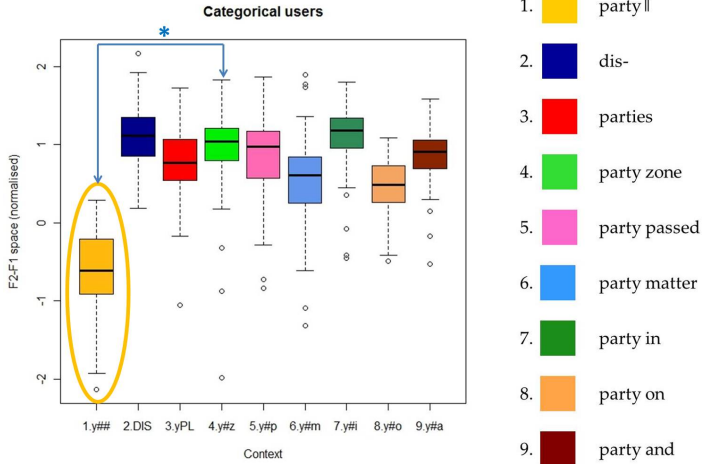
Results: *happy* users



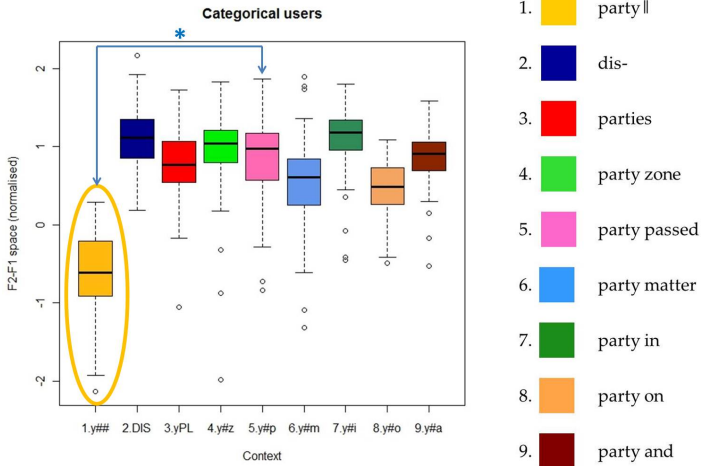
Results: *happy* users



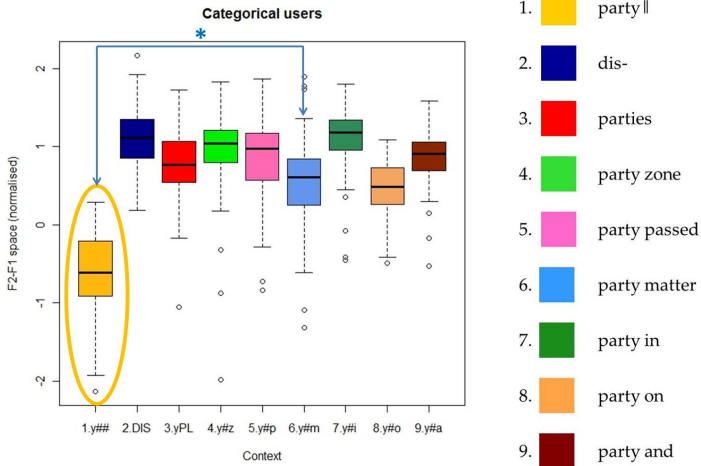
Results: *happy* users



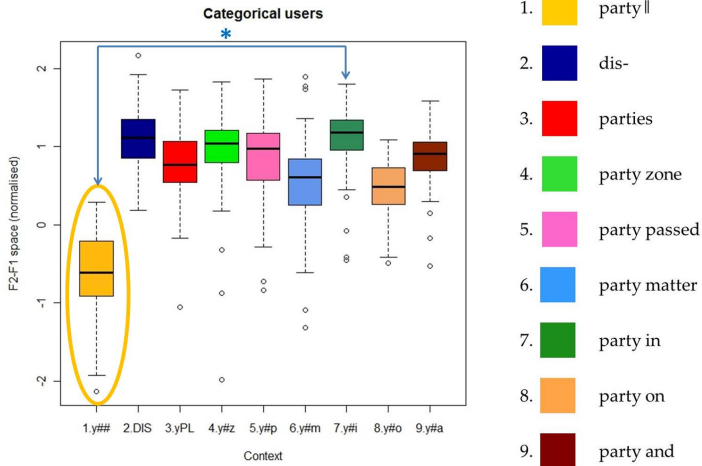
Results: *happy* users



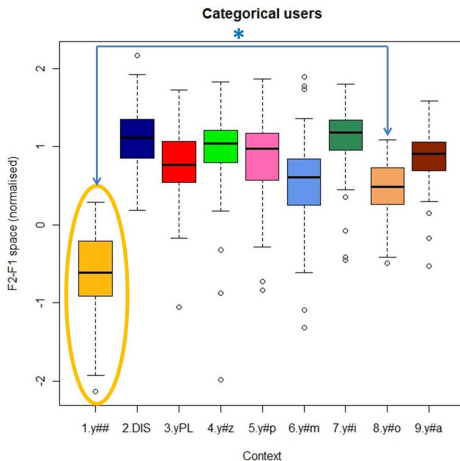
Results: *happy* users



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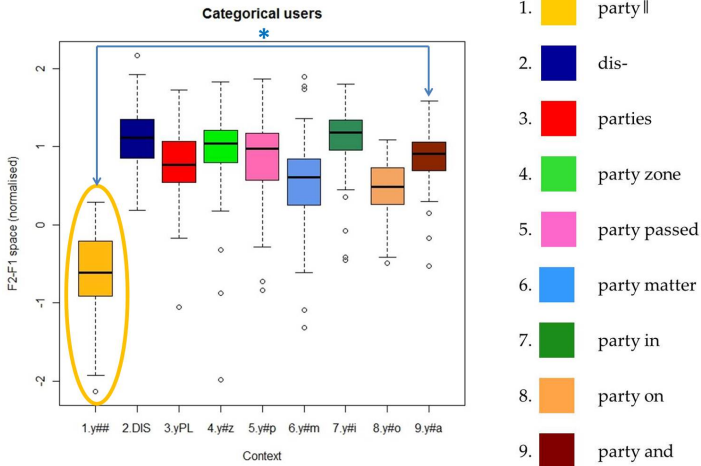


Results: *happy* users



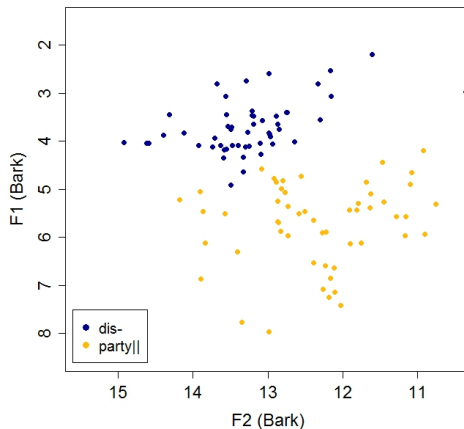
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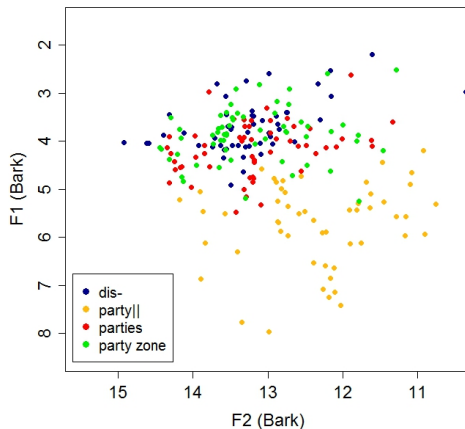


- Statistical analysis of the users' data reveals a clear bimodality:
 - SPACE values are significantly lower in phrase-final /ɪ/ than any other test condition.
 - prepausal /ɪ/ therefore has a very different phonetic target from unstressed ɪ/ in other environments.
 - The consistency of the pattern amongst the users and the robustness of the effect on SPACE strongly suggest that phrase-final *happy* is a homogeneous phonological category for these Mancunian speakers.

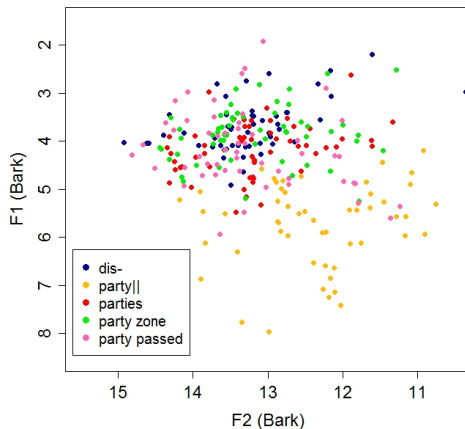
Categorical lowering of phrase final *happy*



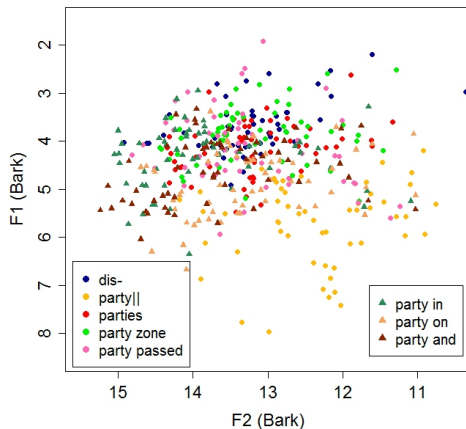
Categorical lowering of phrase final *happy*



Categorical lowering of phrase final *happy*



Categorical lowering of phrase final *happy*



Summary of *happy* results

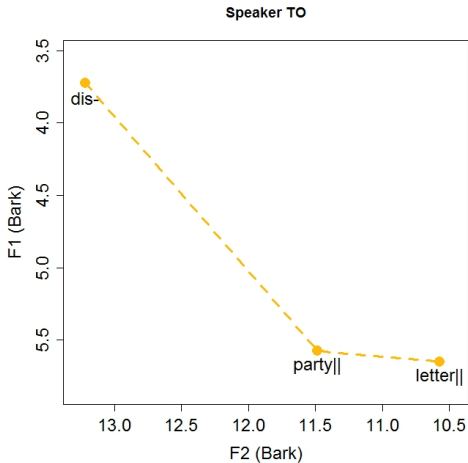
- The majority of Manchester speakers show significant lowering and backing of the *happy* vowel in phrase-final contexts.
- Those that do not
 - either display **gradient** lowering phrase-finally
 - or they show evidence of *happy-tensing*

- 1 Introduction
 - Background
 - Previous Studies
- 2 The Experiment
 - Methodology
- 3 **Results**
 - *happy*
 - **lettER**
 - Discussion
- 4 Conclusion

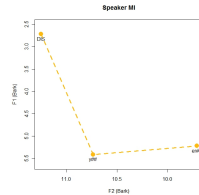
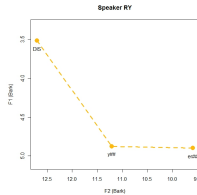
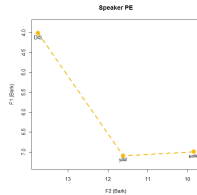
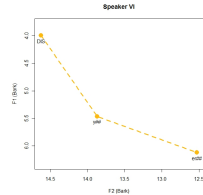
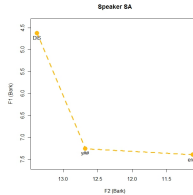
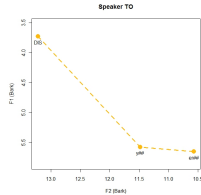
letter

- Whereas for phrase-final *happy* we observe robust lowering and backing for all the users, the difference between phrase-final *happy* and phrase-final *letter* is less extreme than the impressionistic dialect descriptions suggest.
- For all speakers who use categorical *happy*-lowering, SPACE-values are generally lower for phrase-final *letter* than for phrase-final *happy*.
- Surprisingly, however, there is little evidence that *letter* has an open quality: the effect obtains because *letter* is significantly *backed* relative to phrase-final *happy*.

Plot of a typical user

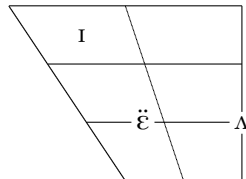


A comparison of *letter* and *happy* vowels



The *letter* vowel in Manchester

- This evidence indicates that the speculative comments that the Manchester *letter* vowel is closer to [ɒ] are somewhat exaggerated.
- The Manchester *letter* vowel has a quality closer to [ʌ].
- Impressionistically, some *letter* vowels sound partially rounded for some speakers, perhaps even approaching [ɔ]; but this is by no means a general pattern.
- Even if we consider that stressed vowels and unstressed vowels are separate phonological subsystems in English, it is still interesting that *letter* comes to occupy the phonetic space for [ʌ] - crucially, there is no STRUT/FOOT contrast in Mancunian English.



- 1 Introduction
 - Background
 - Previous Studies
- 2 The Experiment
 - Methodology
- 3 Results
 - *happy*
 - *letter*
 - Discussion
- 4 Conclusion

Discussion

To summarise:

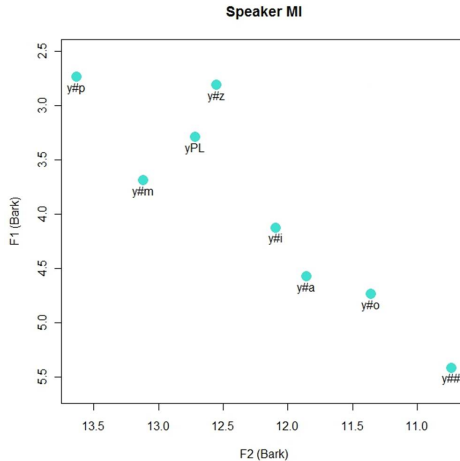
- 1 Phrase-final *happy* is categorically lowered for some speakers of Mancunian English.
- 2 For others, the same pattern occurs, but only **gradiently**; there is also evidence that some speakers are *happy* tensers, not *happy* lowerers.
- 3 Contextual differences between non-phrase-final *happy* realisations are largely non-significant.
- 4 There is strong evidence for consistent backing of phrase-final *letter* for those speakers who also back and lower *happy* in this environment.

This result is very interesting from the perspective of on-going phonological change.

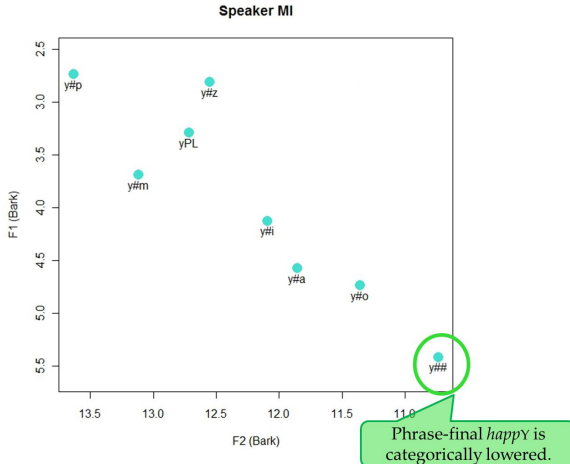
Advanced lowering?

As well as finding evidence that some speakers only use a gradient version of *happy* lowering, a subset of the users display a more advanced pattern.

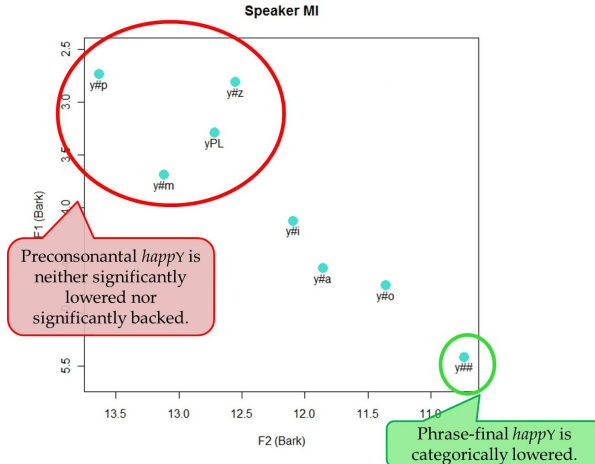
Advanced lowering?



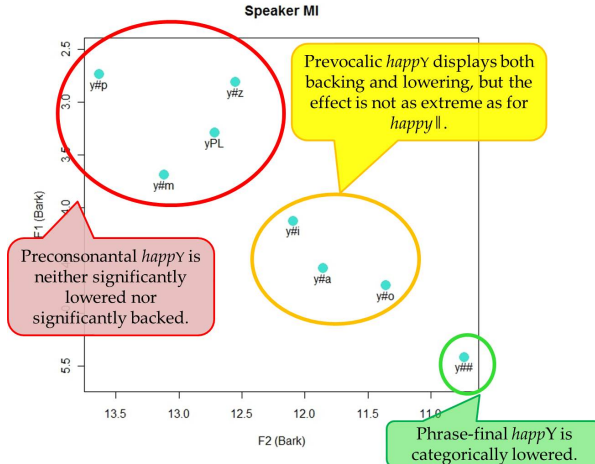
Advanced lowering?



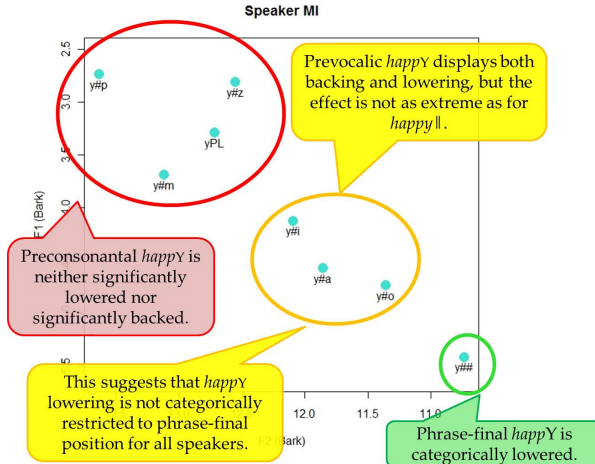
Advanced lowering?



Advanced lowering?



Advanced lowering?



Rule generalisation

- This provokes discussion of an idea which forms part of the life cycle of phonological processes (Bermúdez-Otero, 2007) namely **Rule generalisation**.
- Rule generalisation (Venneman, 1972) occurs when a sound change first applies in a very narrowly defined, phonetically favourable phonological environment, progressively extending to more inclusive phonological contexts over time.

Speaker	<i>-u]</i>	<i>-V</i>	<i>-C</i>
IN	gradient	___	___
GI	categorical	___	___
MI	categorical	gradient	___
<i>Future?</i>	categorical	gradient	?

Future work: Chain shift?

- Another trend that merits further investigation is the emergent pattern of lowering and backing in *letter*.
- Whilst this affects all speakers' phrase-final *letter* vowel (see Cruttenden, 2001:127), many of the categorical *happy* lowering users display more extreme backing of *letter* in phrase-final environments than the *happy* non-users.
- This could be a chain shift in progress, but further investigation is necessary.
 - Does the occurrence of categorical *happy*-lowering in a particular speakers' idiolect predict specific effects for *letter*?

Conclusion

- We've shown that the phrase-final *happy* vowel is significantly lower than traditional [ɪ] for speakers of Mancunian English.
- We've shown that it's on ongoing phonological change:
 - Some speakers show gradient phrase final lowering.
 - Most show categorical phrase final lowering.
 - Some advanced speakers show lowering before vowels.
 - These stages represent evidence of phonologisation and stabilisation.

- Reports that the *letter* vowel is lowering and backing are confirmed somewhat - the backing of the vowel on the F2 dimension is responsible for the change in quality, rather than the lowering.
 - Existing research has yet to determine whether lowering/backing of *happy* interacts with lowering/backing of *letter*.
 - If there is evidence of a chain shift, it will be an exciting find - typically, the literature on chain shifts does not mention stabilisation.
- A topic ripe for sociolinguistic study:
 - Future work will take external factors such as gender and social class into consideration.
 - Dialectal comparisons may show interesting differences.

Acknowledgements

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