Exploring listener sensitivity to the temporal dynamics of back vowel fronting

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Phonetic variation and social perception

- Listeners can interpret small pronunciation differences as socially-meaningful in fairly consistent ways.
- Phonetic variation can be used to form an impression of a speaker's ethnicity (Purnell et al., 1999) social status (Walker et al., 2014), regional identity (Fridland et al., 2004), and sexuality (Munson, 2007), as well as to infer evaluative characteristics such as 'educated' or 'intelligent' (Campbell-Kibler, 2009).
- The consistency of these findings implies that listeners have a shared representation of the social meanings indexed by speech forms – their *indexical field* (Eckert, 2008).
- However, there is also evidence of considerable individual differences in how listeners deal with speech variation, both from a phonetic (e.g. Grosvald, 2009) and sociolinguistic perspective (Campbell-Kibler, 2008; Levon & Fox, 2014).

Research questions:

1. To what extent do the members of a speech community differ in their social interpretation of phonetic variation?
2. How does this variability relate to characteristics of the listener (e.g. age, gender, socioeconomic status, social network characteristics?)

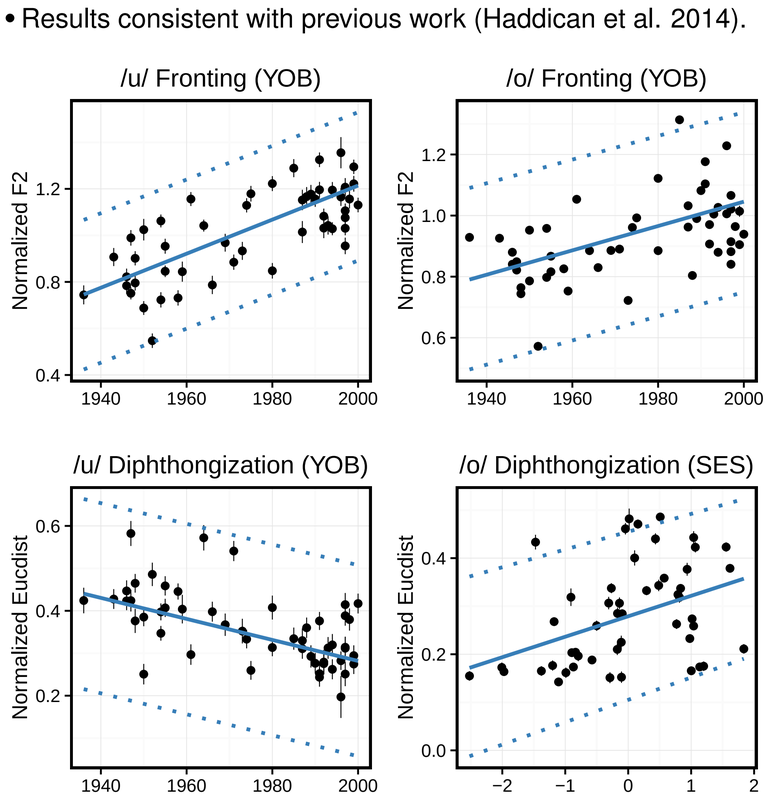
Data

- 52 sociolinguistic interviews conducted in York, northern England.
- Social perception data from the same individuals.

Birth year	Female	Male
1935-1960	7	5
1961-1980	8	11
1981-2000	10	11

/u/ and /o/ fronting in York

- Both /o/ and /u/ are undergoing diachronic fronting in York.
- /u/ is becoming less diphthongal.
- /o/ diphthongization varies as a function of socioeconomic status.
- Results consistent with previous work (Haddican et al. 2014).



Method

- Identify a set of social meanings relevant to this community through ethnographic interviews and an open-ended speech evaluation task.
- Measure listeners' ability to match these meanings to variation in the target vowels through a perception experiment.

Figure 1: /u/ variants tested (too/food)

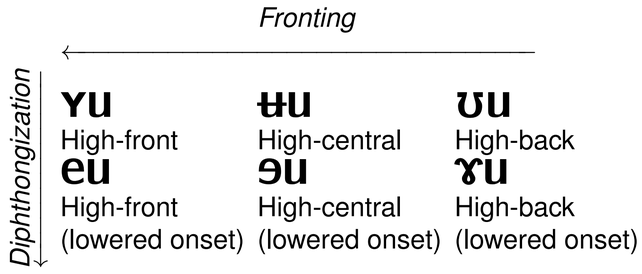


Figure 2: /o/ variants tested (toast/so)

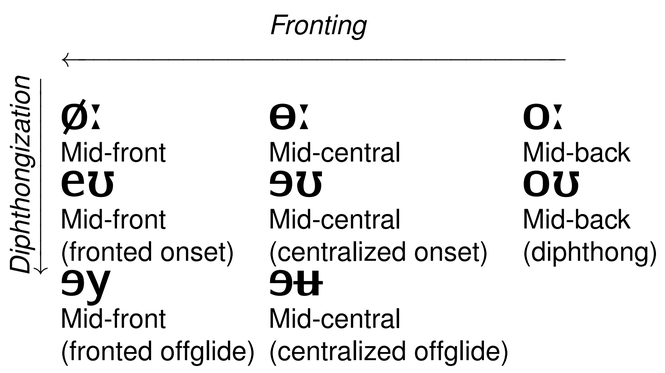
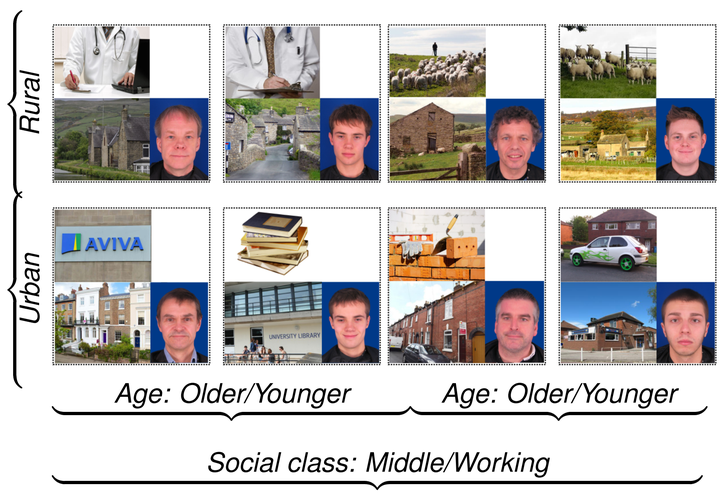


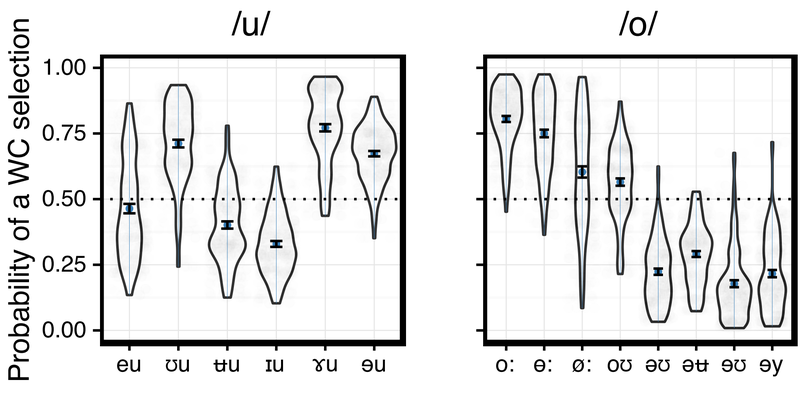
Figure 3: Visual stimuli



- **Task:**
  - Participants are told they are listening to an actor pretending to be one of a set of characters in a TV sitcom set in York.
  - **Training phase:** Participants sort the images according to questions e.g. 'Which character comes from Rural Yorkshire'?
  - **Testing phase:** Participants see the characters in 'minimal pairs', hear a speech token, and select the character which they think the actor is pretending to be.
- **Analysis:**
  - Responses analyzed using mixed GLMs with a logit link.
  - Models predict the selection of a WC vs MC image as a function of vowel variant heard.
  - Individual-level variability modelled through uncorrelated random slopes (variant|listener) and random intercepts (listener and item).

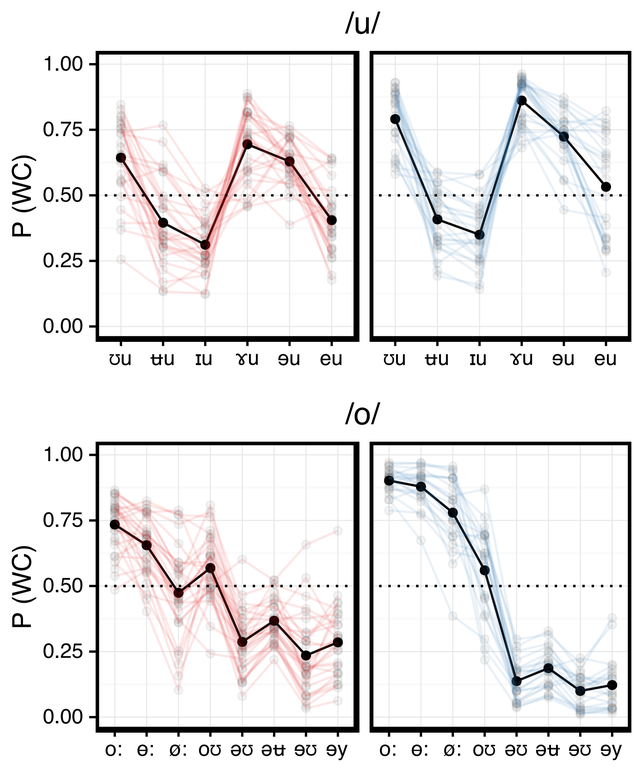
Results

Main effects for MC/WC selections:



- Listeners perceive back /u/ variants as more 'working-class' than fronted variants.
- Additionally, there is a weak effect of /u/ diphthongization, with diphthongal variants heard as more 'working-class' than monophthongs.
- Monophthongal /o/ variants cue 'working-class' selections.
- Diphthongal /o/ variants cue 'middle-class' selections, with the exception of the back dipthongal variant [oʊ].
- There is a small effect of fronting within monophthongs – more fronted variants sound *less* 'working-class'.

How consistent are listeners' intuitions?

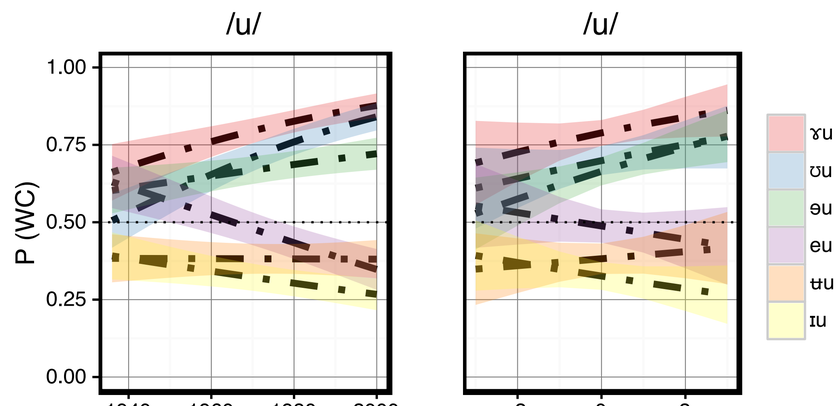


- Responses are similar in directionality, but individuals vary:
  - in how much they deviate from chance selections.
  - in terms of which variants they are most sensitive to.
- k-means clustering reveals at least two perceptual profiles for each vowel:
  - For /u/, some listeners are more sensitive to fronting than others (right panel vs left panel).
  - /o/ also shows qualitative differences – some listeners hear [øː] as relatively unmarked with regard to the MC/WC dimension, while others hear it as more 'working-class' (left panel vs right panel).

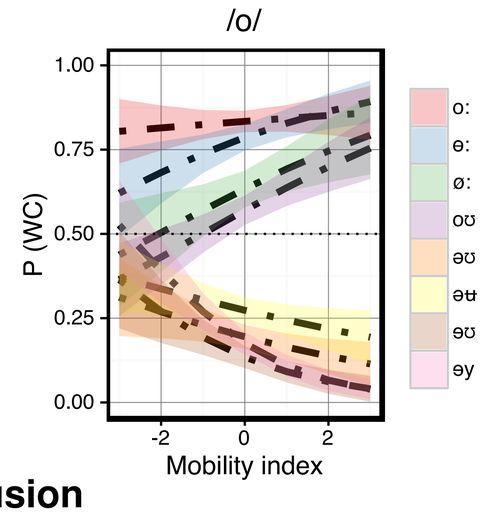
How does this variability relate to social characteristics of the listener?

- Variables tested: Listener gender (M/F); Listener year of birth (1935-2000); Local identity index (-3 +3); Mobility index (-3 +3)

/u/: Younger, more mobile listeners are more sensitive to fronting as an index of social class than older, less mobile listeners.



/o/: More mobile listeners are more sensitive to diphthongization as an index of social class than less mobile listeners.



Conclusion

1. When interpreting phonetic variation socially, individuals vary:
   - ...quite a lot in terms of the strength/consistency of their evaluations
   - ...a little in terms of which acoustic dimensions they attend to
   - ...very little in the directionality of their evaluations.
2. This variability is related to characteristics of the listener:
   - Younger, more mobile listeners are more sensitive to /u/ variation as an index of social class than older, less mobile listeners.
   - Controlling for age, more mobile listeners are more sensitive to /o/ diphthongization as an index of social class than less mobile listeners.

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