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The phonetic and social correlates of non-rhoticity and derhoticised /r/ in Edinburgh English

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Introduction

- Rhoticity & social class in Scotland
  - Approximants in Middle Class speech
  - Derhotics and/or pharyngealized vowels in Working Class speech (Speitel & Johnston 1988)
- Urban, Central Belt varieties
  - Edinburgh (e.g., Romaine 1978; Lawson et al. 2008, at sqz; Scobbie et al. 2008, 2013; Schützler 2010, at sqz.)
  - Glasgow (e.g., Macafee 1981; Stewart-Smith 1999-3, at sqz.)
- Seven-step rhoticity continuum (Lawson et al. 2014)
  - from deletion, to derhotisation, alveolar/retroflex approximant, schwa, tap, and trill.
- The Problem...
  - The non-rhotic and derhotic variants are acoustically similar but maximally distinct socially, used by Middle Class women and Working Class men, respectively.
  - Auditory distinguishing non-rhotic and derhotic variants is notoriously difficult, even for phonetically trained native speakers (cf. Stuart-Smith et al. 2014).

Research Question

Lawson et al. (2014) showed articulatory differences between the non-rhotic and derhotic forms.

- Are these variants acoustically distinct? What are the cues?
- Is their social indexicality signalled more (or instead) by the quality of the preceding vowel than the quality of the rhotic?

Procedure

We examine two of the several acoustic measures of derhotic h/r described by Stuart-Smith et al. (2014).

1. For all non-rhotic or derhotic tokens, code for any ‘breathy period’ (Lawson et al. 2008) or ‘audible frication’ (Stuart-Smith et al. 2014) at the vowel offset, said to characterise derhotisation.
   - Presence vs. absence
   - If present, then duration
2. Measure the F1 & F2 of the midpoint of the preceding vowel for the subset of tokens belonging to the START lexical set.
   - Lexical items correspond to Wells’ (1982) lexical sets.
   - Any historical overlap with the NMC/SQUARE set in Scottish speech (e.g. Zai 1942) is not apparent in the present data set.

Data

Spontaneous speech, 7 M, 6 W, ages 57-69, 2* SEC groups:
- WC School-leavers from age 16 or younger; worked in blue-collar jobs; parents in similar jobs
- EMC University graduates; attended private schools; worked in white-collar jobs; parents in similar jobs

*Third, upwardly mobile SEC groups. NMC-first in family to go to university or to have a white-collar job. NMC speakers show a high rate of approximant use and were excluded from this analysis due to scarcity of non-rhoticity/derhoticisation (Dickson & Hall-Lew 2015).

- Six 1-hour sessions, Nov 2013 to Jan 2014
- Same-sex, same-SEC groups of 2-3 speakers each
- Sessions led by the first author (F, EMC, Edinburgh)
- Speech prompted by a written list of topics: childhood, education, family, work, life in Edinburgh
- Interpersonal dynamics were impressionistically consistent across groups; friendly, casual and interactive.

Results: Frication

- N=135 utterance-final tokens coded as either non-rhotic or derhotic: 53% realised with frication
- Huge skew in class/gender representation in the data (Fig. 3) (Because approximation variants are favoured by all groups except the Working Class men.)

Results: Presence vs. Absence

- Presence of frication favoured statistically by WC speakers (imer, Figure 2)
- Low Hs precluded testing a GENDER x CLASS interaction effect (but see Figure 3)

Results: Duration (when present)

- Duration of frication is also longest for WC speakers, but individually variable.

Frication as a distinguishing cue? Well...

- The derhotic breathy period is only discernible for utterance-final tokens.
- Duration measurements are highly variable (affected by, e.g., microphone distance), and so might be problematic for some field-based recordings.

Results: Vowel Quality

- A small subset of a small subset: N=79 utterance-final START tokens coded as non-rhotic or derhotic.
- Proceed with caution!

Group differences in vowel quality?

- Orthogonal to rhoticity results.

Results:

- F1: Men favour higher vowels than women. Within gender, EMC are higher than WC.
- F2: EMC women & WC men favour backer variants. WC women are strikingly fronted.

Discussion & Future Directions

While it is in some cases possible to take frication as a cue to distinguish non-rhotic and derhotic variants, frication is only a useful cue in utterance-final contexts. The quality of the preceding vowel might give further cues to social indexicality, but the vowel quality varies independently of the quality of the rhotic and is not a useful cue for distinguishing non-rhoticity from derhoticisation. Future analysis will consider all the rhotic lexical sets and normalise the formant data for gender.

References available upon request.