Spectral and lingual correlates of /r/ in East Thuringia
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Pharyngealization

Narrowing of pharyngeal passage → auditorily dark quality of the segment (Laver 1994)

- Studied extensively on varieties of Arabic (e.g. Almbark 2009, Jongman et al. 2011)
- In East central German varieties (Saxon, Khan/Weise 2013) but also in a south western variety (Swabian, Hiller 1995) vocalic correlates of coda /r/ are auditorily characterized by pharyngealization of the preceding vowel, but also of adjacent consonantal material.
- Acoustic and articulatory studies are scarce (Grawunder 2006)

Data collection

Articulatory analysis

- 3 measurements during VC sequence: two points during the vowel and one point 10 ms after start of consonant
- fitted splines of second time point averaged for each speaker and each vowel
- Mean and standard deviation for each speaker and vowel over 5 repetitions

Acoustic analysis

- /r/-vowels are further back and lower
- Differences vary between the vowel pairs
- Flatter tongue contour, which is more retracted and raised towards the back in the /r/-condition
- No difference in Pack/Park, since /a/ is already realized with a retracted tongue root
- RG realizes a considerably retracted tongue position for the /r/-condition in all vowel pairs

Pharyngealization in East Thuringia

- articulatory correlates: tongue retraction & raising
- acoustic correlates: lower F2, higher F1 tempo extension on adjacent consonants
- more speaker groups (gender, age, ...)
- articulatory & acoustic analysis for all time points

Speakers:
- 7 male speakers (26-28 years)
- from south of Saxony-Anhalt, East Thuringian dialect (born, raised, still place of residence)
- personally known by first author (informal situation during recording)

Speech material:
- 5 minimal pairs differing in presence or absence of coda /r/
- embedded in short vowel contexts, 5 repetitions per token & speaker

Articulatory analysis

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Fitted splines of second time point

Mean = thick lines
SD = thin lines

Pharyngealization

- Derhotacized and pharyngealized /r/-variants described for Scottish English using Ultrasound Tongue Imaging (Lawson et al. 2013)
- UTI cannot show actions of the pharyngeal wall but retraction of tongue root

LMM with F1 or F2 as DV
- Significant interaction of /r/-condition*vowel
- No difference in F1 for /a/-/ar/ → no tongue retraction
- Lower F2 values in /r/-condition for all vowels
- Difference in lip rounding for /a/-/ar/ → lower F2

Temporal extent during P/e/-/la/
- F1 and F2 at 4 time points throughout /ε(r)la/: early and late in the vowel, middle of the lateral and schwa

- F1 and F2 estimated at approximate time point of articulatory measurements → Enlargement of the oral cavity lowers F2 while smaller pharyngeal cavity raises F1 (Stevens 1998)
- 10 measurements over time course of /ε(r)l/ (10 ms after vowel start)
- Mean and standard deviation for each speaker and vowel over 5 repetitions

What’s next?
- more speaker groups (gender, age, ...)
- articulatory & acoustic analysis for all time points