Microvariation in laryngeal realism

Preaspiration in North Germanic

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Preview

• Preaspiration in North Germanic: the traditional view
• Variation within Scandinavia: more than meets the eye?
• The phonology of preaspiration: nice and boring
• Phonological representations aren’t the place to reflect phonetic variability

1 Preaspiration in North Germanic

1.1 Background

Stressed syllables in North Germanic

• Strict bimoracity in stressed syllables (Riad 1992, Kristoffersen 2011) modulo extrametricality
  – Old Norse taka [(ta)ka] ‘take’: not allowed in most varieties
  – Norwegian taket [(tɑː)kə] ‘the roof’
  – Norwegian takke [(tɑk)kə] ‘to thank’
  – Norwegian *[tɑːkːə]

Laryngeal contrast

• ‘Fortis’ [p t k] vs. ‘lenis’ [b d ɡ]
- Fortis: aspiration foot-initially
- Lenis: various realizations
  - Full prevoicing: Central Standard Swedish (Pétur Helgason & Ringen 2008)
  - Complete devoicing: Danish (Hutters 1985), Icelandic (Magnús Pétursson 1976)
  - Partial voicing: Norwegian varieties (e.g. Halvorsen 1992)
- No restriction on quantity: both fortes and lenes can be geminate

Norwegian *lapp* 'sheet' vs. *labb* 'paw'

**Preaspiration: the traditional view**

- Rare cross-linguistically (Silverman 2003)
- Though perhaps more stable once it does appear (Clayton 2010)
- In North Germanic: particularly geminate fortes in stressed syllables (Pétur Helgason 2002, Johnsen 2007)
- Icelandic and Faroese: known to 19th century scholars (Sweet 1877, Jakobsen 1886)
- Norwegian: (some) traditional dialect descriptions

**Preaspiration in Norwegian**

- North Gudbrandsdalen, inland south (e.g. Ross 1907)
- Senja, north (Iversen 1913)
- Rogaland, south-west (Oftedal 1947, Wolter 1965)
- Lofoten, north (Elstad 1982)

**1.2 The status of preaspiration**

*‘Normative’ vs. ‘non-normative’ status*

**Pétur Helgason (2002: 21)**

If the absence (or presence) of a particular phonetic trait leads to a pronunciation that is considered deviant by the speakers of a given dialect, that trait can be classified as normative (or normatively absent) in that dialect. Conversely, a trait whose absence or presence does not lead to deviant pronunciation can be classified as non-normative in that dialect.

- This is a sociolinguistic definition
The phonological status of preaspiration

- What are the system-internal consequences?
- Normative preaspiration is obligatory: but is it phonological?
  - Icelandic: yes, driven by synchronic considerations of weight
  - Faroese: perhaps, driven by synchronic considerations of weight and vowel height
- What is the phonological status of non-normative preaspiration?

Parameters of variation

- Normative preaspiration
  - Difference in patterning after long vowels (*harðmæli* vs. *linmæli* Icelandic)
- Non-normative preaspiration
  - Presence of preaspiration controlled by preceding vowel height (reported for Faroese)
  - Presence of oral frication (Faroese)
  - Difference in patterning depending on vowel length
- Relationship between preaspiration and sonorant devoicing (Pétur Helgason 2002)?

2 Looking for preaspiration

2.1 Sources of evidence

Traditional descriptions: how reliable?

- Oftedal (1947): Gjesdal Norwegian has preaspiration in words like *katt* 'cat', *katta* 'the cat', but Dalane Norwegian has postaspiration in these contexts
- Tengesdal (2015): instrumental study of Dalane, preaspiration is pervasive
- Allen (2016): instrumental study reports preaspiration in Oslo

Corpus evidence

- Numerous examples in the Nordic dialect corpus (Johannessen et al. 2009)

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1Interestingly, the very same Oftedal (1956) accurately reports the presence of preaspiration in the Scottish Gaelic of Lewis.
Interim conclusion

- Mounting evidence that reports of the absence of preaspiration might not be reliable
- Pétur Helgason (2002: 207): ‘[T]he tendency to preaspirate, although it is not normative, permeates Scandinavian stop production.’

2.2 Current study

Motivation

- Main interest: variation across ‘dialects’
- Previous comparative work has mostly focused on duration (Wretling, Strangert & Schaeffler 2002, Tronnier 2002, van Dommelen, Holm & Koreman 2011)
- Pétur Helgason (2002): more information on other factors (distribution, interaction with sonorant devoicing)

Study

- Western Norway (southern Rogaland): widely regarded as a ‘preaspirating’ region
- Northern Norway (variety of regions): few if any reliable reports
- Word list: real words
  - Short vs. long vowels
  - Fortis vs. lenis stops, [s] for control
  - Labials vs. coronals vs. dorsals
  - Mono- vs. disyllables
  - Also: lC, NC, rC clusters with different C laryngeal specification
- Mostly balanced, though some conditions less available
  - [b d g] after long vowels
  - [b d g] after nasals
Incidence of preaspiration

Figure 2: Voiceless preaspiration of stops by dialect and consonant length

- A *lot* of preaspiration, particularly with geminates (short vowels): expected
- Significant amounts of preaspiration after long vowels, albeit less than after short ones
  - In line with tendencies elsewhere
  - Still perhaps surprisingly frequent

These numbers understate the occurrence of ‘preaspiration’ compared to previous literature, because they exclude breathy voice

Normative preaspiration in Norwegian?

- Some northern speakers show (near-)normative preaspiration of geminates, similar to the western ones

How many systems?

- Can we quantify the amount of variation between speakers/varieties?
- One way: *clustering*
- Fit a model that treats all effects as per-speaker uncorrelated random slopes: estimate of differences among speakers
• Here: model the occurrence of (voiceless) preaspiration in stops

```r
fit <- glmer(p ~ 0 + (fortis + v_is_long + v - 1 | speaker),
             data = stops,
             family = binomial(link=logit))
```

• Now take the random effects and run a clustering procedure
• Here: $k$-means clustering, best number of clusters is 5 by the ‘elbow method’

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Cluster</th>
<th>Place of origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>NF1</td>
<td>1</td>
<td>Nordreisa</td>
</tr>
<tr>
<td>NF6</td>
<td>1</td>
<td>Øksnes</td>
</tr>
<tr>
<td>VF1</td>
<td>1</td>
<td>Stavanger</td>
</tr>
<tr>
<td>VF2</td>
<td>1</td>
<td>Bryne</td>
</tr>
<tr>
<td>VF3</td>
<td>1</td>
<td>Finnøy</td>
</tr>
<tr>
<td>VM1</td>
<td>1</td>
<td>Stavanger</td>
</tr>
<tr>
<td>NF2</td>
<td>2</td>
<td>Alta</td>
</tr>
<tr>
<td>NF7</td>
<td>2</td>
<td>Alta</td>
</tr>
<tr>
<td>NF4</td>
<td>3</td>
<td>Melbu</td>
</tr>
<tr>
<td>NF5</td>
<td>3</td>
<td>Stokmarknes</td>
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<tr>
<td>VM2</td>
<td>4</td>
<td>Kvitseøy</td>
</tr>
<tr>
<td>VM3</td>
<td>4</td>
<td>Stavanger</td>
</tr>
<tr>
<td>NF3</td>
<td>5</td>
<td>Sørreisa</td>
</tr>
</tbody>
</table>

Table 1: Clustering of speakers by random effects
• The ordering of the clusters is random, but some patterns seem to emerge
• Cluster 1 is the speakers who basically always preaspirate
• Some other clusters make geographical sense
  – Cluster 2 has the two speakers from Alta in Finnmark
  – Cluster 3 has the two speakers from southern Vesterålen (Hadseløya)
• Some confidence in the method?

Interim conclusion

• Preaspiration is pervasive both in western varieties (expected) and at least some northern ones (less expected)
• Some variation across speakers at a fairly finely grained level, though probably not just individual differences
• The grammatical status of this variation is less immediately clear

3 The phonology of preaspiration

3.1 Preliminary analysis

Laryngeal realism?
• Laryngeal realism (Honeybone 2005 and much other work): Norwegian obstruents are [fortis] [p t k] vs. [ʔ] [b d ɡ]

• Sources of evidence:

Phonological evidence

• Norwegian is a fairly typical [H] language
• ‘Germanic’ pattern of obstruent assimilation (Salmons forthcoming)

Kristoffersen (2000: 84) on (Eastern) Norwegian
If degree of ‘activity’ is measured in a feature’s ability to cause changes in a given structure, either by forcing incompatible features to delink or by spreading, there can be no doubt that [asp]… comes out as more active compared with [voice].

• Crucial pattern of the weak verbs’ past tense suffix:
  – Quite involved in Eastern Norwegian
  – More like classic [H] activity pattern in Western Norwegian (Venås 1974, Skjekkeland 2005)

Laryngeal realism and lenis stops

• If lenis stops are [ʔ], how are they realized phonetically?
  – Passive voicing: German, English
  – Variable but frequent voicing: some Norwegian varieties
  – Categorical voicing: Central Standard Swedish
  – Categorical voicelessness: Icelandic, Danish, Scottish Gaelic

Western Norwegian lenis stops

• Previously described as having categorically voiceless lenis stops (Marstrander 1932, Tengesdal 2015)
• Current data essentially agrees: very few lenis stops with any voicing

2 At least some varieties some of the time.
3.2 Sonorant devoicing in Western Norwegian

Sonorant devoicing

- All the western speakers in the study have the uvular [ʁ]/[χ] as the categorical or overwhelming majority realization of the rhotic
- Current data:
  - Categorical assimilation of [ʁ]
  - Variable assimilation of [l m n]

Summary

- Fortis stops behave as expected: triggers of categorical devoicing of [ʁ]
- Fortis stops: likely triggers of gradient devoicing of [l m n]
- Lenis stops do neither, even though they are categorically voiceless

Analysis

- [fortis] stops [p t k] trigger a phonological assimilation process in rhotics
- Gradient coarticulation can cause some devoicing of laterals and nasals before [fortis] [p t k], in parallel with preaspiration
- [∅] stops [b d ɡ] cannot trigger assimilation of rhotics for lack of a feature
- [∅] stops [b d ɡ] do not cause gradient devoicing, either
- However, [b d ɡ] must be articulated with glottal spreading to inhibit voicing
3.3 Formalizing the analysis

Analysis of Norwegian in laryngeal realism, revisited

- Phonological criteria: unproblematic |H| vs. |∅|
- Phonetic criteria: what is the specification of lenis stops?
- Beckman, Jessen & Ringen (2013): cross-linguistic differences among lenis stops are captured via a specification of [αs.g.], α ∈ [1...n]
- With a large enough α, lenis stops are not voiced

Phonetic variation is irrelevant

- Rogaland Norwegian lenis stops are voiceless, but show no phonetic or phonological evidence of being [spread glottis]
- Not clear how the [αs.g.] model can capture the finely grained community-level differences in the behaviour of fortis or lenis stops
- Not clear whether this is desirable: these finely grained differences appear irrelevant for categorical phonological behaviour
Conclusion: a substance-free framework

- Laryngeal realism is right on the basic asymmetry in phonological behaviour: marked [fortis] vs. unmarked [∅]
- Laryngeal realism may not have the tools to capture finely grained phonetic detail
- This is because the detail is irrelevant (Salmons forthcoming)
- Substance-free approach
  - Featural specification captures asymmetries in phonological behaviour
  - The precise realization is variable and conventional (Iosad 2017)
  - Phonological criteria > phonetic criteria

Summary

- Preaspiration is attested (even) more widely than often assumed
- Lack of reports, especially in traditional descriptions, should not be taken to mean preaspiration is absent
- There is lots of attention-worthy variation across dialects
- This picture is most consistent with a substance-free approach to featural specification

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References


