

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 bimoraicity in stressed syllables (Riad 1992, Kristoffersen 2011) *modulo* extrametricality
 - Old Norse *taka* [(ta)ka] 'take': not allowed in most varieties
 - Norwegian *taket* [(ta:)kə] 'the roof'
 - Norwegian *takke* [(tak)kə] 'to thank'
 - Norwegian *[ta:kə]

Laryngeal contrast

- 'Fortis' [p t k] vs. 'lenis' [b d g]

- 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 (Ofstedal 1947, Wolter 1965)
- Lofoten, north (Elstad 1982)
- Trøndelag, centre (Moxness 1997, van Dommelen 1998, Ringen & van Dommelen 2013)

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 pervasive¹
- Allen (2016): instrumental study reports preaspiration in Oslo

Corpus evidence

- Published evidence for preaspiration in Swedish dialect corpora: Wretling, Strangert & Schaeffler (2002), Tronnier (2002), Pétur Helgason (2002)
- Numerous examples in the Nordic dialect corpus (Johannessen et al. 2009)

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

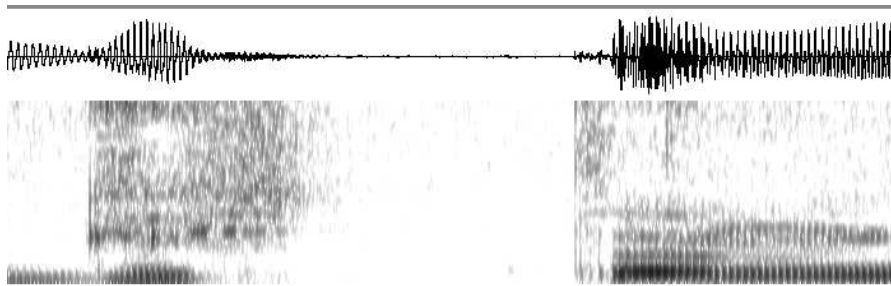


Figure 1: Evje, Setesdal, Aust-Agder fylke: [gʊʰt:an] ‘the boys’

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: IC, 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

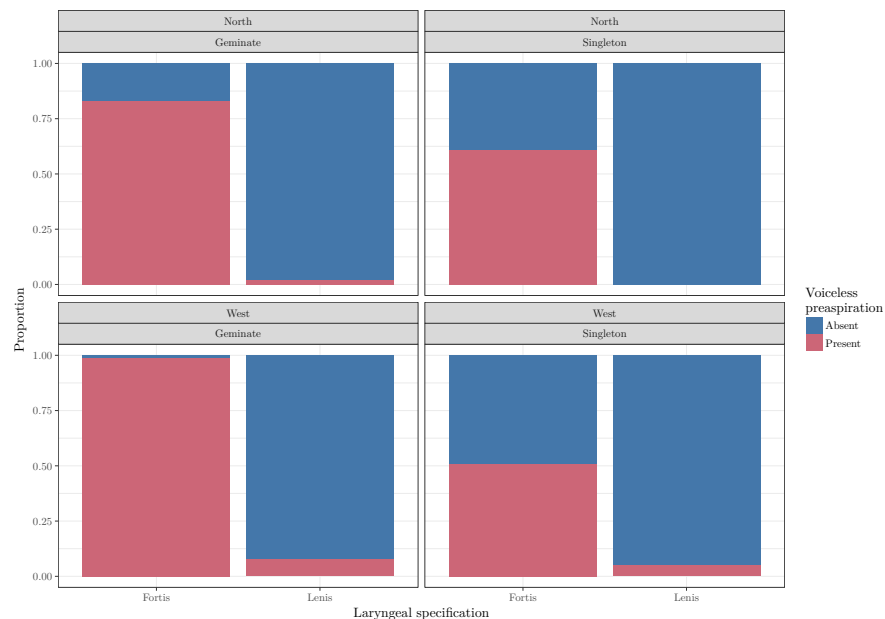


Figure 2: Voiceless preaspiration of stops by dialect and consonant length

- 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

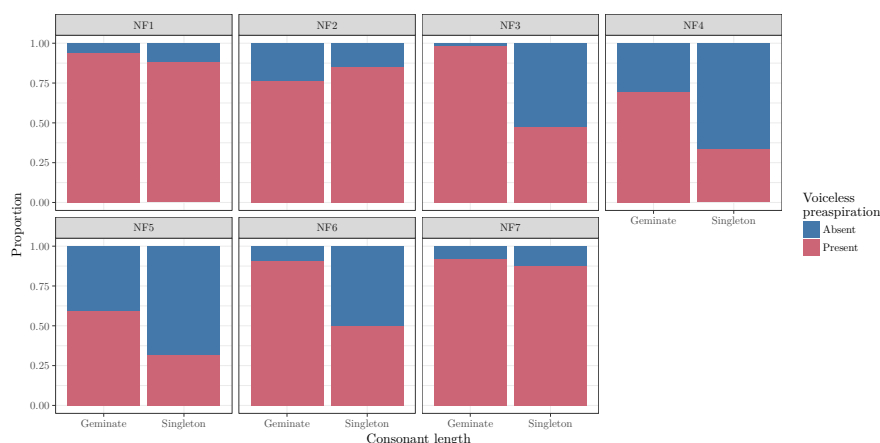


Figure 3: Preaspiration of fortis for northern speakers, by consonant length

- Here: model the *occurrence* of (voiceless) preaspiration in stops

```
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’

Speaker	Cluster	Place of origin
NF1	1	Nordreisa
NF6	1	Øksnes
VF1	1	Stavanger
VF2	1	Bryne
VF3	1	Finnøy
VM1	1	Stavanger
NF2	2	Alta
NF7	2	Alta
NF4	3	Melbu
NF5	3	Stokmarknes
VM2	4	Kvitsøy
VM3	4	Stavanger
NF3	5	Sørreisa

Table 1: Clustering of speakers by random effects

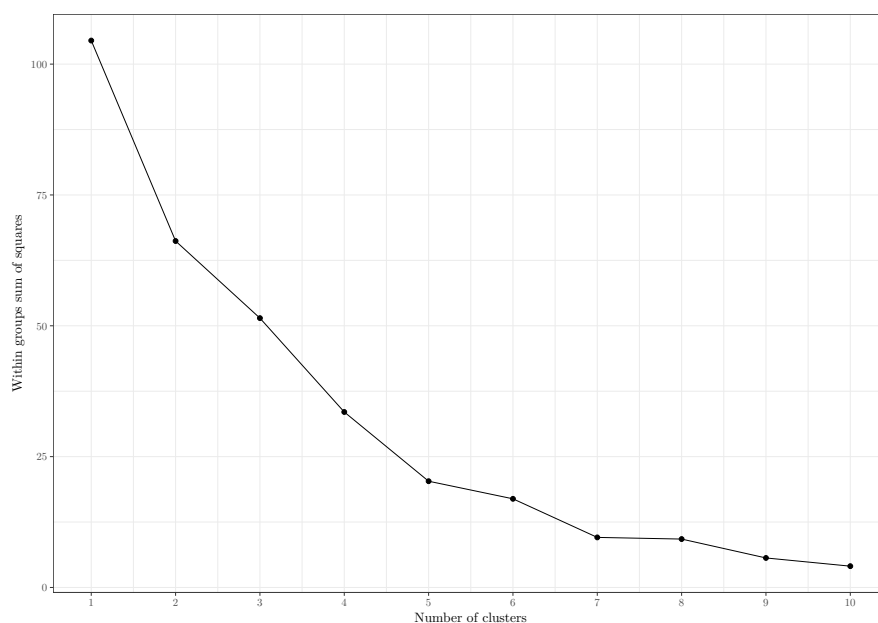


Figure 4: Within group sum of squares, by number of clusters

- 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. [Ø] [b d g]
- Sources of evidence:
 - Phonological behaviour (Iverson & Salmons 1995, 2003, Spaargaren 2009)
 - Phonetic categoricity (Jessen & Ringen 2002, Ringen & Pétur Helgason 2004, Pétur Helgason & Ringen 2008, Beckman et al. 2011, Beckman, Jessen & Ringen 2013)

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 [Ø], how are they realized phonetically?
 - Passive voicing: German, English²
 - 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

²At least some varieties some of the time.

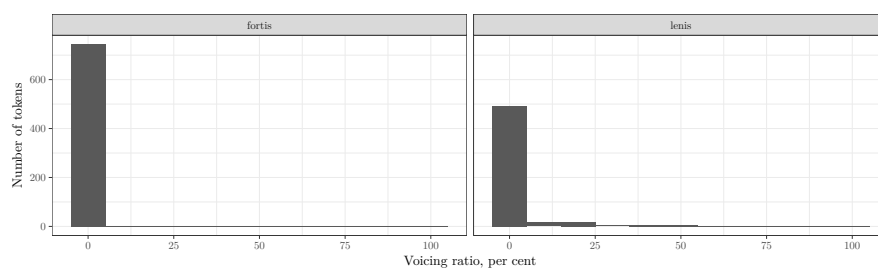


Figure 5: Distribution of voicing ratio in stops, western speakers

3.2 Sonorant devoicing in Western Norwegian

Sonorant devoicing

- All the western speakers in the study have the uvular [ɣ]/[χ] as the categorical or overwhelming majority realization of the rhotic
- Gunnar Ólafur Hansson (2001), Pétur Helgason (2002): normative preaspiration associated with categorical voicelessness in [r]-stop and [lt] clusters
- Current data:
 - Categorical assimilation of [ɣ]
 - Variable assimilation of [l m n]

Summary

- Fortis stops behave as expected: triggers of categorical devoicing of [ɣ]
- 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 g] cannot trigger assimilation of rhotics for lack of a feature
- |∅| stops [b d g] do not cause gradient devoicing, either
- However, [b d g] must be articulated with glottal spreading to inhibit voicing

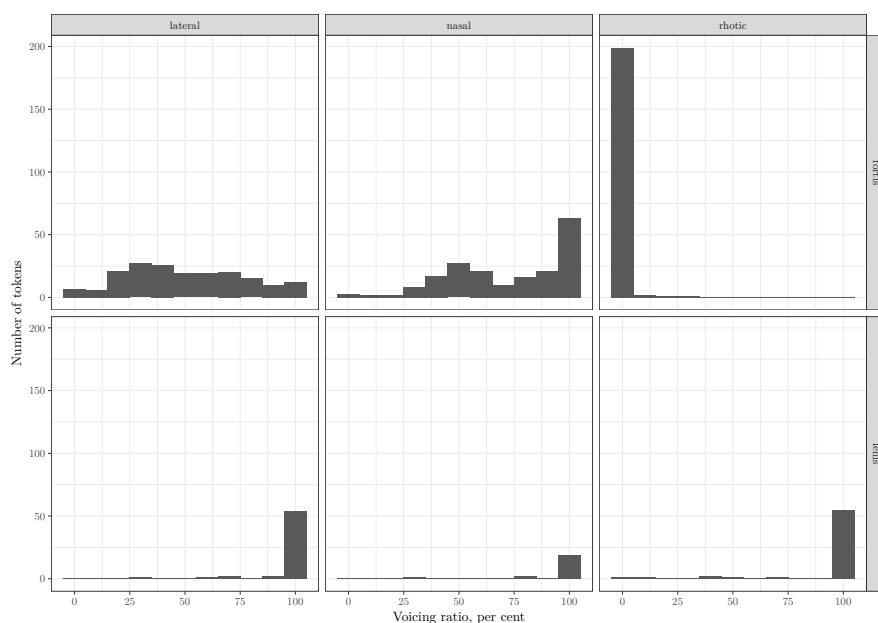


Figure 6: Distribution of voicing ratio in sonorants, by manner and laryngeal specification of following stop, western speakers

3.3 Formalizing the analysis

Analysis of Norwegian in laryngeal realism, revisited

- Phonological criteria: unproblematic $|H|$ vs. $|\emptyset|$
- 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 $[\alpha.s.g.]$, $\alpha \in [1 \dots n]$
- 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 $|\text{spread glottis}|$
- Not clear how the $[\alpha.s.g.]$ 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
- Phonetic realization is *conventional* (cf. Docherty 1992, Carr 2000, Scobbie 2006)

Conclusion: a substance-free framework

- Laryngeal realism is right on the basic asymmetry in phonological behaviour: marked |fortis| vs. unmarked |θ|
- 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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