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Preaspiration in North Argyll Gaelic and its contribution to prosodic structure

Pavel Iosad
pavel.iosad@ed.ac.uk

Michael Ramsammy
m.ramsammy@ed.ac.uk

Patrick Honeybone
patrick.honeybone@ed.ac.uk

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Outline of argument

- North Argyll & mainland preaspiration with [xp xt xk] is a real phenomenon
- North Argyll preaspiration allows us to establish neutralization of laryngeal contrast after a long vowel
- Preaspiration in Argyll varieties counts as a weight-bearing coda segment
- Phonological diversity within Gaelic may point to internal dynamics

1 North Argyll preaspiration

1.1 Preaspiration in Gaelic: basic facts

Laryngeal contrast in Gaelic

- Laryngeal contrasts in Gaelic (Ladefoged et al. 1998, Clayton 2010, Nance & Stuart-Smith 2013)
- ‘Fortis’ vs. ‘lenis’
  - Prevocalic: [pʰ tʰ kʰ] vs. [p t k]
  - Postvocalic after a short vowel: [ʰpʰ tʰ kʰ] vs. [p t k]
  - Postvocalic after a long vowel: [ʰpʰ tʰ kʰ] vs. [p t k], but with shorter preaspiration compared to short vowel context
Dialect variation

- ‘Preaspiration’ [ʰpʰtʰk]: Lewis, mainland Ross-shire
- Partial ‘preaffrication’ [hp ht xk]: Outer Hebrides except Lewis, Skye, Islay, mainland Inverness-shire
- Across-the-board ‘preaffrication’/buccalization [xp xt xk]: N Argyll, Lochaber, W Perthshire, Banffshire

Available evidence

- Traditional descriptions
- SGDS
- More recently instrumental studies (Ní Chasaide 1986, Ladefoged et al. 1998, Clayton 2010, Nance & Stuart-Smith 2013), but these focus on Western Isles/Skye
- Obligatory buccalization is typologically rare (Silverman 2003, Clayton 2010) and may involve homorganic fricatives: Fox [fp st çć]
- Homorganic fricatives occasionally attested in descriptions, including SGDS: tapaidh [tʰaɸpɪ]

1.2 Acoustic study

Our study

- Acoustic study of preaspiration in North Argyll Gaelic
- 4 speakers Isle of Lismore, 4 speakers Sunart (Strontian)
- Fortis and lenis stops
  - Palatalization of stop
  - Preceding vowel quality
  - Vowel length
  - Also after liquids
- Also stimuli with underlying coda [x] (e.g. each, loch)
- Attempted to find unambiguous (heteromorphemic) clusters, but these are rare

Aims of study

- Verify the descriptions: is there oral frication? Is it dorsal or homorganic with following stop?
- Palatalization of the preaspiration: does it match the palatalization of the stop or the front-ness of the vowel? Or both/neither?
- What is the realization of preaspiration after a long vowel in these dialects?
Results at a glance

- Data analysis is ongoing
- Nature of frication: verified
  - Robustly dorsal frication across all places of stop
  - Velar or uvular
  - Intra-speaker variation in intensity (not understood yet)
- Preaspiration after long vowel: two possible outcomes
  - ‘Deaspiration’
  - Relexification with underlying fricative

2 Study results

2.1 Nature of frication

Velars

\textit{poca} ‘pocket’

\begin{figure}
\centering
\includegraphics[width=\textwidth]{poca_L4M}
\end{figure}

Coronals

\textit{putan} ‘button’

\begin{figure}
\centering
\includegraphics[width=\textwidth]{putan}
\end{figure}
2.2 Preaspiration after long vowels

Existing descriptions
Descriptions agree that preaspiration is appreciably shorter after long vowels and may even be absent (‘deaspiration’)

However, descriptions (of other dialects) also agree that fortis stops in this position are (pre)aspirated, if perhaps in a variable manner

Facilitated by the fact that (in relevant dialects) preaspiration after both short and long vowels is realized as glottal friction

This is not the case for /xp xt xk/ dialects
- Oral frication after short vowels
- After long vowels (SGDS data): deaspiration (s. v. bàta, mo bhàta, pàpa) or robust frication (s.v ràcan)

The crucial point
In /xp xt xk/ varieties, glottal friction before a stop does not have to indicate preaspiration

Results

- Broadly agree with SGDS: often no oral frication after a long vowel
  - bàta ‘boat’

![Waveform and spectrum of bàta](image)

3 The phonology of preaspiration

3.1 Preaspiration and foot structure

The proposal
‘Deaspiration’ of fortis stops after a long vowel represents an instance of weakly unconditioned deletion of |spread glottis|: lenition (Honeybone 2012)

• The feature |spread glottis| in stops is licensed by the foot

\[\text{Corollary: preaspiration in North Argyll Gaelic contributes a mora}\]

\[\text{Corollary: if this analysis extends to other varieties, ‘weaker’ preaspiration in a Vː_C context is not the same phenomenon as in V_C}\]

### Some assumptions

• Fortis stops in Gaelic are marked relative to lenis stops: we formalize this with a unary feature |spread glottis|

• Phonological processes can be ‘conditioned’ (triggered by their context) and ‘unconditioned’ (not triggered by a particular property of the context)

• Weakly unconditioned processes can be inhibited: this is lenition (Honeybone 2005, 2012)
  
  Prosodic inhibition: position within the suprasegmental structure
  Melodic inhibition: properties of other segments (e.g. geminate inalterability)

• Both kinds of inhibition found in Gaelic

### Prosodic inhibition

• Contrast between |spread glottis| and \(\emptyset\) stops

• Intact foot-initially: \(\text{[tʰəv] tàbh vs. [tav] damh}\)

• Intact after a short vowel: \(\text{[paʰtə] bata vs. [fata] fada}\)

• Our claim: neutralized to \(\emptyset\) after a long vowel: \(\text{[paːtə] bàta (\text{[paːʰtə]} = [lˠuːtak] lùdag ‘little finger’}\)

• Cf. Jones 2010 for a similar description

• Lenition: deletion of |spread glottis| because |spread glottis| is only licensed within the head foot

### Prosodic inhibition

(1) Foot structure of bàta

\[
\begin{array}{c}
\text{Ft} \\
\sigma & \sigma \\
\mu & \mu \\
\mu & \mu \\
p & a & tʰ \rightarrow t \ ə
\end{array}
\]
Segmental inhibition

(2) Structure of [kʰuxpan] cupan

\[
\begin{array}{c}
\text{Ft} \\
\sigma \\
\kappa \\
k^{h} \ u \ x \ p^{h} \ a \ n \\
|\text{spread glottis}| \\
\end{array}
\]

The analysis

· The structure of cupan shows a mix of segmental and prosodic inhibition
· Underlyingly |spread glottis| [pʰ] undergoes fission to produce (in this dialect) [x]
· The |spread glottis| feature of [x] is licensed because it is in the head foot (prosodic inhibition)
· |spread glottis| is not delinked from [pʰ] because of the double linkage (segmental inhibition)

Parallels

· Essentially the same situation in linmæli Icelandic (Jóhannes G. Jónsson 1994, Ringen 1999, Gunnar Ólafur Hansson 2003, Kristján Árnason 2011)
  - Contrast foot-internally: [kʰɔpːi] kobbi ‘young seal’ vs. [kʰɔhpɪ] koppi ‘chamber pot’
  - No contrast outside the head foot: [fu:ta] fata ‘barrel’, *[fu:tʰa]
  - Only real difference with Gaelic is weight-to-stress: kobbi has a geminate, Gaelic (apparently) does not (but cf. ‘fortis’/‘lenis’ in Ulster Irish per Wagner 1959)
· Danish (Basbøll 2005): [pʰ th kʰ] only foot-initially, otherwise [p th k] only (or further developments)
· English: Liverpool English stop lenition (Honeybone 2001), flapping in American & Ulster English (Honeybone 2012), [r]-deletion (Harris 2012) all foot-based

3.2 Foot structure in Gaelic

Preaspiration and morae

· The analysis given above requires that preaspiration project a mora
· This can be extended to other varieties of Gaelic
· South Argyll Gaelic: Islay (Holmer 1938), Jura (Jones 2000, 2006, 2010), Colonsay (Scouller 2015), potentially also Manx (Ó Maolalaigh 2014)
Preaspiration and prosodic structure in North Argyll Gaelic

- Glottal stop insertion

(3) a. [mɛʔ] math ‘good’
   b. [Raʔtun] radan ‘rat’

- Stress-to-weight (Smith 1999), or probably more precisely Main-to-Weight (McGarrity 2003, Bye & de Lacy 2008)

(4) a. [ˈsruʔ] sruth ‘stream’
   b. [sru-ˈtʃiːnəɣ] sruth-lìonadh ‘flood’
   c. ‘Cha bhi stad ann an lide nach eil fo phriomh chudrom na h-abairt’ (Jones 2006, p. 198)

- Crucially, preaspiration in these varieties contributes a mora, making glottal stop insertion unnecessary

(5) a. [ˈtʰɑhpi] tapaidh ‘clever’
   b. [ˈkʰohpan] cupan ‘cup’

- The stress-to-weight effect is reminiscent of Ó Baoill (1980): prominence of stressed syllable

3.3 Prosodic structure in non-preaspiring dialects

Is there neutralization in other dialects?

- We suggest we don’t know
- ‘Preaspiration’ noted after long vowels in sources
  - Gaelic lenis stops are actively devoiced, like in Icelandic or Danish, not partially voiced as in English or German
  - Thus, we expect some coarticulation between the vowels and the glottal spreading associated with the lenis stop
  - Breathy preaspiration before lenis stops even after short vowels (Nance & Stuart-Smith 2013)

   Just because there’s a [ʰ] in the transcription doesn’t mean it’s the same thing

Potential diagnostics

- One potential diagnostic is duration: if [ht] behaves like [st], this may be evidence of a moraic segment
  - Duration of preaspiration itself
  - VOT after the stop
- We know there is diversity across dialects on this (Ní Chasaide 1986, Iosad 2015)
Coda: contact origins

- A reasonable hypothesis (Iosad 2015) is that the most archaic type of preaspiration (Lewis and Ulster Irish; see also Clayton 2010) is the one where preaspiration does not contribute a mora
- Phonologization: preaspiration goes from phonetic implementation to phonology by interacting with moraic structure
- Same internal development from Proto-Nordic to Icelandic (Pétur Helgason 2002)

There is potentially no explanandum that requires exclusively Norse ⇒ Gaelic transfer

Summary

- North Argyll Gaelic does demonstrate the /xp xt xk/ type of preaspiration
- Dialects such as these are important because they allow us to disentangle phonological preaspiration and vowel-consonant coarticulation
- Argyll Gaelic shows good evidence for moraicity of preaspiration
- Foot structure is important in Gaelic phonology: not just stress
- There may be a foot-based lenition pattern in Gaelic phonology
- Further evidence that contact explanations are not necessary

References

Preaspiration and prosodic structure in North Argyll Gaelic


Scouller, Alastair MacNeill. 2015. Inter-related prosodic features in a dialect of South Argyll. Presentation at Teangeolaocht na Gaeilge XV, Maynooth University.

