

Glottal stop insertion in Scottish Gaelic and contrastive syllabification

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1 Glottal stops and pitch accents in Scottish Gaelic

1.1 Pitch accents in Hebridean Gaelic

Pitch accents in Hebridean Gaelic

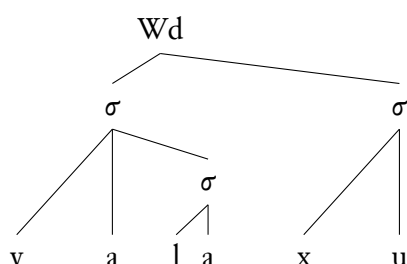
- It is well-known that Hebridean (e. g. Lewis) dialects show a contrast between two types of ‘pitch accents’/‘word tones’ (Borgstrøm 1940; Oftedal 1956; Ladefoged et al. 1998)
- Long rise (late peak)
 - Historical monosyllables: [ˈpo:] ‘cow’ (OI *bó*)
 - Including svarabhakti words: [ˈpalʲak] ‘bellows’ (OI *bolg*)
- Rise-fall (early peak)
 - Historical disyllables: [ˈpalʲəx] ‘boy’
 - Including hiatus words: [ˈpo:] ‘underwater rock’ (ON *boði*)

Pitch accents reflect syllabic structure

- Following Ladefoged et al. (1998); Ladefoged (2003), it is possible to analyse the pitch contours as reflecting syllable counts
 - The pitch contours: if the pitch accent is H*+L, the trailing tone can only appear in disyllables (rise-fall), in monosyllables we only see the H* rise
 - Rhyme palatalization: disyllabic plural [ˈpalʲɪç] ‘boys’ but monosyllabic [ˈpulʲukʲ] ‘bellows’
 - Invisibility to syncope: [ˈobəðʲ] ‘work’, gen. sg. [ˈobrəx] rather than *[ˈobəðʲəx] but [ˈvalaxu] rather than *[ˈvalxu] ‘boys (voc. pl.)’

Pitch accents as synchronic syllable count

- Smith (1999) analyses the svarabhakti vowels in *balg* and *bhalachaibh* with complex prosodic machinery (recursive syllables)



- But they are basically inert
- Proposal: these vowels are absent from *surface* phonological representations

Pitch accents as synchronic syllable counts

- Thus, *balg* is phonologically [palʲk]
 - Explains the tonal contour (Ladefoged et al. 1998)
 - Explains the rhyme palatalization to [pulʲki]
 - Explains the behaviour with respect to syncope
- Some things need ironing out
 - Dialects like Barra (Borgstrøm 1937; Clements 1986) where the svarabhakti vowel is not always an exact copy ([ˈpulʲiki] *builg*)
 - Historical svarabhakti before deleted segments: [ˈfala.i] with ‘monosyllabic’ rising pitch (*falbhaidh* ‘will go’)
- Still, this analysis makes sense (Ofstedal 1956)

1.2 Glottal stops in southern Gaelic

Glottal stops in southern Gaelic

- Much like Danish *stød* corresponds to Norwegian and Swedish pitch accent, in southern Gaelic the Hebridean pitch accents correspond to glottal stop insertion
- Argyll (Holmer 1938; Jones 2000), Tiree (Ternes 1980), see also Ternes (2006); Eliasson (2000)
- Tiree [poʔo] ‘underwater rock’ (Hebridean [ˈpo:] with rise-fall), [ˈpo:] ‘cow’ (Hebridean [po:] with rise)

- Smith (1999) suggests that the southern glottal stop is due to a stress-to-weight (Prince 1992; Bye and de Lacy 2008) requirement: if a stressed syllable cannot be bimoraic, insert a glottal stop
- Questions
 - Is GSI a live process? Yes
 - Is Smith (1999) correct? Yes

2 Glottal stop insertion as stress-to-weight

2.1 Glottal stop insertion is phonological

Is GSI phonological?

- A lot of the evidence is static
 - (1) a. No glottal stop insertion in heavy syllables

(i)	[^h tʰrɑ _μ i _μ]	<i>tràigh</i>	‘shore’
(ii)	[^h kʰlʲuː _{μμ}]	<i>cliù</i>	‘fame’
(iii)	[^h pjɔː _{μμ}]	<i>beò</i>	‘alive’
 - b. Glottal stop insertion is subminimal monosyllables

(i)	[^h tʰi _μ e _μ ʔ _μ]	<i>teth</i>	‘hot’
(ii)	[^h mɛ _μ ʔ _μ]	<i>math</i>	‘good’
(iii)	[^h kru _μ ʔ _μ]	<i>gruth</i>	‘curds’
- Evidence from alternations shows that at least in some cases it is a live phonological process

Inflection

- Adding inflectional suffixes/clitics leads to open/closed syllable alternations
 - (2) a. Open syllables, glottal stop inserted

(i)	[^h kʰu _μ ʔ _μ .riç mi]	<i>cuiridh mi</i>	‘I will put’
(ii)	[^h xu _μ ʔ _μ .rə tu]	<i>chuireadh thu</i>	‘you would put’
 - b. Closed syllables, no glottal stop

(i)	[^h xu _μ r _μ mi]	<i>chuir mi</i>	‘I put (past)’
(ii)	[^h xu _μ r _μ u]	<i>chuir thu</i>	‘you put (past)’

Syncope

- Noted by Smith (1999)
- Open/closed syllable alternations due to syncope

- | | | | | | |
|-----|----|------|--------------|-----------------|----------|
| (3) | a. | (i) | [ˈtɔ̥r̥.rəs] | <i>dorus</i> | ‘door’ |
| | | (ii) | [ˈtɔ̥r̥.ʃən] | <i>doirsean</i> | ‘doors’ |
| | b. | (i) | [ˈpɑ̥l̥.lə] | <i>baile</i> | ‘place’ |
| | | (ii) | [ˈpɑ̥l̥.tən] | <i>bailtean</i> | ‘places’ |

Phrase-level resyllabification

- Data from Jura (Jones 2000)
 - No GSI in closed syllables as expected
- (4) [fən ləm] *fan leam* ‘stay with me’
- Postlexical syllabification takes a normally weight-bearing segment out of the onset
- (5)
- | | | | |
|----|-------------------|--------------------|-------------------|
| a. | [ʏɛʔ.n ə] | <i>dh’fhan e</i> | ‘he stayed’ |
| b. | [stɑʔ.t əŋ kʰɑ:r] | <i>stad an càr</i> | ‘stop the car’ |
| c. | [koʔ.p əŋ ɛ:n] | <i>gob an eun</i> | ‘the bird’s beak’ |

2.2 The glottal stop is a moraic coda

The prosodic affiliation of the glottal stop

- Smith (1999) proposes that glottal stop insertion is triggered by stress-to-weight
- In other words, [ʔ] is a coda
- This is important in cases like [poʔo] *bodha*: VC.V syllabification?
- Argued to be impossible
- VC.V syllabification can be reported by speakers (Ní Chiosáin, Welby, and Espesser 2012)
- But examples of core phonological phenomena involving it are more difficult to find
- I argue that southern Gaelic is an example

The glottal stop and weight-to-stress

- As Smith (1999) observes, the glottal stop appears in open syllables as discussed above
- Tellingly, it does not appear before svarabhakti vowels: [marəv] ‘dead’, consistent with surface-phonological [marv]
- Jones (2000) provides more evidence for the connection with moraicity
- The rule is that there is no GSI in closed syllable is not ‘fully regular’ (*gu léir cunbhalach*) in Jura
- We do get forms like [fɛʔn] ‘stay’ alongside [fən]

The connection with fortis sonorants

- According to Jones (2000), word-final [n l r] in forms like [fɛn] are long
 - GSI overapplies in closed syllables only before [n l r]
 - Obviously, these are the segments participating in the ‘fortis’ contrast
- ☞ The GSI overapplication is a type of compensatory lengthening before underlyingly moraic sonorants like lengthening/diphthongization (Ní Chiosáin 1991)

3 Contrastive syllabification in Scottish Gaelic

3.1 Pitch accent and GSI as syllabic structure

Why is this important again?

- If I have convinced you that glottal stop insertion creates moraic codas in light syllables, we are in a position to reconsider [poʔo] ‘underwater rock’
- I suggest that the contrast between something like [poʔo] ‘underwater rock’ (*bodha*) and [po:] ‘cow’ (*bó*) is underlyingly one of *syllable structure*: /po(o)_σ/ vs. /poo/
- Syllable structure has been assumed to be completely predictable
- For instance, for McCarthy (2007) syllabification does not introduce a LUM because there are no faithfulness constraints for syllabification

Weight-to-stress or hiatus?

- Returning to [poʔo], how do we know that the glottal stop is not a hiatus-breaker?
- We know that hiatus is repaired by contraction
- Syncope deletes the second syllabic node (even if it stored), triggering contraction

- (6)
- | | | | | |
|----|------|-------------|----------------------|----------|
| a. | (i) | [ˈjoʔur] | <i>leabhar</i> | ‘book’ |
| | (ii) | [ˈjowriçən] | <i>leabhraichean</i> | ‘books’ |
| b. | (i) | [ˈuʔul] | <i>ubhal</i> | ‘apple’ |
| | (ii) | [ˈu:lən] | <i>ubhlan</i> | ‘apples’ |

- No explanation for this interaction if the glottal stop has nothing to do with syllabic structure

3.2 Against empty onsets

Stored syllable structure all around

- Clements (1986); Smith (1999) have proposed to derive unusual syllabification effects in Scottish Gaelic by postulating empty onset consonants
- In /po_o/, the empty onset creates an open syllable
- Conceptually, I can't see an objection against empty segments
- However, how do we know they are *onsets*?
- Syllabification is done by the phonology
- Normally, syllabification is driven by sonority (e. g. Zec 1988; Morén 2001; Topintzi 2010)
- But...
 - How sonorous is an empty segment?
 - How do we know that the best prosodification doesn't involve, say, deletion?
- The whole idea stands and falls on the onset status of the empty consonant
- But that's essentially storing a syllabic treelet

Wrapping up

- Glottal stop insertion in southern Scottish Gaelic is driven by constraints on syllabic structure
- The existence of unpredictable glottal stops (and Hebridean pitch accents) shows that syllabic structure is not fully predictable
- Best analysis: assume that syllabic structure can also be stored (cf. Vaux 2003)

☞ After all, we can store

- Foot structure (e. g. lexical stress)
- Moraic structure (lexical vowel length, lexical geminates)
- So why not syllabic structure?

☞ Syllables are not special

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