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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: [ˈpoː] 'cow' (OI bó)
  - Including svarabhakti words: [ˈpälˠak] 'bellows' (OI bolg)
- Rise-fall (early peak)
  - Historical disyllables: [ˈpálˠax] 'boy'
  - Including hiatus words: [ˈpɔː] 'underwater rock' (ON bòði)

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 [pálˠəx] 'boys' but monosyllabic [pulʲuk] 'bellows'
Pitch accents as synchronic syllable count

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

\[
\begin{array}{c}
\text{Wd} \\
\sigma \\
\sigma \\
\sigma \\
v \\
al \\
al \\
x \\
u \\
\end{array}
\]

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

Pitch accents as synchronic syllable counts

- Thus, *balg* is phonologically [palˠk]
  - Explains the tonal contour (Ladefoged et al. 1998)
  - Explains the rhyme palatalization to [pulˠk]
  - 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 ([ˈpulˠk] *builg*)
  - Historical svarabhakti before deleted segments: [ˈfala.i] with ‘monosyllabic’ rising pitch (*fälbaith* ‘will go’)

- Still, this analysis makes sense (Oftedal 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)
• 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) [ˈtʰռɛɪɾɪ.ɪ.μ] tràigb ‘shore’
     (ii) [ˈkʰɛɪɾɪ.ɪ.μ] cliù ‘fame’
     (iii) [ˈpjɛɪɾɪ.ɪ.μ] beò ‘alive’

  b. Glottal stop insertion is subminimal monosyllables

     (i) [ˈtʰɛɪʔɪ.μ] teth ‘hot’
     (ii) [ˈmɛɪʔɪ.μ] math ‘good’
     (iii) [ˈkɾuɪʔɪ.μ] gruth ‘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) [ˈkʰɛɪɾɪ.ɪ.ɾɪ.ɾɪ.ɾɪ.μ] cuiridh mi ‘I will put’
     (ii) [ˈxuɪɾɪ.ɪ.ɾɪ.ɾɪ.ɾɪ.μ] cbuireadhb tu ‘you would put’

  b. Closed syllables, no glottal stop

     (i) [ˈxuɪɾɪ.ɪ.ɾɪ.ɾɪ.ɾɪ.μ] chuir mi ‘I put (past)’
     (ii) [ˈxuɪɾɪ.ɪ.ɾɪ.ɾɪ.ɾɪ.μ] chuir tu ‘you put (past)’

Syncope

• Noted by Smith (1999)

• Open/closed syllable alternations due to syncope
(3) a. (i) [ˈtɔtməɾəd] dorus ‘door’
   (ii) [ˈtɔməɾən] doirsean ‘doors’
   b. (i) [ˈpɑməl̩] biel biir(e)l dorus ‘doors’
   (ii) [ˈpɑmə˘len] bailtean ‘places’

Phrase-level resyllabification

- Data from Jura (Jones 2000)
- No GSI in closed syllables as expected

(4) [fɛn lɛm] fan leam ‘stay with me’
- Postlexical syllabification takes a normally weight-bearing segment out of the onset

(5) a. [ɣɛʔ.n a] dh’fhan e ‘he stayed’
   b. [stɑʔ.t əŋ kʰaːr] stad an càr ‘stop the car’
   c. [koʔ.p ənʲ ɛːn] gob an eun ‘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 (Ni 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 cunbalach) in Jura
- We do get forms like [fɛʔn] ‘stay’ alongside [fɛn]
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’ (bodba) and [po:] ‘cow’ (bó) is underlyingly one of syllable structure: /po(o)ə/ 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] leabbar ‘book’
   (ii) [ˈjowriçən] leabbraicbean ‘books’

b. (i) [ˈuʔul] ubbal ‘apple’
   (ii) [ˈuːlən] ubblan ‘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
References


Jones, George. 2000. ‘Beagan mu’n stad ghlotasach ann an Gàidhlig Ceann a Deas Earraghadhail.’ *Scottish Gaelic Studies* 20:201–211.


