Sandhi, mutation and contrast: laryngeal phonology in Plougrescant Breton

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Laryngeal phonology in Plougrescant Breton: sandhi, mutation, and contrast

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Talk outline

1. Laryngeal phonology in a Breton dialect
2. Final devoicing is loss of contrast, not loss of feature
3. Sandhi voicing is phonetic implementation (mostly)
4. Devoicing sandhi do not need \([-\text{voice}]\)
5. Privative laryngeal features will do
6. Implications

Background

bohydr

Previous work

Krämer (2000)

- Île de Groix Breton (Ternes, 1970)
- Argued to exhibit a ternary contrast between \(+[\text{voice}]\), \([-\text{voice}]\), and \([\text{voice}]\) segments
- Evidence for binary features
- Final devoicing is loss of features

Hall (2008)

- Same dialect, same source
- Privative features with feature geometry
- Feature disalignment
- Final devoicing is loss of features and loss of contrast
The present approach

- Work in progress, (almost) nothing is final
- Features are privative with feature geometry
- “Final devoicing” is loss of contrast
- Devoicing sandhi is
  - Either lexical phonology
  - Or failed mutation due to geminate inalterability
- Argument for substance-free phonology
- Tested on Plougrescant Breton (Jackson, 1960)

Breton dialects

- Traditionally divided into four groups
  - Cornouaillais, Trégorrois, Léonais (KLT): relatively homogeneous, basis for standard language
  - Vannetais (south-east): very divergent, sometime even served by own literary tradition (Guillevic & Le Goff, 1902)
- Île de Groix is a Vannetais dialect
- Source rather messy (“phonemic” approach, not very systematic)
- Here: attempt to look at a less messy data point
- Plougrescant is a Trégorrois dialect; description by Jackson (1960) more systematic
- Further outlook: extend approach to Île de Groix if possible

Consonant inventory

<table>
<thead>
<tr>
<th>Manner</th>
<th>Labial</th>
<th>Alveolar</th>
<th>Postalveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Uvular</th>
<th>Laryngeal</th>
</tr>
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<tbody>
<tr>
<td>Stop</td>
<td>p</td>
<td>b</td>
<td>t</td>
<td>d</td>
<td>c</td>
<td>j</td>
<td>k</td>
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<tr>
<td>Fricative</td>
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<td>Glide</td>
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<td>j</td>
</tr>
</tbody>
</table>

- Length contrast for all consonants except voiced obstruents

Vowel inventory

- Length is only licensed by (main) stress
Restrictions on laryngeal features

- Voiced and voiceless obstruents contrast word-initially; short allophones:

  1. [pesk] ‘fish’
  2. [børre] ‘morning’
  3. [lo:ɔt] ‘mice’

- Voiced and voiceless obstruents contrast immediately following unstressed vowels; short allophones:

  4. [boto:] ‘shoes’
  5. [sædɔt] ‘chained (participle)’
  6. [kry:no] ‘peals of thunder’

Restrictions on laryngeal features

- Following long stressed vowels, consonants can only be short; voiceless obstruents do not occur:

  a. [ɔ:ber] ‘to do; to make; to work’
  b. [li:ɔr] ‘letter’
  c. [mɛlɔn] ‘yellow’

- Following short stressed vowels, consonants are long; voiced obstruents cannot be long, so they are excluded:

  a. [tæpɔt] ‘to take’
  b. [jɔkɔx] ‘more healthy’
  c. [skɔdɔlɔ] ‘basins’

Restrictions on laryngeal features

- Word-finally following a stressed vowel, voiced obstruents are not permitted. Consonants are short following long stressed vowels and long following short stressed vowels:

  a. [toːk] ‘hat’
  b. [meːl] ‘honey’
  c. [ɡrwek:] ‘woman, wife’
  d. [mɛl] ‘ball’

Summary

- Leaving final devoicing aside for a moment, laryngeal features are mostly predictable:

- Laryngeal contrasts are allowed in the onset of the first syllable and of the stressed syllable.

- Otherwise they are predictable:

  - Voiced following unstressed (always short) vowels
  - Voiced when single and following long stressed vowels
  - Voiceless (and long) when single and following short stressed vowels.

- What is contrastive? What is marked?
Final devoicing

- At first blush final devoicing looks normal

(7)  a. [byga'lejo] ‘children’
     b. [by'ga:lIc] ‘child’

- But what about vowel length?
- This is a good question

Final devoicing in monosyllables

- The really interesting part is when a stressed vowel precedes
- Stress is normally penultimate in KLT (but not in Vannetais!), so this is mostly monosyllables and a few words with final stress
- If it is vowel length that is distinctive, we expect V:C#

(8)  a. ['to:go] ‘hats’
     b. ['to:k] ‘hat’

- And cf. minimal pairs like

(9)  a. [kas:] ‘send!’ ([s] never voiced, French borrowing)
     b. ['ka:s] ‘cat’ (cf. orthographic kaz)

Final devoicing in monosyllables

- This isn’t really devoicing in view of what we know about quantity and voicing
- This is incomplete neutralization
- Confer real devoicing:

(10)  a. [lO'go:d@n] ‘mouse’
      b. [lO'got:a] ‘to hunt mice’

- Side note: it isn’t always about voicing per se:

(11)  a. ['ro:his] ‘people of ar Roc’h’
      b. ['ro:cx] ‘ar Roc’h (placename)’

- Not really surprising if you know (some) [h] is historically *v, but must be accounted for

Final devoicing in monosyllables

- Does real final devoicing happen? Well, yes
- There is variation described by Jackson (1960) as “free”, and especially with coronals
- Context probably unknowable; the ambition here is at best to find which representations are involved

(12)  [ty:t]~[tYt:] ‘people’ (orthographic tud)

- More examples to come immediately below, as they involve sandhi to which we now turn
- What about lexically voiceless finals? These are relatively few, French borrowings of various antiquity, and behave as expected, cf. (9-a)
The traditional view (Stephens, 1993; Favereau, 2001) is essentially that all consonants are voiced in sandhi before [+voice] segments:

(13)  
- a. [pweːləz 'əːz]  ‘if you saw me’
- b. [mab 'neːwe]  ‘new son’
- c. [pɔb 'biːn]  ‘little youth’

And voiceless before voiceless consonants:

(14)  
- a. [map 'hiːr]  ‘tall son’
- b. [ɔn 'dyt 'kapːap]  ‘the able people’

Plus there is the devoicing sandhi that is the focus of Krämer (2000) and Hall (2008):

For Île de Groix Ternes (1970) describes it as a lexical distribution: some words, and only these words, devoice initial obstruents following an obstruent:

(15)  
- a. [lɔːt ˈtɪ]  ‘said to me’, cf. [diː] ‘to me’
- b. [kankuʃ]  ‘100 times’, cf. [ˈtərguʃ] ‘thrice’

In the narrative texts given by Jackson (1960), the sandhi rules are often violated:

(16)  
- a. [map 'dɪː]  ‘black son’
- b. [mɛrχ 'vaːt]  ‘good girl’
- c. ['dwan tɔːs 'diːwɪ] ‘the fear that you have of me’

Jackson (1960) explains the texts were dictated at a slow pace.

Outline of analysis:

- Outline feature analysis
- Argue that final devoicing without length permutations is a phonetic process
- Argue that sandhi voicing is the flip side of final devoicing
- Unify some devoicing sandhi with “failure of mutation”
- Tentatively propose that other devoicing sandhi are an artifact of univerbation

However, some (in fact most) of the examples, such as (16-a) and (16-b), are transcribed with a secondary–main stress rhythm; these are possibly genuine connected phrases.

Thus failure of sandhi is not necessarily an artefact of dictation.

Note that vowels outside main-stressed syllables are shortened, so the preservation of length contrasts under devoicing does not work in the same way when stress is secondary.
Feature analysis

▶ Before we even discuss final devoicing, we should solve the [voice]/[spread glottis] problem
▶ Phonetics rather poorly understood
▶ Voiceless stops are described as aspirated (at least initially) at Le Bourg Blanc (Falc’hun, 1951) and Saint-Pol-de-Léon (Sommerfelt, 1978), but these are both Léonais
▶ No mention of aspiration is made for Plougrescant by Jackson (1960, 1967)
▶ In all cases the voiced stops are described or assumed to be voiced
▶ One possible point: at Plougrescant fricatives underwent a context-free voicing (“new lenition”), cf. Southern English Fricative Voicing, which Honeybone (2005a) takes as evidence for [spread glottis]:∅
▶ But Honeybone (2005a) himself admits the analysis of fricatives should not be spread to stops uncritically

Final devoicing

▶ I propose that final devoicing is in fact loss of the laryngeal node, i.e. it is the exclusion of the very possibility of contrasting for laryngeal features
▶ Devoiced stops are a third phonological category: they behave differently from true voiceless stops in that they do not obey length-related restrictions
▶ True voiceless stops cannot follow long vowels; devoiced stops can
▶ In particular, what is the difference between final devoicing as in [tyːt] and final devoicing with gemination as in [tvtː]?
▶ No tableaux in analysis (but hopefully it is pretty theory-independent)

Feature analysis

▶ In substance-free phonology with emergent privative features, this point is rather moot
▶ We are interested in the patterning, whether the “voiceless” obstruents are labelled [spread glottis] or [voiceless] (cf. Blaho, 2008) is irrelevant
▶ Or voiced stops are [voice] or [stiff], of course
▶ I propose that in Plougrescant Breton “voiceless stops” are [voiceless] and “voiced stops” do not bear a laryngeal feature, but do have a laryngeal node
▶ I return below to why nodes are better than features
▶ Main reason is restricted distribution: only initial and stressed syllables, both reasonable contexts for positional faithfulness (Beckman, 1999; Smith, 2002)
▶ We need to make reference to this feature to derive the restrictions (but not to describe final devoicing as I argue below)
▶ In that sense it is “marked” (Trubetzkoyan markedness)

Assumptions of analysis

▶ Vowel length distinctive in main-stressed syllables: faithfulness ≫ markedness in this context
▶ *[voiceless] above MAX[vcl]
▶ Except for positional faithfulness: MAX[vcl]/Initial and MAX[vcl]/σ above *[vcl]
▶ Final devoicing driven by a constraint *Lar/...vd militating against any segments with a laryngeal node at the end of a (morphological?) Word
Medial obstruents: /Vt/

- Obstruents are long and voiceless following short stressed vowels

\[
\begin{array}{c}
\hat{\sigma} \\
\downarrow \\
in \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\quad
\begin{array}{c}
\hat{\sigma} \\
\downarrow \\
in \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\]

- The voiceless obstruent piggybacks on \textsc{Main-to-Weight} to be parsed into the stressed syllable and thus keep [vcl]
- This is assuming (as I do) that faithfulness to vowel length is undominated

Medial obstruents: /Vd/

- Assuming richness of the base, what happens with voiced obstruents after short vowels?

\[
\begin{array}{c}
\hat{\sigma} \\
\downarrow \\
in \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\quad
\begin{array}{c}
\hat{\sigma} \\
\downarrow \\
in \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\]

- Assume a constraint *\textsc{Lar}/\mu: geminates without laryngeal specifications exist in the language (geminate sonorants)
- This is of course outranked by positional faithfulness to [vcl] to derive the previous case

Medial obstruents: /V:t/

- The obstruent loses its laryngeal specification in order to become moraic for the benefit of \textsc{Main-to-Weight}
- Laryngeally unspecified obstruent geminates are realized as voiceless for obvious phonetic reasons
- Maybe these are excluded by \textsc{Lexicon Optimization} since the learner never really has to posit /b:/?

\[
\begin{array}{c}
\hat{\sigma} \\
\mu \\
\downarrow \\
1 \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\quad
\begin{array}{c}
\hat{\sigma} \\
\mu \\
\downarrow \\
1 \\
\text{Lar} \\
\downarrow \\
[vcl]
\end{array}
\]

- No superheavy syllables, so [vcl] cannot be saved
Final devoicing: voiced stops

- No Lar node word-finally
- Final consonant is extrametrical (so maybe no Lar node not licensed by prosodic structure?)
  - Stress: ultimate if V: in final syllable, else penultimate. Moraic trochee, but then final VC must be L

![Diagram](image1)

Final devoicing: voiced stops

- Laryngeally unspecified obstruents in pausa are realized as voiceless, phonetic reasons are well-known
- What if our [vcl] is really [spread glottis] in this dialect?
- It is apparently unproblematic to have aspiration as the phonetically natural realization of phonological underspecification (Vaux & Samuels, 2005)
- What about cases such as [tyːt]~[tvːt]?
- I propose this is real final devoicing, i.e. the imposition of the [vcl] feature at word (phrase?) edges (Iverson & Salmons, 2007)
- First let’s look at underlying voiceless obstruents

![Diagram](image2)

Final voiceless stops

- The [vcl] obstruent becomes moraic to satisfy MAIN-TO-WEIGHT, so the restrictions on vocalic quantity hold

![Diagram](image3)

True final devoicing

- In this scenario, forms such as [tvːt] for /tyːd/ imply that the constraint driving final devoicing is ranked over faithfulness for vowel length.
Final devoicing: summary

- I have argued that what looks like normal final devoicing is in fact the deletion of a Lar node, or absence of contrast
- Further evidence: final /v/ does not always neutralize with /f/ phonetically: Jackson (1960) writes [v]
- We know [v] is aerodynamically complicated (Padgett, to appear)
- So this would be consistent with a phonologically underspecified /v/?
- Final devoicing as final fortition (Iverson & Salmons, 2007) is distinct from this process and also attested
- Grazing other dialects: final devoicing is optional at Saint-Pol-de-Léon (Sommerfelt, 1978)

Voicing sandhi

- In this system, voicing sandhi arise from two sources
- Before sonorants: laryngeally unmarked stops are voiced in the phonetics
- Sonorants do not contrast for laryngeal features, so they do not have a [Lar] to spread
- Explains variability (pause-sensitivity?)
- No need to have (contrastive) laryngeal features for sonorants (Krämer, 2000; Blaho, 2008; Hall, 2008)
- [mаб 'не:ве] = /mаб ne:we/

Voicing assimilation sandhi

- Before obstruents, we are faced with two options
- Same as above
  - Explains possible devoicing even before voiced obstruents
  - Possibly predicts that under certain phonetic circumstances final consonants may be voiced before voiceless consonants?
- Spread of Lar, with [vel] if need be
  - Variation must have a phonological explanation (stochastic ranking?)
  - Devoicing sandhi crucial piece of evidence in favour

Devoicing sandhi

- Some examples of devoicing sandhi

  (17)  
  a. [lа:t ʨi] ‘said to me’
  b. [me ’gaf ʨi] ‘I find, I consider’ (lit. ‘I get to me’)
  c. [də ‘wen:ɕak ’tит] ‘your two sous’ (lit. ‘two sous to you’)

- Prepositions are overrepresented
- Actually, this is also true of Île de Groix!

  (18) [тра нa’ваŋк tmp]’we don’t miss anything’ (lit. ‘nothing is missing to us’)

- What’s with the prepositions?
Detour 1: mutation

- Breton is (widely?) known for its initial consonant mutation
- Here we are only interested in lenition

<table>
<thead>
<tr>
<th>Underlying</th>
<th>p</th>
<th>t</th>
<th>k</th>
<th>b</th>
<th>d</th>
<th>g</th>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mutated</td>
<td>b</td>
<td>d</td>
<td>g</td>
<td>v</td>
<td>z</td>
<td>h</td>
<td>v</td>
</tr>
</tbody>
</table>

- The interesting bit is the voicing of voiceless stops

Detour 2: prepositions

- Historically, prepositions in Brythonic have tended to undergo the effects of soft mutation/lenition in a context-free way
- Old Welsh and Old Breton *gurth* 'through', Modern Welsh *wrth*, Modern Breton *ouzh*
- Old Welsh *di* 'to', Modern Welsh *i* (via *[ði]*)
- Modern Welsh variation: *trwy* ∼ *drwy* 'through'

Detour 2: prepositions

- Why is this important?
- At least in Welsh, there is evidence that the new initial consonant is not fully lexicalized
- In particular, *gan* 'with' is historically *kant*
- The conjunction *a* 'and' causes a mutation whereby voiceless stops are spirantized to *[f θ χ]* but voiced ones are unaffected
- We expect *a gan* for 'and with', but it is actually *a chan* (Morgan, 1952; Ball & Müller, 1992)
- The same is true of *dros* and *drwy* though there the variants with the voiceless stop survive in the modern language
- So maybe *gan* is really *[L]can* underlingly
- Where *[L]* is the autosegment (Wolf, 2007)

Back to Breton: devoicing sandhi

- I propose that (some) Breton devoicing sandhi reflect the same incomplete lexicalization of the voiced stops
- Consider *lavare*[t  t]*iñ*

```
   "t" [L]  "t"

  "Lar"

  ["vel"]
```

- Normally, *[L]* docks to the following /t/, e.g. due to MAXFLT (Wolf, 2007)
- But not when the Lar node spreads to a preceding root node
Devoicing sandhi

- This can be for any number of reasons
  - Some version of geminate inalterability
  - Structure sharing inhibits weakening processes (Honeybone, 2005b)
  - Under certain assumptions, the structure shown is not convex (Scobbie, 1997)

- Further evidence for this approach comes from so-called “failure of mutation” (Jackson, 1967, §481)
- Lenition of voiceless stops is said to “fail” when an adjective (given the necessary morphosyntactic conditions) follows an obstruent-final noun
- But with sonorant-final nouns or voiced stops mutation happens
- Cf. kaer ‘beautiful’
  
  (19) a. un dimezell gaer
      a maiden beautiful
  
  b. ur vaouez kaer
      a woman beautiful

- Morphosyntax actually irrelevant, since other triggers of this mutation are sonorant-final

What, autosegments?

- In previous work I have doubted that the autosegmental approach is suited to Brythonic Celtic mutations (cf. also Green, 2006)
- I think these data are actually pretty solid evidence for autosegments or at least for a phonological analysis
- Breton is less problematic than Welsh morphosyntactically
- Breton mutation seems to be genuinely sensitive to prosody (Pyatt, 2003)
- There is still the problem of doing mutation phonologically: Wolf (2007) covers only a small subset
- In particular, the autosegment should cause deletion of [vcl] in the current approach
- Problem! But see Bye & Svenonius (2009) for an approach…
More devoicing sandhi

- Other types of devoicing sandhi do not seem to fall under this rubric

\[(20)\] a. \([\text{san kɔ̃neːri}]\) ‘Saint Gonery’
    b. \([\text{kankuf}]\) ‘thrice’, cf. \([\text{ṭerɡuf}]\) ‘thrice’

- I propose that here devoicing is due to univerbation, i.e. the relevant words are now compounds
- Word-internally voiceless obstruent clusters are (nearly) universal (also noted by Hall, 2008 for Île de Groix)

Summary and outlook: sandhi

- Voicing sandhi are mostly due to phonetic implementation of laryngeally unspecified obstruents in a phrasal context
- Some devoicing sandhi are due to inhibition of autosegmentally induced voicing
- Others might possibly not be phrasal sandhi at all
- Both of these phenomena seem to be cross-dialectal, so the account possibly extends to Île de Groix:
  - Prepositions
  - More examples: the “devoicing” word \([bɔ̃nak]\) ‘any’ is Middle Breton pennac (Lewis & Piette, 1962, §45)
  - The “provection in common phrases” (univerbation) is described as pan-Breton. Examples of devoicing sandhi in Île de Groix include ‘grey peas’ and ‘little finger’—intuitively good candidates for univerbation

Loss of feature or loss of contrast

- Here I have argued that Breton presents examples two types of final devoicing
  - Final devoicing as loss of contrast: cf. the arguments of Harris (2009) for FD as weakening
  - Final devoicing as edge alignment: final fortition (Iverson & Salmons, 2007)
- Take-home message here: there is no process of “final devoicing”, “final weakening” or “final fortition” that we can speak of in universal terms
- Argument for substance-free phonology

More devoicing sandhi

- Jackson (1967, §487): “provection in common phrases”
- Are these actually phrases or words?
  - Saint Gonéry is the patron saint of the local chapel

- ‘Thrice’ might well be a single word, cf. Welsh dwywaith ‘twice’, and in fact \([\text{guf}]\) is the reduced form, cf. stressed gwej ‘time, occasion’
- Etc.

Photo credit: Steffen Heilfort. Source.
Final devoicing as phonetics

- Growing body of work on final devoicing (and generally laryngeal assimilation) as a “low-level phonetic process”
- The Paradestück here is of course Dutch (Ernestus & Baayen, 2006, 2007; Jansen, 2007)
- Possibly others (e.g. the disputed claim for Polish)
- Breton seems to show quite good evidence for incomplete neutralization
- Laryngeally unspecified segments interpreted by the phonetics as devoiced or aspirated rather than [−voice] or [spread glottis] specified
- Needs careful cross-linguistic study

Ternary contrasts

- Krämer (2000) argues that the presence of both voicing and devoicing necessitates binary features, i.e. a ternary contrast
- Related issue: Uffmann (2009) asks how to distinguish between categorically voiceless and laryngeally unspecified stops in a privative system
- The answer is of course feature geometry
- Objection of Uffmann (2009): but this is an overgenerating notational variant of binary features

Tiers or features?

- One answer: who says we never need bigger feature geometry trees? It is correct that arboreal representations can have many levels, but maybe this is empirically better?
- Related answer: binary features are no more God-given/less stipulative: [o_voice], [1voice] and [2voice] are also a notational variant, but these are as overgenerating as trees
- Reason: three independent values of [F] cannot capture implication relations in the same way that feature geometry can
- Here I argue that the feature geometry/underspecification approach is empirically more adequate than one based on [±voice] spreading

- Here I use class nodes (as in e.g. Avery, 1996)
- Blaho (2008): no need for nodes if features can do the job, e.g. substitute Lar with [obst] since only obstruents are laryngeally specified
- Gives strange results for Breton, since final devoicing is driven by *[obst]: works formally but how insightful is it? Are the devoiced obstruents sonorants? (Well, why not)
- Here: nodes are necessary
Tiers or features?

- If features can only attach to nodes, the presence of a node (even with no features) is the formal correspondent of contrastive specification
- Sort of answers the concern of Uffmann (2009) on the difference between two types of feature absence
- Without nodes, how do we define tiers and all the autosegmental phenomena that come with them?
- Null hypothesis: all and only features dependent on a specific node are on the same autosegmental tier
- Field of empirical inquiry

Summary

- New interpretation of Breton data
- Possible cross-dialectal extension
- Privative features can do the job
- Feature/node geometry is preferable to binary features and (possibly) to node-less geometry.

Trugarez!


Bye, Patrik & Peter Svenonius. 2009. Extended exponence and non-concatenative morphology. MS., University of Tromsø.


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