Deconstructing mutation in Breton

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Plan

▶ What is “mutation”, and who’s in charge?
▶ Assumptions
  ▶ Substance-free representations
  ▶ Stratal computation
▶ Mutation in Breton
▶ It’s all phonological, but...
  ▶ Coalescence vs. floating features
  ▶ Stratal differences
  ▶ Triggering differences
▶ Overall, Breton mutation is not very problematic for phonological theory
▶ But we need to understand the triggering better

Consonant mutation

One definition
[T]he term “consonant mutation” refers to a class of processes by which a
consonant turns into a segment with a different degree of voicing, continuancy,
or nasality that is not due to neutralization or assimilation to a neighboring
segment of the same natural class. (Grijzenhout 2011)

▶ An example: Fula

(1) a. (i) [pullo] 'Fula person'
   (ii) [fulɓe] 'Fula people'

b. (i) [o warii] '(s)he came'
   (ii) [ɓe mbari] 'they came'

Analytical challenges

▶ What is the rationale, i.e. how do we describe the pattern phonologically?
▶ What is the mechanism: is it a piece of phonology, is there morphology
  involved? Anything else?
▶ What is the trigger: where do the mutation mechanisms come from?
  ▶ Is it just regular phonology?
  ▶ Is it phonological bits and pieces that happen to come from the lexicon?
  ▶ Is it phonological bits and pieces that are the exponents of some morphology?
  ▶ Is it just some totally random, subcategorization-driven insertion, i.e. the
debris of history (à la Yu 2007)? Although it still has to be inserted in
response to something...
Celtic mutations

- Sometimes seen as a “prototypical” type of mutation
- Huge literature: here’s just a selection (only the phonological literature)
- The phonology can be tricky
  - Chain shifts (e.g. Irish [p] → [f], [f] → ∅)
  - Funky changes (Irish [dʲ] → [ʝ] even as [bʲ] → [vʲ])
  - Unnatural classes (Welsh [m] → [v] but not [n] → [ð])

Previous treatments

- Once we abandoned arbitrarily triggered rules, the standard approach has been autosegmental
- Starting with Lieber (1983), also Swingle (1993); Wolf (2005, 2007)
- Problems: hard to get in (parallel) OT because of the high heterogeneity of changes
  - Hard to express with SPE features, contrast Ó Dochartaigh (1978); Ewen (1982); Grijzenhout (1995); Cyran (2010)
- Spirited defence by Wolf (2005, 2007) relies on somewhat suspect constraints
  - MAXFLOAT: not really explanatory, only works in concert with *FLOAT
  - No VACUOUS DOCKING: tricky to formalize
  - No TAUMORPHEMIC DOCKING: decidedly non-modular

Triggering

- Random lexical items
- Lexical items only under certain morphosyntactic conditions (e.g. definite article only if feminine singular — most Celtic languages)
- Certain morphosyntactic and/or linear conditions:
  - Welsh: adjectives mutate if governed by a fem sg noun — but only in NA order
  - ...although gender/number agreement still persists in AN constructions
  - Welsh: the XP-trigger hypothesis (Borsley & Tallerman 1996; Tallerman 2006; Borsley et al. 2007): “An XP mutates if it is c-commanded by the preceding adjacent XP”

Abandoning phonology I

- Problems with triggers
  - Random lexical items: OK, the autosegment is just part of the random item
  - Lexical items + morphosyntax: ambiguous
    - Homophony modulo the floating material: a bit inelegant
    - Mutation spells out the grammatical features (e.g. fem sg def): hasn’t really been tried to my knowledge
  - Pure syntax (like the XP trigger): utterly mysterious
    - Just insert an autosegment in this syntactic configuration (Lieber 1987; Borsley & Tallerman 1996)
    - Exception: Roberts (2005) tries to express the Welsh facts with Case
    - Tallerman (2006); Borsley et al. (2007) argue against the syntax
Abandoning phonology II

- Green (2006, 2007): mutation is like Case, a feature that words agree for
- The phonological rationale is arbitrary and a fact of lexical insertion
- Similar approaches: Stewart (2004); Iosad (2008), also Kaye & Pöchtrager (this workshop)
- But is “mutation” a thing?

Substance-free phonology

- Morén (2006, 2007); Blaho (2008); Youssef (2010); Iosad (in preparation)
- Phonology is an autonomous module of grammar
- No universal phonology-phonetics mapping
- No universal feature set (a bit like Mielke 2007)
- No functional considerations in computation
≠ Phonological representations are determined based on the patterns in each language at hand

Stratal OT

- Computation proceeds in three steps
  - Stem-level (at least root-to-stem, stem-to-stem derivation)
  - Word-level (stem-to-word)
  - Postlexical (word concatenation)
- Potential reranking across the strata
- “Bracket erasure”: only the output of the previous stratum is visible to each computation

Bothoa Breton mutations

- Breton dialect of Bothoa
- Description by Humphreys (1995)
- Somewhat atypical prosodic system
- But the mutation system is largely in line with what you find across Breton dialects
- With one exception that we come back to later
Background

Bothoa Breton consonants

See the appendix for the featural structures I propose

Manner | Labial | Coronal | Postalveolar | Palatal | Dorsal | Glottal
---|---|---|---|---|---|---
Stops | p b | t d | | k g |
Affricates | | | f s dʒ |
Fricatives | f v | s z | j |
Nasals | m n | | j |
Laterals | l | | |
Rhotics | r | | |
Approximants | w ɥ j | q | j |

Mutations: lenition

<table>
<thead>
<tr>
<th>Process</th>
<th>Voicing</th>
<th>Spirantization</th>
<th>Deletion</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmutated</td>
<td>p t</td>
<td>tf</td>
<td>hr</td>
<td>gw dʒ</td>
</tr>
<tr>
<td>Lenited</td>
<td>b d dʒ</td>
<td>r v v h</td>
<td>w v</td>
<td>d dʒ</td>
</tr>
</tbody>
</table>

▲ Note the heterogeneity of the processes
▲ Chain shift alert: [p] → [b] → [v]

Mutations: spirantization

<table>
<thead>
<tr>
<th>Process</th>
<th>Voicing</th>
<th>Fission</th>
<th>Spirantization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmutated</td>
<td>p t</td>
<td>tf (ɛ ø a)</td>
<td>k tf (i y) tfq kl kr kw</td>
</tr>
<tr>
<td>Spirantized, phonological</td>
<td>v z</td>
<td>hj h h hj hl hr hw</td>
<td></td>
</tr>
<tr>
<td>Spirantized, phonetic</td>
<td>[v] [z] [ɛ] [i] [h] [l] [q] [r] [w]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

▲ Note that the behaviour of [tf] is different depending on the following vowel
▲ Note spirantization-and-voicing of [p t] but not [b d]

Mutations: provection

<table>
<thead>
<tr>
<th>Process</th>
<th>Voicing</th>
<th>Devoicing</th>
<th>Prefixation of [h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmutated</td>
<td>b d dʒ</td>
<td>gw</td>
<td>Verse</td>
</tr>
<tr>
<td>Provented, phonetic</td>
<td>[p]</td>
<td>tf q</td>
<td>k kw f s j</td>
</tr>
<tr>
<td>Provented, phonological</td>
<td>p t</td>
<td>tf q</td>
<td>k kw f s j</td>
</tr>
</tbody>
</table>

▲ Basically, you devoice obstruents and prefix [h] to sonorants and vowels
**Analysis**

**Provection**

(2) a. (i) [ˈmaːb̥] son
   (ii) [oˈm̥maːb̥] your (pl.) son
   (iii) [oˈh̥maːb̥]  

b. (i) [ˈalve] key
   (ii) [oˈhalve] your (pl.) key

c. (i) [ˈbrøːr] brother
   (ii) [oˈprøːr] your (pl.) brother

▶ Best treated simply as coalescence with [h]
▶ If the clitic is /oh/, we only have to ensure coalescence
▶ This is simply phonology
▶ Prediction: provection is not morphologically constrained in interesting ways

Correct

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**Analysis**

**Spirantization**

**Detour: stratal aspects of palatalization I**

▶ Unlike other Breton dialects, Bothoa shows a process of palatalization
▶ /k y/ → [ʧ dʒ] / i, y
▶ This is exactly where we get [h] and not [hj] as the spirantization of [ʧ]

(3) a. [ˈʧiː] ‘dog’
b. [ə hiː] ‘a dog’
c. *[ə çiː]

▶ Makes sense that ‘dog’ is /ki/ (so in other dialects, too)
Detour: stratal aspects of palatalization II

- Crucially: palatalization is only active at the stem level
  - No tautomorphic [ki gi ky gy] (with one exception — it's OK, stem-level rules have exceptions; Bermúdez-Otero forthcoming)
  - No palatalization before word-level suffixes:
    ⑷ a. [ˈburkiɡ] ‘village population’
    b. [ˈpleɡiɡ] ‘you (pl.) will fold’
- No palatalization where [i] is derived
  ⑸ a. [ˈklɒɡe] ‘ladle’
    b. [ˈklɒɡiɡad] ‘ladleful’
- Proposed analysis:
  1. Underlyingly, ‘horses’ is /kiɛzəɡ/
  2. At the stem level, it is parsed as [kjɛzəɡ] to avoid hiatus
  3. Palatalization fails to apply because it is only allowed by nuclear [i]: *[ʧjɛzəɡ]
  4. And coalescence is disallowed at the stem level
  5. At the word level, both [k] and [ʧ] become [h]
- Word-level mutation-triggered mappings
  - /ʧiː/ → [ˈhiː]
  - /kjɛzəɡ/ → [ˈhjɛzəɡ]
  - Just as [kriːb] ‘comb’ becomes [mə ˈhriːb̥] ‘my comb’

Stratal aspects cont’d

- What about unmutated ‘horses’?
- It comes out of the stem level as [kjɛzəɡ]
- At the word level, /kj/ should be allowed to coalesce to [ʧ]
  Correct
  ⑺ a. [ˌlasˈtikən] ‘rubber band’
    b. [ˈlastiʧəw] ‘rubber bands’
- Plenty of other evidence for coalescence at the word level with non-dorsals

Spirantization: the phonology

- It looks like subtraction, but I suggest it is additive
- MAX(C-man) forces coalescence
- But DepLink(C-man, [cl]) outranks MAX([cl])
- There is a link between the surface correspondents of C-man₁ and [cl]₂, which gives the violation
- No need for MAXFLOAT
Spirantization: the morphology

- Restricted spirantization: only [k] and [ʧ] are affected, although floating C-man could do similar damage elsewhere (indeed we shall see it does)
- The floating C-man has to come in at the word level, because the distinction between [ki] and [kiV] is erased in its output
- Floating C-man is a word-level morphological element which subcategorizes (Paster 2006; Bye 2007; Yu 2007) just for [k ʧ] at the point of lexical insertion
- We expect the mutation to be morphologically restricted
  - Correct: “the definite and indefinite articles cause restricted spirantization only for [masc sg], [masc pl -anim], [fem pl]”
  - This looks like agreement that kicks in when definite has a value

Full spirantization: the morphology

- Triggered by possessive clitics
- Rather similar process, but:
  - Adds voicing (also subtractive) to the mix for [p t] ⇒ floating C-man and C-lar
  - No spirantization of [b d] ⇒ no floating features at all
  - [hr] → [r] seems kind of unrelated
- Massive subcategorization at point of insertion
- Also keeps the [hs]/[hjs] contrast
- Should also be morphological and word-level
- Proposal: agreement morphemes in the presence of a possessor
- Corroboration: some dialects lose full spirantization (possessor agreement) even as restricted spirantization (definiteness agreement) remains extremely vital

Lenition: the phonology

- Voiceless stops become voiced: [p t ň k] → [b d ňʤ g]
  - Floating C-lar, with a DefLink solution
- Voiced stops spirantize (chain shift): [b g] → [v h]
  - Floating C-man
  - But [d] and [ʤ] are unaffected
- Although [m] and [ʧ] are not: [m ň] → [v ŋ]

Lenition: stratal aspects

- Lenition must be postlexical
- Reason: there is a “failure of lenition” following obstruents
  (8) Lenition
  a. [ˈkoːz̥] ‘old’
  b. [o ˌɡaːdər ˈɡoːz̥] ‘an old chair’
  c. [on ˌiːli ˈɡoːz̥] ‘an old church’
  d. *[on ˌiːlis ˈɡoːz̥]
- To make a long story short...
  - The floating C-lar docks to a preceding consonant instead of the following one, creating a domain for [vcl] spreading
Failure of lenition: the autosegmental analysis

Crucially, the process can only apply when there is word concatenation, i.e. it is postlexical.

Stratal aspects of lenition I

The behaviour of [dʒ] corroborates this stratal insight

- In principle, [dʒ] can be underlying or derived from [ɡ] via palatalization
- In lenition, [dʒ] → [dʒ] but [ɡ] → [h]
- We could expect that different types of [dʒ] could behave differently in lenition
- For instance, [dʒ] → [h] before [i y]

Stratal aspects of lenition II

(9) Potential underlying /qiːr/ for [dʒiːr] ‘word’ (Welsh gair)

a. ['dʒiːr] ‘word’
b. [i 'dʒiːr] ‘his word’
c. *[i 'hiːr]

- Or [dʒ] → [hj]
- These patterns are unattested
- Mysterious under a standard approach
- Explained in stratal terms: the distinction between /dʒ/ and potential /qi/ is obliterated by lower levels, so when lenition comes in postlexically, it does not have access to that information
- Further support for postlexical affiliation: Pyatt (2003) — lenition sensitive to prosodic structure

Unanswered questions

- Lenition is postlexical, so it is difficult to ascribe it to some morphology
- But it does seem to involve subcategorization, like the morphological process of spirantization
- So where in the syntax do the floating bits of phonology come from?
  - Random lexical items: this would require multiple trigger allomorphs differing only in the mutation-causing material
  - Some morphosyntactic conditioning: some solution à la spirantization may be possible
- Similar conundrum to the Welsh “direct object mutation”
Mutations in Bothoa Breton are mostly amenable to straight phonological analyses

Although some subcategorization appears inevitable

Stratal computation coupled with substance-free representations gives us substantial mileage with fairly standard OT devices

Still, some of the lenition cases appear to lack clear morphosyntactic motivation — not for the first time

Trugarez!

Thank you!


