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 mbarii]	'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)
- Hamp (1951); Ellis (1965); Albrow (1966); Rogers (1972); Ó Dochartaigh (1978); Ewen (1982); Lieber (1983, 1987); Ball & Müller (1992); Swingle (1993); Grijzenhout (1995); Hannahs (1996, 2011); Kibre (1997); Pyatt (1997, 2003); Wolf (2005, 2007); Green (2006, 2007); Cyran (2010)
- The phonology can be tricky
  - Chain shifts (e. g. Irish [p] → [f], [f] → ∅)
  - Funky changes (Irish [dʲ] → [j] even as [bʲ] → [vʲ])
  - Unnatural classes (Welsh [m] → [v] but not [n] → [ð])

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"

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 Tautomorphemic Docking: decidedly non-modular

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

Bothoa Breton consonants

See the appendix for the featural structures I propose

Manner	Labial	Coronal	Postalveolar	Palatal-labial	Palatal	Dorsal	Glottal
Stops	p b	t d				k g	
Affricates			ʧ ʤ				
Fricatives	f v	s z	ʃ ʒ				h
Nasals	m	n			ɲ̃		
Laterals		l					
Rhotics		r					
Approximants	w			ɥ	j		

Mutations: lenition

Process	Voicing					Spirantization			Deletion		No change							
Unmutated	p	t	ʧ	k	hr	b	m	g	gw	dʒɥ	d	dʒ	f	v	s	z	ʃ	ʒ	h	n
Lenited	b	d	dʒ	g	r	v	v	h	w	v	d	dʒ	f	v	s	z	ʃ	ʒ	h	n

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

Mutations: spirantization

Process	Voicing		Fission	Spirantization					
Unmutated	p	t	ʧ{ɛ ø a}	k	ʧ{i y}	ʧɥ	kl	kr	kw
Spirantized, phonological	v	z	hj	h	h	hɥ	hl	hr	hw
Spirantized, phonetic	⟦v⟧	⟦z⟧	⟦ç⟧	⟦h⟧	⟦h⟧	⟦ʰɥ⟧	⟦l̥l⟧	⟦r̥⟧	⟦w̥⟧

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

Mutations: provection

	Devoicing									Prefixation of [h]					
Unmutated	b	d	dʒ	dʒɥ	g	gw	v	z	ʒ	V	j	w	l	m	n
Provected, phonetic	⟦p⟧	⟦t⟧	⟦ʧ⟧	⟦ʧɥ⟧	⟦k⟧	⟦kw⟧	⟦f⟧	⟦s⟧	⟦ʃ⟧	⟦hV⟧	⟦ç⟧	⟦w̥⟧	⟦l̥l̥⟧	⟦m̥m⟧	⟦n̥n⟧
Provected, phonological	p	t	ʧ	ʧɥ	k	kw	f	s	ʃ	hV	hj	hw	hl	hm	hn

- Basically, you devoice obstruents and prefix [h] to sonorants and vowels

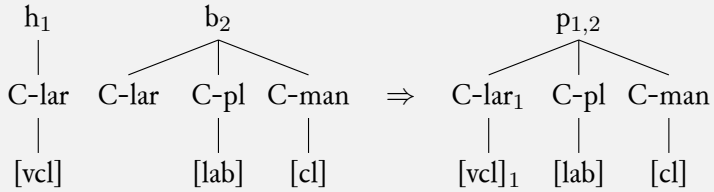
Provection

(2)	a.	(i)	[ˈmaːb̥]	son
		(ii)	[[o ˈm̥maːb̥]]	your (pl.) son
		(iii)	[o ˈhmaːb̥]	
	b.	(i)	[ˈalve]	key
		(ii)	[o ˈhalve]	your (pl.) key
	c.	(i)	[ˈbrøːr]	brother
		(ii)	[o ˈprøːr]	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

Provection: the autosegmental analysis



- Violated constraints: Max(C-lar), DepLink(Rt, C-lar), DepLink(Rt, [vcl])
- Highly ranked constraints: whatever causes the coalescence, MaxLink(Rt, [vcl])
- So far, so good

Spirantization: the explananda

- There are actually two types of spirantization
  - One affects only [k] and [ʧ], morphologically restricted
  - Another one gives the full package, associated with random lexical items
- Why the morphological restriction?
- Why the different behaviour of [ʧ] before [i y] contra [ɛ ø a]?
- Stratal OT to the rescue!

Detour: stratal aspects of palatalization I

- Unlike other Breton dialects, Bothoa shows a process of palatalization
- /k g/ → [ʧ ʤ] / _ 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 tautomorphemic [ki gi ky gy] (with one exception — it's OK, stem-level rules have exceptions; Bermúdez-Otero forthcoming)
  - No palatalization before word-level suffixes:

(4) a. ['burkiz̥] 'village population'
b. ['pleːgid̥] 'you (pl.) will fold'

  - No palatalization where [i] is derived

(5) a. ['klɒːge] 'ladle'
b. ['klɒːgiad̥] 'ladleful'

What about [hj]?

(6) a. ['ʧɛzəǧ] 'horses'
b. [mə 'hjɛzəǧ] 'my horses'

- Proposed analysis:
  1. Underlyingly, 'horses' is /kiɛzəg/
  2. At the stem level, it is parsed as [kjɛzəg] to avoid hiatus
  3. Palatalization fails to apply because it is only allowed by nuclear [i]: *[ʧjɛzəg]

☞ And coalescence is disallowed at the stem level

  4. At the word level, both [k] and [ʧ] become [h]

☞ Word-level mutation-triggered mappings

  - /ʧiː/ → ['hiː]
  - /kjɛzəg/ → ['hjɛzəǧ]
  - Just as [kriːb] 'comb' becomes [mə 'hriːb̥] 'my comb'

Stratal aspects cont'd

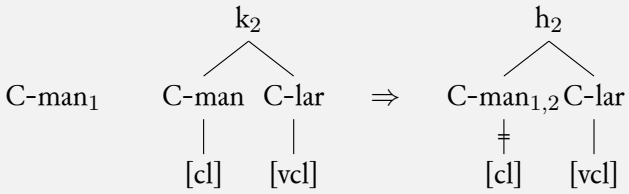
- What about unmutated 'horses'?
- It comes out of the stem level as [kjɛzəg]
- At the word level, /kj/ should be allowed to coalesce to [ʧ]

☞ Correct

(7) a. [ˌlasˈtikən] 'rubber band'
b. ['lastiʧəw] '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-man$_1$ 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 [h]/[hj] 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 ʧ k] → [b d ʤ g]

☞ Floating C-lar, with a DEPLINK solution

- Voiced stops spirantize (chain shift): [b g] → [v h]

☞ Floating C-man

- But [d] and [ʤ] are unaffected
- Although [m] and [r̥] are not: [m r̥] → [v r]

Lenition: stratal aspects

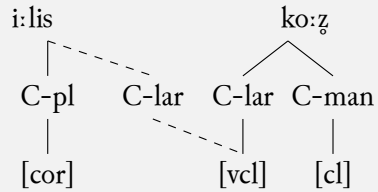
- Lenition must be postlexical
- Reason: there is a "failure of lenition" following obstruents

(8) Lenition

a.	['koːz̥]	'old'
b.	[o ˌgaːdər 'goːz̥]	'an old chair'
c.	[on ˌiːlis 'koːz̥]	'an old church'
d.	*[on ˌiːliz 'goːz̥]	

- 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 [g] via palatalization
- In lenition, [dʒ] → [dʒ] but [g] → [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 /gi:r/ for [dʒi:r] 'word' (Welsh *gair*)

a.	['dʒi:r]	'word'
b.	[i 'dʒi:r]	'his word'
c.	*[i 'hi:r]	

- Or [dʒ] → [hj]
- These patterns are unattested
- Mysterious under a standard approach
- Explained in stratal terms: the distinction between /dʒ/ and potential /gi/ 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"

Conclusion

- 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!

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