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Feature geometry meets contrastive specification: incomplete neutralization reloaded

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18vet Emgav Fonologiezh Manchester (18mfm)
20 a viz Mae 2010
Skol-Veur Manchester

So, “final devoicing”?

► The schoolbook analysis of final devoicing: [+voice]→[−voice]/_/# or somesuch
► A significant number of phonetic studies claim that word-final laryngeal neutralization is in fact incomplete, cf. especially Port & Leary (2005)
► Fourakis & Iverson (1984): neutralization is normally complete, incomplete neutralization is an artefact of lab conditions
► Supported: study of Afrikaans by van Rooy et al. (2003), complete neutralization in natural speech, disambiguation in the lab

Incomplete neutralization in phonetics and phonology

► Van Oostendorp (2008): where/if incomplete neutralization is real, the subtle phonetic differences reflect a difference in phonological representations
► All well and good, but is there robust phonological evidence for incomplete neutralization?
► And might it give us insights into what sort of phonological representation we are talking about?
► As you might have guessed, my answer is yes and yes
What are we looking for?

- “Phonetic” incomplete neutralization of laryngeal contrasts often involves vowel and consonant length
- Specifically, (underlyingly) voiced consonants are associated with longer preceding vowels, and vice versa
- We might expect this tendency to be phonologized
- So, we are looking for languages with
  - Phonological distinction between long and short vowels
  - Final devoicing
  - Phonetic relationship between vowel length and laryngeal features

Vowel lengthening in Friulian

- Data from Baroni & Vanelli (2000)
- Unstressed vowels are short; stressed vowels are normally short:

(3) a. [a’mi] ‘friend’
    b. [mêt] ‘(s)he puts’
    c. [can’tade] ‘sung (fem.)’
    d. [gust] ‘taste’
    e. [maŋ] ‘hand’
    f. [’bratf] ‘arm’

A priori expectations

- Laryngeal change may feed vowel change

<table>
<thead>
<tr>
<th>Rule</th>
<th>/aːd/</th>
<th>/at/</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Devoicing</td>
<td>/at/</td>
</tr>
<tr>
<td></td>
<td>Vowel shortening</td>
<td>/at/</td>
</tr>
</tbody>
</table>

- Complete neutralization, not really interesting for the purposes of this talk
- Laryngeal change may counterfeed vowel change

<table>
<thead>
<tr>
<th>Rule</th>
<th>/aːd/</th>
<th>/at/</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>Vowel shortening</td>
<td>/at/</td>
</tr>
<tr>
<td></td>
<td>Laryngeal change</td>
<td>/at/</td>
</tr>
</tbody>
</table>

- Incomplete neutralization
- Opacity?

Vowel lengthening in Friulian

- Stressed vowels can be long:

(4) a. [vi:f] ‘alive’ (masc.) _C#
    b. [spɔ:rk] ‘dirty (masc.)’ _r
    c. [’neri] ‘black’

- Minimal pairs: final syllables before single consonants:

(5) a. (i) [lat] ‘gone (masc.)’
    (ii) [val] ‘(it is) worth’
    b. (i) [lat] ‘milk’
    (ii) [val] ‘valley’

- Generalization: the vowel before an obstruent is lengthened if the obstruent is underlyingly voiced

(6) a. [lade] ‘gone (fem.)’
    b. [la’ta] ‘to milk’
Phonological redux

- In final stressed syllables, vowel length is distinctive in one position, namely before [l]
- There is also distinctive length in non-final syllables
- Otherwise, length is predictable
- Final devoicing opacifies lengthening (assuming it is not shortening...) but provides cues for disambiguation
- In a sense, then, Friulian is like any “incomplete neutralization” language writ large

Friulian: summary

- Phonological contrast between long and short vowels in final syllables
  - I assume lengthening before word-medial voiced stops is phonetic (a correlate of stress?), but distinct from phonological lengthening-as-bimoraicity; cf. D’Imperio & Rosenthal (1999); Krämer (2009) for Italian
- The consonantal representations of voiceless and devoiced obstruents are distinct: underlying /lad/ is surface /laːd/ and /lat/ is /laːt/
- Analysis further on

Breton

- Work in progress
- Significant dialectal variation
- Jackson (1953), “new quantity system” in Proto-Brythonic: stressed vowels are (mostly) short before voiceless obstruents and all types of clusters, long otherwise
- In Welsh, this remains a strong synchronic generalization, though minimal pairs exist, and dialectal variation runs amok (Wells, 1979; Awbery, 1984)
- Breton: different story, various incarnations: Falc’hun (1951); Kervella (1946); Jackson (1960); Carlyle (1988)
Length in Breton: the big picture

- Here: dialect of Plougescant (Trégorrois dialect group), described by Jackson (1960); Le Dû (1978)
- Vowels and sonorants may be long or short
- Voiced obstruents can only be short
- Voiceless obstruents may be long or short
  Le Dû (1978) does not note length differences in consonants.

Vowels and sonorants may be long or short
- Voiced obstruents can only be short
- Voiceless obstruents may be long or short

Length in Breton: final devoicing

- If final devoicing were a change from voiced to voiceless, we thus expect it to shorten the preceding vowel
- This is disconfirmed:

  (10) a. ['toge] ‘hats’
  b. ['tork] ‘hat’

- Underlying voiceless obstruents word-finally are long:

  (11) a. ['kas] ‘send!’
  b. ['kas] ‘cat’
  c. k[a:]xe ‘female cat’
  d. *['kas]

Final devoicing: sandhi

- The traditional description of sandhi: all obstruents are voiced before sonorants and voiced obstruents (Stephens, 1993; Favereau, 2001)
- Devoicing sandhi (Krämer, 2000; Hall, 2008): a different story
- The real picture seems to be significant variation: inconsistent transcriptions in texts; explicit statements to the effect of “sometimes it happens and sometimes it doesn’t” (Wmffre, 1998); “weak voicing” and suchlike
- Work in progress: it seems that sandhi voicing can be partial, especially in a vowel-sonorant context
Breton: summary

- Vowel length cues underlying voicing in final position
- Phonetically there also seems to be incomplete neutralization
- Essentially the same conclusion as for Friulian: the output of final devoicing is a third category


\[
\begin{array}{c|c|c}
\text{Lar} & \text{Lar} & [F] \\
\times & \times & \times \\
\end{array}
\]

No specification  Contrastive non-specification  Contrastive specification

- Assuming a difference between an empty node and lack of node
- Markedness/faithfulness constraints may refer to either nodes or features
- Substance-free (Morén, 2003; Blaho, 2008): [F] can be whatever you need for this particular language
- Presence of nodes associated with contrastive specification à la Toronto
- Thus: no node = no contrast
Friulian: good old-fashioned analysis

- Voiceless obstruents are underlyingly moraic, voiced ones aren’t
- Head foot must be bimoraic
- Weight-by-Position for laryngeally specified coda segments
  - Laryngeally unspecified segments are not moraic by TETU
  - [F] in Friulian is [voiceless] (Blaho, 2008):
    - Markedness = structure.
    - De Lacy (2006): whatever is preserved is more marked, neutralization is to less marked
- Final devoicing: deletion of [Lar] but preservation of [vcl]

Friulian: OT analysis

- MAIN-TO-WEIGHT (Bye & de Lacy, 2008): stressed syllables are bimoraic
- Constraints on weight following Morén (2001)
  - *µ[seg]: certain segment types cannot be moraic
  - MAX-µ: do not delete morae
  - DEP-µ: do not insert morae
  - MAXLINK-µ[seg]: do not delete moraic associations (for certain segment types)
  - DEPLINK-µ[seg]: do not insert moraic associations (for certain segment types)
- I propose: WEIGHT BY POSITION[Lar]: coda segments with a Lar node should be moraic (a variety of Morén’s “BeMORAIC”)

No lengthening in /at/

- Final devoicing driven by *Lar/\[Wd (whatever...)
- Obstruent projects a mora
- Final [vcl] is protected by MAX[vcl]

No lengthening in /at/: OT analysis

- Loss of laryngeal contrasts impossible, so WbP decides
Lengthening in /ad/

▶ In the case of /ad/, final devoicing must happen
▶ Final devoicing creates segments with no Lar node, so WbP(Lar) is inactive, and there is no reason for $V_{\mu}C_{\mu} \Rightarrow$ lengthening

\[ \text{Ft} \]
\[ \mu \quad \mu \]
\[ \text{a} \quad \text{t} \]
\[ \text{Lar} \]

Residual issues

▶ Richness of the Base:
  ▶ Voiced moraic obstruents: taken care of by markedness over faithfulness, WbP inactive since FS is surface-true
  ▶ Voiceless moraic obstruents also surface correctly
  ▶ Moraic Lar-less obstruents ruled out by $*_{\mu}\text{obst}\gg\text{MAX}_{-\mu}$
▶ Distinctive length before /l/: underlyingly moraic and nonmoraic /l/
  ▶ Underlying nonmoraic /l/ behaves like the Lar-less obstruents
  ▶ Makes sense if Lar is redundant and thus absent from the representation
▶ The final nasal [n] (presumably glottal/placeless; de Lacy, 2006) is always moraic: undominated WbP[nasal]
▶ Coda [r] is always nonmoraic (?): Pandora’s box

Lengthening in /ad/: OT analysis

<table>
<thead>
<tr>
<th>Lad</th>
<th>MtW</th>
<th>$*_{\mu}\text{cons}$</th>
<th>WbP(Lar)</th>
<th>$*_{\text{Lar}}$/wd</th>
<th>MAX(Lar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$la_{\mu}d$</td>
<td>$*_{\mu}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>$la_{\mu\mu\mu}d$</td>
<td></td>
<td>$*_{\mu}$</td>
<td>$*_{\mu}$</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>$la_{\mu\mu\mu}d$</td>
<td></td>
<td>$*_{\mu}$</td>
<td></td>
<td>$*_{\mu}$</td>
</tr>
<tr>
<td>d.</td>
<td>$e_{\mu}la_{\mu\mu\mu}d$</td>
<td></td>
<td></td>
<td>$*_{\mu}$</td>
<td></td>
</tr>
</tbody>
</table>

▶ There is no constraint that could force a mora to surface on the Lar-less devoiced obstruent
▶ The extra structure effectively licenses moraicity; high-ranking $*_{\mu}\text{cons}$ (or $*_{\mu}\text{obst}$) is necessary anyway to prevent gratuitous mora insertion

Residual issues

▶ Further evidence for final voiceless obstruents as moraic: Italian borrowings (Baroni & Vanelli, 2000):

(12) a. (i) [a'fit] ‘rent’ (It. affitto)
   (ii) [afi'tut] ‘small rent’

b. (i) [impje'ga:t] ‘clerk’ (It. impiegato)
   (ii) [impjegade] ‘female clerk’ (It. impiegata)

▶ Non-final stress: bisyllabic foot, WbP inactive anyway
▶ Final affricates: for further research
Friulian: conclusion

▶ Crucial difference: underlying voiceless stops can surface as moraic, underlying voiced stops cannot
▶ Proposed analysis: voiceless obstruents have most structure which allows them to hold on to morae, voiced ones lose structure

The analysis is similar to that of Hualde (1990), but does not rely on opacity or compensatory lengthening. Also affinities with the analysis of Milanese by Prieto i Vives (2000)
▶ Obvious affinities with what de Lacy (2006) says about “markedness”
▶ But the markedness relations follow from the structure rather than being stipulated by fiat

Cursory analysis of Breton I

▶ Work in progress
▶ Recall that voiceless obstruents can geminate but voiced ones cannot
▶ True voiceless obstruents shorten preceding vowels, devoiced ones do not
▶ Same representations as for Friulian
▶ Additional observation: distribution of voiceless obstruents very restricted
▶ Essentially initial syllables, stressed syllables and sometimes word-final position (but not as a result of final devoicing)

Further argument for [voiceless]

Cursory analysis of Breton II

▶ ⟨Lar⟩ obstruents lose laryngeal specification and cannot license morae, vowel lengthens because of MAIN TO WEIGHT: /ad/ → /a*:µµd/
▶ ⟨Lar,[vcl]⟩ obstruents stay put and license morae, so no lengthening: /at/ → /aµµt:
▶ Word-medially voiceless obstruents become moraic in order to be parsed into the stressed syllable and survive the markedness constraint

Cursory analysis of Breton III

▶ Hopefully you get the picture
▶ In Breton, the drive is to save the marked feature by trying to parse it in a positional-faithfulness position
Why is this useful empirically?

- It is widely acknowledged that ternary contrasts in laryngeal phonology are a genuine problem for privative-feature theories (Wetzels & Mascaró, 2001)
- My aim here is to show that feature geometry is not just a formal gimmick to save the theory but gives us genuinely interesting ways to analyze the patterns
- Phonetic ternary contrasts: Taiwanese (Hsu, 1998)
- More phonological cases:
  - Help?
  - One claim is that Modern German has lengthening before word-final ‘lenes’, and it’s a final-devoicing language...
  - ... but see Seiler (2009) on why this isn’t (primarily) a question of laryngeal features

More empirical usefulness

- If the accounts of final devoicing presented here are correct, this allows us to reconcile two existing claims
  - FD is weakening or loss of structure (Harris, 2009)
  - “FD” is nonassimilatory addition of structure (Iverson & Salmons, 2007)
- Note that Breton has both phonological devoicing-as-weakening and imposition of a [vel] feature in some morphological contexts, best analyzed as mora affixation (cf. Trommer & Zimmermann this conference)
- Finally, at least in Breton word-final obstruents seem to be phonologically underspecified for laryngeal features: consistent with Keating (1988)

Feature geometry vs. markedness hierarchies I

- De Lacy (2006) argues forcefully against representational approaches to markedness
- Much of his criticism is to the point, but much is an attack on the cross-linguistic validity of markedness statements (“Coronal is universally unmarked” vs. “Velar is universally unmarked”)
- Way out: markedness hierarchies
- These are also supposed to be universally valid, which is empirically problematic
- Here: feature geometry + substance-free phonology = theory of markedness effects

Feature geometry vs. markedness hierarchies II

- I accept the insights of de Lacy (2006) on effects such as markedness reduction, conflation and preservation (what he calls the xo Theory)
- But I reject his insistence on the universality of featural representations and markedness relationships
- Many languages clearly need a [voice] feature rather than [voiceless]. The markedness effects should still be valid within a language (e. g. devoicing as loss of [voice] and consequent neutralization with (Lar) is still markedness reduction)
Stringent constraint violations: markedness

<table>
<thead>
<tr>
<th>*Root</th>
<th>*Lar</th>
<th>*[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>⟨×⟩</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⟨×, Lar⟩</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>⟨×, Lar, [voi]⟩</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Stringent constraint violations: faithfulness

<table>
<thead>
<tr>
<th>⟨×, Lar, [voi]⟩</th>
<th>MAX[Root]</th>
<th>MAX[Lar]</th>
<th>MAX[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>∅</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>⟨×⟩</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>⟨×, Lar⟩</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>⟨×, Lar, [voi]⟩</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Substance-free markedness

- Essentially a Trubetzkoyan approach: markedness is merely the presence of structure
- More empirically adequate: the hypothesis is that given a proper theory of how features are assigned, it is possible to account for the patterns without stipulations on substantive markedness hierarchies...
- ...and preserve the advantages of xo Theory
- Hypothesis: features are assigned on the basis of phonological activity (Dresher, 2009, and many more)
- Language-internal versus cross-linguistic markedness

Unanswered questions so far

- Where do the empty nodes come from?
- Where does the difference between node-less and feature-less segments come from?
- How can one reconcile this representational proliferation with the avowed minimalist perspective?
- Proposal: feature geometry is a way to capture the generalization that only distinctive feature specifications are phonologically active (Dresher, 2009)
- Presence or absence of node makes the difference between contrastive non-specification and redundant non-specification (hence absent features)
Feature geometry as successive division I

- If feature \([F]\) is contrastive for a subset of the inventory, then the subset is further divided into two subsets
- Those features which receive \([F]\) also receive the node it is associated with
- The complement of the set of \([F]\) segments receives the node but not the feature
- Similar proposals: Ghini (2001a,b)
- Given standard autosegmental assumptions, this derives the generalization that only segments contrastively specified for a feature are active in phonological processes involving that feature

Wrap-up

- Final devoicing in Friulian and Breton involves a ternary contrast, and thus phonological incomplete neutralization
- Proposed account in terms of feature geometry with privative features
- Advantages:
  - Less stipulative account of markedness hierarchies
  - Reconciliation of contrastive specification with feature geometry
  - Feature geometry is not just a way to “get” ternary effects
  - All very programmatic, but I believe it is a reasonable set of initial assumptions
- Further questions
  - Does the phonetic account of Breton hold up? (In progress)
  - Can we dispense with tiers and have features depend on features (Blaho, 2008)?
  - Does this thing work at all?

References I

References II


References III


References IV


References V


References VI


References VII


References VIII


