Mutation: Morphology by Feature Modification

(1)

**V Quality:** Bruder ‘brother’ \(\sim\) Brüder ‘brothers’ (German)

**C Quality:** dastah ‘to dig’ \(\sim\) nastah ‘I dig’ (Texistepec Popoluca)

**V Length:** gudù ‘walk’ \(\sim\) gudù: ‘walking’ (Hausa)

**C Length:** katai ‘hard’ \(\sim\) kattai ‘hard!’ (Shizuoka Japanese)

**Tone:** gwè ‘swam’ (Sc) \(\sim\) gwé ‘swam’ (Pt) (Ngbandi)

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Two Major Models of Mutation

**A. Cyclic Feature Transformation:** Mutation is triggered by morphological rules (constraints) which execute (require) feature changes

<table>
<thead>
<tr>
<th>Morphology</th>
<th>Phonology</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\hat{V}) [N +plural] (\rightarrow) [−back]</td>
<td>−</td>
</tr>
<tr>
<td>Brüder</td>
<td></td>
</tr>
</tbody>
</table>

**B. Cyclic Feature Concatenation:** Mutation is an effect of feature affixation + association of the feature affix to base material

<table>
<thead>
<tr>
<th>Morphology</th>
<th>Phonology</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\hat{V})N + [−back][+plural] (\rightarrow) (\hat{V})[−back]</td>
<td>(\hat{V})[−back] + [−back] (\rightarrow) (\hat{V})[−back]</td>
</tr>
<tr>
<td>Bruder + [−back]</td>
<td>(\Rightarrow) Brüder</td>
</tr>
</tbody>
</table>

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Mutation cum Segmental Affixation

(2)

**V Quality:** Buch ‘book’ \(\sim\) Büch-er ‘books’ (German)

**C Quality:** famar- été ‘small’ (C2) \(\sim\) pamar-o ‘small’ (C1) (Fula)

**V Length:** to ‘take’ \(\sim\) to:-ru ‘take’ (Pass.) (Tarahumara)

**C Length:** cam ‘eat’ (tr.) \(\sim\) camm-o ‘eat’ (intr.) (Päri)

**Tone:** tâdâ ‘boy’ \(\sim\) tâdâ-wa ‘boys’ (Kanuri)
Cyclicity in Morphology

Endocentric mutation

→ all examples so far ((1) and (2)) are endocentric:

- **German**: Stem \(\rightarrow [\text{-back}]\) \(\rightarrow\) PL
- **Päri**: Stem \(\rightarrow\) Lengthening \(\rightarrow\) ONTR
- **Kanuri**: Stem \(\rightarrow\) L-tone \(\rightarrow\) wapL

Directionality of Morphonological Processes

Endocentric:

\[ [\text{Prf}_2] \rightarrow [\text{Prf}_1] \rightarrow [\text{Stem}] \rightarrow [\text{-Suf}_1] \rightarrow [\text{-Suf}_2] \]

\(=_{\text{def}}\) A morphophonological process on a morphological constituent \(C\) is triggered by a constituent \(C'\) that is morphologically more peripheral than \(C\).

Exocentric:

\[ [\text{Prf}_2] \rightarrow [\text{Prf}_1] \rightarrow [\text{Stem}] \rightarrow [\text{-Suf}_1] \rightarrow [\text{-Suf}_2] \]

\(=_{\text{def}}\) A morphophonological process on a morphological constituent \(C\) is triggered by a constituent \(C'\) that is morphologically less peripheral than \(C\).

Where the Models Differ in Their Predictions

**Cyclic Feature Transformation**

→ All mutation is endocentric
  - Transformations are inherently cyclic base modifications

**Cyclic Feature Concatenation**

→ Mutation may be endocentric, exocentric, or mixed
  - Morphology: Every morpheme can introduce floating features
  - Phonology: Floating features may attach to any phonological object
Strict Base Mutation (SBM, Alderete 1999:141)

All mutation is endocentric.

Goal of this talk

- Show that SBM is empirically untenable (cf. Wolf 2009).
- Provide examples of exocentric mutation for different types of features (length, tone, segmental features).
- Present new formal types of counterexamples to the SBM.

Exocentric Mutation: Data

Exocentric stem-to-affix mutation in Kpelle

- tones: H, M, L, HL; TBU=σ
- 5 classes of nouns; class 2 and 5 have same surface tone pattern but affect following morpheme (affix/word) differently

(3)

<table>
<thead>
<tr>
<th>BASE</th>
<th>PL</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.H</td>
<td>wúlú</td>
<td>wúlú-&lt;num służ&gt;</td>
</tr>
<tr>
<td>L.L</td>
<td>yàlà</td>
<td>yàlà-&lt;num służ&gt;</td>
</tr>
<tr>
<td>L.HL</td>
<td>yòwò</td>
<td>yòwò-&lt;num służ&gt;</td>
</tr>
<tr>
<td>H.HL</td>
<td>yìlè</td>
<td>yìlè-&lt;num służ&gt;</td>
</tr>
<tr>
<td>L.L</td>
<td>gbònò</td>
<td>gbònò-&lt;num służ&gt;</td>
</tr>
</tbody>
</table>

(Konoshenko 2008:24)
**Analysis**

- plural affix is underlyingly low: /-yàà/; e.g. gbònò-yàà (cl.5)
- final HL-contour on N is simplified and L shifts to affix: yilé-yàà (cl.3+4)
- final H of N spreads to this affix: wúlú-yàà (cl.1)
- class 2 has a final floating H: gyàlà-yàà

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**Gà (Paster 2000, 2003)**

- Tense-Aspect is structurally inside of subject agreement

(4)

<table>
<thead>
<tr>
<th>1Sg-Prog-dig</th>
<th>1Sg-dig-Hab</th>
</tr>
</thead>
<tbody>
<tr>
<td>mí-n-cha</td>
<td>mí-cha-a</td>
</tr>
<tr>
<td>‘I’m digging’</td>
<td>‘I dig habitually’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3Sg-Fut-dig</th>
<th>3Sg-Perf-sing</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-baá-cha</td>
<td>é-llá</td>
</tr>
<tr>
<td>‘I will dig’</td>
<td>‘he has sung’</td>
</tr>
</tbody>
</table>

(Paster 2000:8, Paster 2003:32)

---

**Exocentric affix-to-affix mutation in Gà**

- tonal overwriting of TAM on AGR

(5)

<table>
<thead>
<tr>
<th>Habitual</th>
<th>Perfective</th>
<th>Simple Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Underlying H/L-Tone)</td>
<td>(Grammatical H)</td>
<td>(Grammatical L)</td>
</tr>
<tr>
<td>1Sg</td>
<td>mí-cha-a</td>
<td>mi-ðú</td>
</tr>
<tr>
<td>2Sg</td>
<td>ó-cha-a</td>
<td>o-ðú</td>
</tr>
<tr>
<td>(‘dig’)</td>
<td>(‘dig’)</td>
<td>(‘cultivate’)</td>
</tr>
</tbody>
</table>

(Paster 2003:28–30)

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**Interim summary: Simple cases of exocentric mutation**

- Kpelle: stem triggers mutation on more outwards affix
- Gà: affix triggers mutation on more outwards affix

(6) **Simple exocentric mutation: overview**
Endo- vs. autocentric mutation in Dhaasanac

- various morphological lengthenings (gemination/V-lengthening)
- plural for certain nouns formed by suffixation of /-an/ and gemination of a preceding stem consonant (7-a)
- restriction: no gemination in polysyllabic words
- if gemination is blocked for polysyllabic nouns, the afix surfaces with a long V (7-b)

(7) Base Pl
a. kur kuram ‘knee’
kór koram ‘double-pointed fork’
far faram ‘a kind of stick’
?ojo?of ?ojofoam ‘black’
deger degeram ‘barren’

(Tosco 2001:87)

Endo- vs. Exo-centric mutation in Tamil

- intransitivization marked by gemination of a stem-final C
  → endocentric mutation

(8)

 Trans.Stem Pst Intr.Stem Pst
uud(u)epenth uud-in- ‘blow’ uutt(u)epenth uutt-in- ‘pour’
tirumb(u)epenth tirumb-in- ‘return’ tirupp(u)epenth tirupp-in- ‘return’
surʊŋ(u)epenth surʊŋ-in- ‘shrink’ surukk(u)epenth surukk-in- ‘shrink’
uur(u)epenth uur-in- ‘ooze’ uutt(u)epenth utt-in- ‘pour’

(Sundaresan&McFadden 2014:2+3)
Endo- vs. Exo-centric mutation in Tamil

\[ \text{Stem} \rightarrow \text{\text{-}Intr} \rightarrow \text{\text{-}Past} \]

or

\[ \text{Stem} \rightarrow \text{\text{-}Intr} \rightarrow \text{\text{-}inPast} \]

→ Alternation between endo- and exocentric mutation

Analysis

- the intransitive lengthening strives to be realized as gemination of the following suffix
- for the V-initial PST-allomorph, gemination of a suffix-C is impossible: gemination of a stem consonant

Interim summary: Complex cases of exocentric mutation

(10) Complex mutation: overview

<table>
<thead>
<tr>
<th>Alternation</th>
<th>Tamil (length)</th>
<th>Dhaasanac (length)</th>
<th>Aymara (length)</th>
</tr>
</thead>
<tbody>
<tr>
<td>endo- vs. exo-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>endo- vs. auto-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exocentric blocking</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cyclic accounts restricted by SBM

1. Word and Paradigm Morphology (Anderson 1992)
2. Transderivational Antifaitfulness Theory (Alderete 1999)
3. Realize Morpheme (Kurisu 2001)
Cyclic accounts restricted by SBM

Cyclic Featural Transformations are Inherently Endocentric

Featural Concatenation may have Endocentric Effects...

Zimmermann&Trommer
Exocentric mutation
OCP 12

Cyclic accounts restricted by SBM

...or Exocentric Effects

Antifaitfulness (Alderete 1999)

1. transderivational faithfulness relations (Benua 1997): allow to compare (morphologically related) output forms

2. every standard faithfulness constraint exists in a negative version demanding unfaithfulness

transderivational antifaitfulness constraints demand unfaithfulness with respect to a certain phonological dimension that distinguishes two morphologically related words

Zimmermann&Trommer
Exocentric mutation
OCP 12
Antifaithfulness and endocentric mutation

(11) **Antifaithfulness analysis for endocentric mutation in Texistepec Popoluca**

<table>
<thead>
<tr>
<th></th>
<th>MAXS</th>
<th>IDENT-NAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>dastah + 1.Sg</td>
<td></td>
<td>￢OO-IDENT NAS[dastah]</td>
</tr>
<tr>
<td>a. dastah</td>
<td>&quot;!&quot;</td>
<td></td>
</tr>
<tr>
<td>b. astah</td>
<td>&quot;!&quot;</td>
<td>&quot;!&quot;</td>
</tr>
<tr>
<td>c. nastah</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Recall: exocentric mutation in Gã

(12) **TAM overwrites tone on the subject prefix**

<table>
<thead>
<tr>
<th></th>
<th>PERFECTIVE</th>
<th>SIMPLE PAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical H</td>
<td>Grammatical L</td>
<td></td>
</tr>
<tr>
<td>1Sg</td>
<td>mi-cha</td>
<td>mi-dú</td>
</tr>
<tr>
<td>2Sg</td>
<td>o-cha</td>
<td>o-dú</td>
</tr>
</tbody>
</table>

('dig') ('cultivate')

Zimmermann & Trommer

Antifaithfulness: no mutation on more peripheral affix

(13) **Antifaithfulness analysis for Gã?**

\[ \neg OO-\text{DEP}H \]

Perf-/cha/ [cha]  \[ \rightarrow \] incorrect prediction *[chá]*

- no antifaithfulness constraint indexed to Perf can ever enforce a change on a prefix (/mi-/ or /o-/)

Zimmermann & Trommer

Antifaithfulness and exocentric mutation

- Only a mutation can be demanded that distinguishes a morphologically more complex word from a less complex base

Zimmermann & Trommer
Cyclic accounts restricted by SBM

Antifaitfulness and SBM

(14) **Strict Base Mutation, illustrated (Alderete 1999:141)**

<table>
<thead>
<tr>
<th>Base</th>
<th>Derivative</th>
<th>¬OO-FAITH</th>
<th>OO-FAITH</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>ROOT-af</td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>root</td>
<td>root-AF</td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>

(capitalization: change/mutation)

(15) **Thesis of Strict Base Mutation (Alderete 1999:141)**

Transderivational Anti-Faithfulness may only affect the base of affixation.

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Predicting exocentric mutation in a GNA account

Generalized Nonlinear Affixation (=GNA)

- all mutation and non-concatenative morphology is the result of affixation (Lieber 1987, Bermúdez-Otero 2012, Trommer&Zimmermann 2015)
- a (nonlinear) morpheme may in principle affect the preceding or the following morpheme

(16) **Autosegmental analysis for mutation**

```
                      A
                     / \              
                    X   Z
St  ¬Af₁  ¬Af₀
```

---

Endocentric mutation: Texistepec Popoluca Mixtec and GNA

(17) **A GNA account for Texistepec Popoluca**

<table>
<thead>
<tr>
<th>[−nas]</th>
<th>[−nas]</th>
<th>[−nas]</th>
<th>[−nas]</th>
<th>[−nas]</th>
<th>Max[+nas]</th>
<th>*Floaṭ</th>
<th>Max[−nas]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>a.</td>
<td>d</td>
<td>a</td>
<td>s</td>
<td>t</td>
<td>a</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>d</td>
<td>a</td>
<td>s</td>
<td>t</td>
<td>a</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>d</td>
<td>ː</td>
<td>a</td>
<td>s</td>
<td>t</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

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Zimmermann&Trommer Exocentric mutation OCP 12 33 / 56

Zimmermann&Trommer Exocentric mutation OCP 12 34 / 56

Zimmermann&Trommer Exocentric mutation OCP 12 35 / 56

Zimmermann&Trommer Exocentric mutation OCP 12 36 / 56
Exocentric mutation: Gã and GNA (Simple Past)

<table>
<thead>
<tr>
<th>H</th>
<th>L</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>m₁</td>
<td>+</td>
<td>d u</td>
</tr>
</tbody>
</table>

*SPREADRIGHT τ \Rightarrow π \quad τ \Rightarrow π

a. H L H
m₁ d u

\[ \text{\textdegree} \]

b. H L H
m₁ d u

c. H L H
m₁ d u

τ \Rightarrow π:  Each tone must be associated phonetically
or morphologically to a prosodic unit

τ \Rightarrow π:  Each tone must be associated phonetically to a prosodic unit

Alternating mutation: Tamil and GNA

(18) Tamil and GNA

<table>
<thead>
<tr>
<th>µ</th>
<th>µ</th>
<th>µ</th>
</tr>
</thead>
<tbody>
<tr>
<td>o \text{\textdegree} \æ</td>
<td>+</td>
<td>nd₅</td>
</tr>
</tbody>
</table>

*FL \quad *V: \quad *SPRL \quad *C:

a. µ µ µ
u d + + n

b. µ µ µ
u d i n

c. µ µ µ
u d i n

(An undominated constraint preserves underlying vowel length)

Conclusion

Summary

- different types of mutation exist in the languages of the world which are not endocentric
- theories that are cyclic-transformational and hence restricted by the SBM suffer from a severe undergeneration problem
References

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