Consonant Mutation and Initial Prominence: The Historical Loss of Lexical Contrastiveness

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Note as of 2018: When I gave this presentation I had only recently begun studying Ferry’s materials on Bassari and Bedik. Since then I have come to realize that some of her analyses (repeated here) are somewhat misleading. There is in fact no ŋ̃~ɓ̃~m or ŋ̃~ŋ̃~ŋ series as she presents them, but rather ŋ̃~ɓ̃~m, ŋ̃~m~m, ŋ̃~ŋ̃, and ŋ̃~ŋ̃~ŋ̃. The series l~ɗ~n does indeed exist, but not in Bedik. The point of the presentation still stands regarding the loss of initial lexical contrastiveness, but the analogical changes that seemed to obliterate even more of these contrasts did not in fact take place.

Accurate mutation system of Bassari:

Grade I ʃ s f x x w x w r y ɣ y y ŋ̃ n ŋ̃ ŋ̃ ŋ̃ ɓ ɗ l y
Grade II p t c k kw b d j g g w m n ŋ ŋ ŋ ŋ w ɓ ɗ ɣ
Grade III p t c ng/k ngw/kw mb nd nj ng ngw m n ŋ ŋ ŋ ŋ w m n ŋ

Accurate mutation system of Bedik:

Grade I ʃ s f h hw w r y ɣ y m l ŋ ŋ ŋ ŋ w ɓ ɗ ɣ
Grade II p t c k kw b d j g g w m l ŋ ŋ ŋ ŋ w ɓ ɗ ɣ
Grade III p t c ng/k ngw/kw mb nd nj ng ngw m n ŋ ŋ ŋ ŋ w m n ŋ
Introduction

This presentation examines the historical development of initial consonant mutation in the Tenda languages (Northwest Atlantic: Senegal, Guinea), and what it tells us about the role of initial prominence.

I argue that initial prominence should not be seen as facilitating lexical contrasts, but simply phonemic contrasts, which may in fact be preferentially exploited for signaling grammatical (rather than lexical) information.

Consonant mutation systems involve alternations between two or more consonants, triggered by non-phonological factors (morphological or syntactic)

Examples from two Northwest Atlantic languages:

Kobiana  
  a-jjɛc  ‘heel’
  ga-zɛc  ‘heels’

Fula  
  ’o wind-i  ‘he wrote’
  ɓe mbind-i  ‘they wrote’
Consonant Mutation

Found most famously in Celtic, but also NW Atlantic, Mande, and (some) Bantu languages within Africa, also Austronesian, and others

- Usually stem-initial (Iosad 2010)

Discussions of initial prominence generally mention that the stem/root-initial position is best for signaling lexical contrasts

But initial mutation can (and in general does) limit the possible lexical contrasts in initial position, using these contrasts to instead signal grammatical information

For example, /x/ and /q/ in Sereer (NW Atlantic):

nax ‘tell story’ vs. naq ‘scoop up’ lexically contrastive

xaŋ ‘yam’ vs. a-qaŋ ‘yams’ grammatically contrastive
The Tenda Languages

Today we’ll examine the Tenda languages (Northwest Atlantic)
  • Basari (ɑ-níyàn)
  • Bedik (mui-ník)
  • Konyagi (wæ-mèỹ)

In these languages, less than half of the consonant phonemes are lexically-contrastive stem-initially

Their systems of initial consonant mutation instead exploit many phonemic contrasts to signal grammatical information
  • Noun class (including singular/plural) in nouns, tense/aspect in verbs

By exploring the historical development of mutation in Tenda, we will see how in stem-initial position, signaling grammatical information has become preferred to signaling lexical information
The Tenda Languages

The Tenda languages are part of the Northwest Atlantic family
  • Spoken in Senegal and Guinea

Sources: Ferry’s (1991) *Thesaurus Tenda*, and Santos’ (1996) grammar of Konyagi

Initial consonant mutation is a prominent areal feature in the region
  • Arose independently in branches of NW Atlantic, as well as some Mande
Overview of Tenda mutation

Konyagi:

I (Lenis)  f  r  s  x  w  l  y  y/w  ŵ  l̰  ỹ  ỹ/ŵ  v  ry  y

II (Fortis)  p  t  c  k  b  d  j  g  m  n  ŋ  ŋ  ŋ  ŋ

III (Nasal)  p  t  c  k  mp  nt  nc  nk  m  n  ŋ  ŋ  mb  nd  nj

Bedik:

I (Lenis)  f  s  ş  h  w  r  y  ŋ  b  l  y̍  ŋ

II (Fortis)  p  t  c  k  b  d  j  g  ŋ  ḍ  ŋ  ŋ

III (Nasal)  p  t  c  ng  mb  nd  nj  ng  m  n  ŋ  ŋ

Basari:

I (Lenis)  f  s  ş  x  w  r  y  ŋ  ŵ  l̰  ỹ  ŋ

II (Fortis)  p  t  c  k  b  d  j  g  ŋ  ḍ  ŋ  ŋ

III (Nasal)  p  t  c  ng  mb  nd  nj  ng  m  n  ŋ  ŋ

Different morphological constructions call for a particular mutation grade of the root-initial consonant

Note: this ignores the labiovelar series in Konyagi, arising from velars next to round vowels
Overview of Tenda mutation

Konyagi:

I (Lenis) f r s x w l y y/w w ọ ẹ ẹ/w v ry y
II (Fortis) p t c k b d j g m n ŋ ŋ b d ɗ y
III (Nasal) p t c k mp nt nc nk m n ŋ ŋ mb nd nj

Bedik:

I (Lenis) f s ʃ h w r y y b l ọ ẹ y
II (Fortis) p t c k b d j g b d ɗ y
III (Nasal) p t c ng mb nd nj ng m n ŋ ŋ

Basari:

I (Lenis) f s ʃ x w r y y ŋ ọ l ọ ẹ ẹ
II (Fortis) p t c k b d j g b d ɗ y
III (Nasal) p t c ng mb nd nj ng m n ŋ ŋ

Different morphological constructions call for a particular mutation grade of the root-initial consonant
Nominal mutation (noun class)

Bedik noun class system:

<table>
<thead>
<tr>
<th>sg.</th>
<th>pl.</th>
<th>sg.</th>
<th>pl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ā-I</td>
<td>ɓʌ̄-I</td>
<td>gá-III</td>
<td>bá-III</td>
</tr>
<tr>
<td>Ø-I</td>
<td>mā-III</td>
<td>ɛ́-II</td>
<td>mā-III</td>
</tr>
<tr>
<td>é-II</td>
<td>mā-I</td>
<td>é-II</td>
<td>ɔ́-I</td>
</tr>
<tr>
<td>gé-III</td>
<td>bé-III</td>
<td>ɔ́-I</td>
<td>mā-III</td>
</tr>
<tr>
<td>ŋá-III</td>
<td>bé-III</td>
<td>gó-III</td>
<td>bó-III</td>
</tr>
</tbody>
</table>

sg. ~ pl. examples:

<table>
<thead>
<tr>
<th>grades</th>
<th>sg.</th>
<th>pl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>II~I</td>
<td>ɛ́-dōl</td>
<td>mā-rōl</td>
</tr>
<tr>
<td>I~III</td>
<td>fāká</td>
<td>mā-pāká</td>
</tr>
<tr>
<td>II~III</td>
<td>ɛ́-gāf</td>
<td>mā-ngāf</td>
</tr>
</tbody>
</table>
Nominal mutation (noun class)

Change of noun class (Bedik):

(grade III)  gá- njámbāl  ‘Néré tree’
(grade I)  ó-yámbāl  ‘Néré wood’

An example from Basari:

(grade I)  a-liyàn  ‘Basari person’
(grade II)  ɛ-dīyàn  ‘laterite stone’
(grade III)  a-níyàn  ‘Basari language’

Adjectives agree in noun class, and thus show all three grades (exs. from Bedik):

-wārā ~ -bārā ~ -mbārā  ‘red’
-rōmā ~ -dōmā ~ -ndōmā  ‘short’
-ȳ̀r ~ -j̄̀r ~ -nj̄̀r  ‘dry’
**Mutation in the verbal system**

Different cells in the tense/aspect paradigm call for different mutation grades of the verb root.

Partial Bedik tense/aspect paradigm for ‘to say (3rd sg. subj.)’:

<table>
<thead>
<tr>
<th></th>
<th>pres./factitive</th>
<th>past</th>
<th>future</th>
</tr>
</thead>
<tbody>
<tr>
<td>imperf.</td>
<td>ọ́-dē</td>
<td>ma-rē yé-kō</td>
<td>ọ́-dē-é</td>
</tr>
<tr>
<td>perf.</td>
<td>à-dē</td>
<td>à-dē-ɗ</td>
<td></td>
</tr>
<tr>
<td>habit.</td>
<td>mà-rē kò-rē</td>
<td>è-dē yé-d-kò</td>
<td>ma-rē èwō-dē</td>
</tr>
<tr>
<td>prog.</td>
<td>ọ̀rē láŋ ëwó</td>
<td>è-dē yé-kò</td>
<td></td>
</tr>
<tr>
<td>incho.</td>
<td>è-dē ëwó</td>
<td>kò-yé ma-rē</td>
<td></td>
</tr>
</tbody>
</table>
Initial lexical contrasts

In effect, these mutation systems greatly limit the possible lexical contrasts in root-initial position

Number of lexically-contrastive consonants in initial and non-initial position (for nouns/adjectives):

<table>
<thead>
<tr>
<th>Language</th>
<th>initial</th>
<th>non-initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Konyagi</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>Bedik</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>Basari</td>
<td>12</td>
<td>31</td>
</tr>
</tbody>
</table>
Initial prominence

Why are the Tenda facts interesting?

Because of the claim that stem-initial position is the best-suited for signaling lexical contrasts (Beckman 1998, Smith 2002, inter alia)

Within Africa, many languages have a higher number of contrastive consonant stem-initially than in other positions
  • Hyman (2003) for Basaa: 22 in C1 vs. 12 in C2

Beckman (1998: 120) furthermore predicts that “segments in the privileged [=initial] positions will exhibit resistance to the application of phonological processes”
History of Tenda mutation
Pre-Tenda consonant inventory

<table>
<thead>
<tr>
<th>Type</th>
<th>Consonants</th>
</tr>
</thead>
<tbody>
<tr>
<td>vl. stop</td>
<td>p, t, c, k</td>
</tr>
<tr>
<td>vl. cont.</td>
<td>f, ʃ, x</td>
</tr>
<tr>
<td>vd. stop</td>
<td>b, d, j, g</td>
</tr>
<tr>
<td>vd. cont.</td>
<td>w, r, y, ŋ</td>
</tr>
<tr>
<td>nasal</td>
<td>m, n, ñ, ŋ</td>
</tr>
<tr>
<td>implosive</td>
<td>ɓ, ɗ, ƴ</td>
</tr>
<tr>
<td>lateral</td>
<td>l</td>
</tr>
</tbody>
</table>
Sound changes into Proto-Tenda

Pre-Tenda consonants:

- p, f, t, c, j, k, x, b, w, d, r, j, y, g, ɣ, l, m, n, ñ, ɲ, ñ, ñ

Changes by environment into Proto-Tenda:

<table>
<thead>
<tr>
<th>Environment I</th>
<th>Environment II</th>
<th>Environment III</th>
</tr>
</thead>
<tbody>
<tr>
<td>f, r, j, x, w, r, y, y, l, w̃, l, ɣ, ɣ̃, ɓ, ɗ, ƴ</td>
<td>pp, tt, cc, kk, bb, dd, jj, gg, ll, mm, nn, ññ, ɳɲ, ɓɓ, ɗɗ, ƴƴ</td>
<td>mp, nt, nc, nk, mb, nd, nj, ng, (n)l, mm, nn, ññ, ɳɲ, mɓ, nd, ny</td>
</tr>
</tbody>
</table>

Environment III: In a cluster with nasal consonant in C1
Environment II: In a cluster with some other consonant in C1
Environment I: Not adjacent to another consonant

- The distinction between continuants and stops has been lost in all environments
- Initial mutation arises because different prefixes had different final consonants (or no consonant)
  - Compare the three noun class prefixes *a-*, *ɛd-* and *ɡɔŋ-
- Note that you can always unambiguously determine the full mutation series from a single member
Sound changes into Konyagi

Further sound changes took place in each language which led to the reshaping of the mutation system

Proto-Tenda:

I  f  r̥ ʃ  x  w  r  y  y  l  ŵ  l̲  y̲  ŭ̃  b̰  ḏ  ų̲
II pp tt cc kk bb dd jj gg ll mm nn ņ̪  ŋ̱  b̥  d̡  ų̳̲
III mp nt nc nk mb nd nj ng (n)l mm nn ņ̪  ņ̱  mb nd ny̲

Konyagi:

I  f  r  s  x  w  l  y  ŭ̲  l̲  ŭ̲  ŭ̲ ŵ  v  ry  y
II p t c k b d j g l m n ņ̪  ŋ̱  b̥  d̡  y̳̲
III p t c k mp nt nc nk l? m n ņ̪  ŋ̱ mb nd nj

After these changes, in some cases ambiguity exists if only one form of a given root is known
Verbal mutation in Konyagi

Example: \( \text{vàëñ} \sim \text{ɓàëñ} \sim \text{mbàëñ} \) ‘bury’

There are no verbs with these historically expected series:
  - \( l \sim l \sim l \)
  - \( y \sim j \sim nc \)

And almost none with:
  - \( w \sim b \sim mp \)
Verbal mutation in Konyagi

I  f  r  s  x  (w)  l  y  y/w  l  ŵ  l  ŭ  ŭ/w  b  ry  y
II p  t  c  k  (b)  d  j  g  l  m  n  ŋ  ɲ  ɓ  ɗ  ŋ'  y'
III p  t  c  k  (mp)  nt  nc  nk  l  m  n  ŋ  ɲ  mb  nd  nj

Because the grade I consonants of these series also appear in other series, they were reanalyzed as follows:

• y ~ j ~ nc → y ~ ŭ ~ nj or y ~ g ~ nk
• l ~ l ~ l → l ~ d ~ nt
• w ~ b ~ mp mostly reanalyzed as w ~ g ~ nk

Examples (given in grade II):

<table>
<thead>
<tr>
<th>Proto-Tenda</th>
<th>Konyagi</th>
<th>Bedik</th>
<th>Basari</th>
</tr>
</thead>
<tbody>
<tr>
<td>*jër</td>
<td>yël</td>
<td>jàrá</td>
<td>járà</td>
</tr>
<tr>
<td>*bër</td>
<td>gël</td>
<td>büér</td>
<td>bèr</td>
</tr>
</tbody>
</table>
Sound changes into Basari

Proto-Tenda:
I f ŋ j x w r y y l 净资产 y ɓ d ų
II pp tt cc kk bb dd jj gg ll mm nn ㄧ ㄧ ㄧ ㄧ bable dd ų ų
III mp nt nc nk mb nd nj ng (n)l mm nn ㄧ ㄧ ㄧ ㄧ mɓ nd ų ny ų

Basari:
I f s j x w r y y l 净资产 y ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ l ų
II p t c k b d j g l m n ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ ㄧ
III p t c ng mb nd nj ng l? m n ㄧ ㄧ ㄧ ㄧ m n ų

As in Konyagi, these sound changes create ambiguity across mutation series
Nominal mutation in Basari

Expected mutation series from regular sound change:

I  f  s  ŋ  x  w  r  y  y̯  l  ŵ  n  ŭ̯  ŭ̯  b̯  l  ſ̯  η
II  p  t  c  k  b  d  j  g  l  m  n  ŭ  ň  b  d  ſ  η
III  p  t  c  ng  mb  nd  nj  ng  l?  m  n  ň  ň  m  n  ň

Basari mutation series in nouns and adjectives:

I  f  s  ŋ  x  w  r  y  y  ŵ  l  ŭ  ŭ
II  p  t  c  k  b  d  j  g  ŭ  ň  ň  ň
III  p  t  c  ng  mb  nd  nj  ng  m  n  ň  ň

The 3 series arising from implosives (*ɓ, *ɗ, *ỹ) merge with the nasal series (*m, *n, *ñ)
  • Possible because implosives regularly become nasals in grade III (*mɓ > m)

Example: the Tenda root *ɓàkk ‘baobab’ (c.f. Sereer ɓaak, Ndut ɓaʔ)

Proto-Tenda  Class
*ɔ-ɓàkk  ɔ-I  ɔ-𝐰َا𝐤  ‘baobab fruits’ (expected ɔ-ɓَاkk)
*ɛ̲ɗ-ɓàkk  ɛ-II  ɛ-ɓَاkk  ‘baobab fruit’
*ɡaŋ-ɓàkk  a-III  a-
  ‘baobab tree’
Nominal mutation in Basari

Additionally, the *l ~ l ~ l series has merged with the l ~ d ~ n series
- Historically *l-, *n-, and *d- initial roots now all show an l ~ d ~ n alternation

<table>
<thead>
<tr>
<th>Proto-Tenda</th>
<th>Basari</th>
<th>c.f.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*làwó</td>
<td>ɛ-dâwór ‘invitation’</td>
<td>Ko. làwó</td>
</tr>
<tr>
<td>*nînnì</td>
<td>ɛ-dînì</td>
<td>Be. i-níní</td>
</tr>
<tr>
<td>*dɔkkónà</td>
<td>e-dɔkánà</td>
<td>Ko. i-dɔkwáɬ ‘kneel’</td>
</tr>
</tbody>
</table>

See also the regularized pattern in ‘lemon/orange/citron,’ a borrowing:

<table>
<thead>
<tr>
<th>class</th>
<th>Basari</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ɔ-I</td>
<td>o-lémúnà</td>
<td>‘oranges’</td>
</tr>
<tr>
<td>ɛ-II</td>
<td>e-děmúnà</td>
<td>‘orange’</td>
</tr>
<tr>
<td>α-III</td>
<td>α-némúnà</td>
<td>‘orange tree’</td>
</tr>
</tbody>
</table>
Analogical change

In both the Konyagi verbal system and Basari nominal system, mutation patterns were reanalyzed by analogical change.

In both of these cases, lexical contrasts were discarded in favor of a more uniform and predictable mutation system.

It would have been possible to preserve the lexical contrasts, and discard the mutation patterns, but this did not happen in any of these three languages.

<table>
<thead>
<tr>
<th>Earlier Basari</th>
<th>Hypothetical Basari</th>
<th>Real Basari</th>
</tr>
</thead>
<tbody>
<tr>
<td>*l ~ d ~ n</td>
<td>†d' ~ d' ~ d'</td>
<td>l ~ d' ~ n</td>
</tr>
<tr>
<td>*n ~ n ~ n</td>
<td>†n ~ n ~ n</td>
<td>l ~ d' ~ n</td>
</tr>
<tr>
<td>*l ~ l ~ l</td>
<td>†l ~ l ~ l</td>
<td>l ~ d' ~ n</td>
</tr>
</tbody>
</table>
Discussion

The current literature suggests that initial position is particularly well-suited for carrying the load of lexical contrasts

So why is initial mutation more typologically common?  
• Arises from prefixal/pre-stem material, but suffixes are more common typologically

Must be due to the privileged status of the stem-initial position—better at signaling contrasts

But these are not lexical contrasts, but grammatical  
• Even though this grammatical information is often redundant (also marked by segmental affixes)

The historical development of mutation in Tenda shows a willingness to sacrifice lexical contrasts in order to more consistently mark grammatical information
Conclusions

It is doubtless true that stem-initial position is best suited for exhibiting phonemic consonantal contrasts

- But this does not entail that these phonemic contrasts will be preferentially exploited for making lexical distinctions

When a language has the opportunity to exploit this position to signal grammatical information, it does so, to the detriment of lexical contrasts

The Tenda languages are the best example of this phenomenon, but the same could be said to some extent of any language with initial consonant mutation

Languages with initial consonant mutation suggest that the idea of initial prominence should be divorced from the concept of lexical contrastiveness

Instead, initial prominence simply privileges phonemic contrasts in initial position, and these contrasts may be used for either lexical or grammatical purposes
References


Thanks!