TONAL RECONSTRUCTION OF BENA–YUNGUR: DEPRESSOR CONSONANTS AND DIRECTIONALITY OF TONAL INTERACTIONS

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26 consonants: /b, p, d, t, tʃ, g, k, gb, kp, ?, ɓ, d, f, z, s, ʃ, h, m, n, ṃ, ŋ, l, ɻ, r, y, w/

- laryngeal settings: **voiced** vs. **voiceless** vs. (labial and coronal stops) **implosive**
- The difference in laryngeal settings is neutralized in coda stops, which normally lack audible release
- (N)C\(^{+\text{voice}}\) **clusters** in word-initial onsets: /(m)b, (n)d, (ŋ)g/
- Word-internal NC\(^{+\text{voice}}\) clusters tend to simplify to C\(^{+\text{voice}}\)
  
  \(bìndō \sim bìdō \text{ ‘granary’}, \ gòmbō \sim gòbō \text{ ‘vagina’}\)

- Word-final NC\(^{+\text{voice}}\) clusters (in construct forms) simplify to N
  
  \(bìndō > bìn \text{ ‘granary’}, \ gòm \sim gòm \text{ ‘vagina’}\)
6 vowel qualities: /i, e, a, ə, o, u/

- + length
- + nasalization
- **Tone system** (Idiatov & Van de Velde 2018)

  - TBU = \( \sigma \)

  - 3 tone levels: L M H

  - 1 TBU can be linked with all 6 logically possible combinations of 2 tones (HM, HL, LH, LM, MH and ML) and 1 combination of 3 tones (HLH)

  - no downstep

  - tones of all three levels can float, viz. \( H, M \) and \( L \).

  - two tone rules that apply to linked tones:
    - tone spread
    - tone absorption
**TONE SYSTEM: TONE SPREAD**

- **Tone spread**: Every tone can (and normally does) spread one position to the right across word boundaries, provided the tone occupying this position to the right is followed by a pause or by an identical tone.

(1) a. síbmá # bù: → síbmé bû: ‘ten herbalists’

   b. ṟmgbété # fētē → ṟmgbété fētē ‘two trees’

   c. dōtē # kūrūn → dōtē kùrūn ‘four bushes’

   d. bōltē # kūrūn → bōltē kūrūn ‘four pumpkins’
Moreover, a L does not spread onto a following M and a M does not spread onto a following L.

(2) dòbtà # fëtē → dòbtë fëtē, *dòbtë fëtē ‘two bushes’
(3) bàltā # bù: → bàltē bù:, *bàltē bù: ‘ten hills’

H spreads irrespective of the context on the right side of the tone that follows this H.
“can (and normally does) spread”: although extremely productive, tone spread remains optional and a tone may spread further than one position to the right.

(4) a. nű: # dàsè → nű: dàsè ‘the eye of a bean’
   b. nűː # dàsè → nűː dásè ‘the eye of a bean’
   c. nűː # dàsè → nűː dásè ‘the eye of a bean’
- **Tone absorption**: The final part of a complex tone is deleted if it is followed by an identical tone, e.g. HL#L → H#L.

  (5)  \[ \text{kálsâ} \ # \ \text{bòmbòm} \rightarrow \text{kálsó} \ \text{bòmbòm} \ ‘\text{fat monkeys (sp.)}’ \]

- Unlike tone spread, tone absorption also productively applies within words.

  (6)  \[ \text{tó:} \ # \ \text{gò:} \rightarrow \text{tó:} \ \text{gò:} \ ‘\text{take a chicken!}’ \]

  (7)  \[ \text{tó:} \ # \ \text{gò:sà} \rightarrow \text{tó:} \ \text{gò:sà} \rightarrow \text{tó:} \ \text{gó:sà} \ ‘\text{take chickens!}’ \]
TONE SYSTEM: FLOATING TONES

- tones of all three levels can float, viz. H, M and L.
- No sequences of floating tones exist: \( T_1 + T_2 > T_1 \)
- Floating tones are usually lexically specified, but may sometimes result from the application of tone rules
- They are found only in the lexical specifications of function morphemes (with one exception)

\( \ddot{e}n^H \) ‘with’, \( \ddot{a}^M \) ‘on, at’, \( \dot{a}y^L \) ‘3SG.AN.be’

\( \dot{a}tw\acute{a}n\ddot{\eta}(H) \) ‘grasshopper (sp)’
The rules governing the docking of floating tones are largely similar to the rules applied to linked tones:

- tone absorption (but $T_1^M/L > T_1$ and $T_1^L/M > T_1$)
- tone spread

All floating tones first try to dock to the right.

If they cannot dock to the right, floating $^H$ and $^M$ are deleted, while a floating $^L$ may also dock to the left if the preceding syllable is $^H$.

(8)  

a. áy $^L$ # bèm $\rightarrow$ áy bèm  ‘(s)he is large’
b. áy $^L$ # tʃɛbtnɛb $\rightarrow$ áy tʃɛbtnɛb  ‘(s)he is black’
c. áy $^L$ # ɓwáláŋ $\rightarrow$ áy ɓwàláŋ  ‘(s)he is tall’
d. áy $^L$ # lósá $\rightarrow$ ây lósá  ‘(S)he is like that’
Perseveratory (left-to-right) tone interaction

- Tone spread and tone absorption proceed only left-to-right
- Floating tones dock to the right, if they can
- As a result, tones tend to be realized one position to the right of their lexical attachment site

(9) ːnə̀ ːba ̂nə̀ ːbåːrā
| ːHbåːnê båːrā |
3SG.PFV scoop\PFV 1SG lie

‘He lied to me.’ (lit.: ‘He scooped me a lie’)
The number of H monosyllabic nouns and verbs more or less equals the sum of L and M words

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<thead>
<tr>
<th></th>
<th>Nouns</th>
<th>Verbs</th>
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<tbody>
<tr>
<td>H</td>
<td>25</td>
<td>25</td>
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<tr>
<td>M</td>
<td>10</td>
<td>15</td>
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<tr>
<td>L</td>
<td>15</td>
<td>12</td>
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</table>

L and M behave similarly in Bena-Yungur tonology
INTERNAL TONAL RECONSTRUCTION: [+VOICE]

- Stem-initial $C_{[+\text{voice}]} + L$ vs. $C_{[-\text{voice} / +\text{implosive}]} + H$ or $M$

- Exceptions are mostly clear recent borrowings and names for animals, which tend to have exceptional shapes

(10)  

\begin{align*}
\text{góndà} & \sim \text{gwándà} & \text{‘pawpaw’} \\
\text{gó:dê} & & \text{‘to thank’ (from Hausa gó:dê ‘to thank’)} \\
\text{kùltà} & & \text{‘lizard (sp.)’} \\
\text{pùkkō} & & \text{‘savannah monitor lizard’} \\
\text{kàdìn} & & \text{‘grasshopper (sp.)’} \\
\text{tèndò} & & \text{‘ant (sp.)’} \\
\text{tòrî} & & \text{‘gerbil’} \\
\text{tàbsā} & & \text{‘plant (sp.), } Senna \text{ obtusifolia’} \\
\text{pàv'àd} & & \text{‘(appear) suddenly’ (ideophone)} \\
\text{tàsàw} & & \text{‘measure, container used to measure things’} \\
\text{tàbā} & & \text{‘tobacco, cigarette’}
\end{align*}
Other phonemes and NC clusters \((m, n, r, l, f, h, mb, nd, ng, \eta mgb)\) largely pattern with \(C_{[-\text{voice} / +\text{implosive}]}\).

The voiceless fricative \(s\) shows no clear preference for a following tone.

This is due to a recent neutralization of the opposition between \(s\) and \(z\) in the Pra dialect of Bena-Yungur.
In the Guto dialect spoken to the south of Pra, all nouns with an initial \( z \) have a L tone and correspond to an initial \( s \) followed by a L tone in Pra.

(11) Guto         Pra
    zìːsà    sìːsà   ‘honey’
    zìyò    sìò    ‘bee’
    zàːŋgà    sàːŋgà   ‘tree (sp.)’
    zàː̀o    sàː̀ò   ‘snake’
    zàː    sàː   ‘gently’
    zàːrà    sàːrà   ‘pole’
    zèkà    sèkà   ‘make’
- **2 tone levels > 3 tone levels due to depressor consonants**

- Subsequent blurring of the straightforward relation between tones and consonants
  - the application of tone rules
  - devoicing of stem-initial voiced obstruents
  - erosion of segmental material
Due to the **perseveratory** nature of tone interaction (especially, tone spread), in **disyllabic words** the tone of the second syllable tends to be identical to that of the first.

\[
\begin{array}{llll}
\sigma_2 & H & HL & M & L \\
\sigma_1 & H & 43 & 4 & - & - \\
& M & - & - & 36 & - \\
& L & 1 & - & - & 75 \\
\end{array}
\]

Tone patterns of disyllabic verbs (imperative forms)
Due to the **perseveratory** nature tone interaction (especially, tone spread), in **disyllabic words** the tone of the second syllable tends to be identical to that of the first.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>HL</th>
<th>HM</th>
<th>M</th>
<th>ML</th>
<th>MH</th>
<th>L</th>
<th>LH</th>
<th>LM</th>
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<td>—</td>
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<td>—</td>
<td>4</td>
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<tr>
<td>M</td>
<td>9</td>
<td>5</td>
<td>1</td>
<td>121</td>
<td>1</td>
<td>3</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>L</td>
<td>17</td>
<td>7</td>
<td>5</td>
<td>62</td>
<td>1</td>
<td>—</td>
<td>112</td>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>HL</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>—</td>
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Tone patterns of disyllabic nouns
The **perseveratory** nature of tone interaction is likely to be an **innovation**, as suggested by:

- variability in the application and the domain of tone spread (see example 4)
- dialectal data

(12) Guto Pra
gìráŋgó gìràŋgó ‘crocodile’
RECONSTRUCTION: NC CLUSTERS

- **Word-initial** \( \text{NC}[^{+voice}] /_H \text{ or } M \rightarrow * \text{NC}[^{-voice} / +\text{implosive}] : \\
  - \text{mb} /_H \text{ or } M < *\text{mp} \text{ or } *\text{mb} /_*H \text{ or } *L \\
  - \text{nd} /_H \text{ or } M < *\text{nt} \text{ or } *\text{nd} /_*H \text{ or } *L \\
  - \eta g /_H \text{ or } M < *\eta k /_*H \text{ or } *L \\

- **Word-initial** \( \text{NC}[^{+voice}] /_L \rightarrow * \text{NC}[^{+voice}] : \\
  - \text{mb} /_L < *\text{mb} /_*H \text{ or } *L \\
  - \text{nd} /_L < *\text{nd} /_*H \text{ or } *L \\
  - \eta g /_L < *\eta g /_*H \text{ or } *L \\

- Less likely: *\text{mb}, *\text{nd} > \text{mb}, \text{nd} + L \text{ as a tone depressor}
Nouns have a higher number of tone schemes as dependents in genitive constructions (DTS = Dependent Tone Scheme) than in other contexts:

- **DTS A** = lexical tone is preserved

- **DTS B** = lexical tone changes: \( H \rightarrow M (\geq 1\sigma) \), \( L \rightarrow L.HL (\geq 2\sigma) \)

(13) a. témá 'sheep' (DTS\(_A\))
    b. dãːrə témá 'sheep skin'

(14) a. náː 'cow' (DTS\(_B\))
    b. bwàːrə nāː 'cow dung'

(15) a. dùŋgà 'iroko tree' (DTS\(_A\))
    b. lìŋgē dùŋgà 'the top of the iroko tree'

(16) a. dòbrà 'bush' (DTS\(_B\))
    b. tōːrō dòbrà 'the road of the bush'
- DTS of nouns is used with:
  - the dependents in the genitive construction
  - complements of nominalized verbs
  - complements of the prepositions $d\tilde{a}^H$ ‘in’ and $\tilde{a}^M$ ‘on, at’
The change $\text{DTS}_B \rightarrow \text{DTS}_A$ can be used as a derivational tool: a concrete space ($\text{DTS}_B$) $\rightarrow$ some abstract object associated with this space ($\text{DTS}_A$) (metonymical extension)

(17)  

<table>
<thead>
<tr>
<th></th>
<th>$\text{DTS}_B$</th>
<th>$\text{DTS}_A$</th>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>bütò ‘ground, soil’</td>
<td>‘land’</td>
</tr>
<tr>
<td>b</td>
<td>líwrá ‘sky, heaven’</td>
<td>‘God’</td>
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(18)  

<table>
<thead>
<tr>
<th></th>
<th>$\text{DTS}_B$</th>
<th>$\text{DTS}_A$</th>
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<tbody>
<tr>
<td></td>
<td>kántá ‘stones (sp); Kántá (the name of a village located in an area with many such stones)’</td>
<td>Kántá (a non-existent, but possible clan name)</td>
</tr>
</tbody>
</table>
For some nouns, both DTS may be acceptable

\[(19)\]  bìnò  ‘song; drumming’
  a.  dã bìnò  ‘in the song’ (DTS\(_A\))
  b.  dã bînô  ‘in the song’ (DTS\(_B\))

Lexicalized traces of DTS\(_B\), e.g. in compounds

\[(20)\]  núː  ‘eye’
  a.  dã núː  ‘in the eye’ (DTS\(_A\))
  b.  áw nêː  ‘eyeball’ (lit. ‘child of the eye’) (DTS\(_B\))

Tendency for regularization DTS\(_B\) → DTS\(_A\) (= analogical levelling)
  - DTS\(_A\) is much more frequent
  - DTS\(_A\) is identical to the lexical tone pattern
It is clear that $\text{DTS}_B$ reflects:

- **$\text{HL}$** of the respective **L stems** (with SI $\text{C}_{+[\text{voice}]}$)
- **$\text{LH}$** of the respective **H stems** (with SI $\text{C}_{-[\text{voice}]/+\text{implosive}}$)

This is also confirmed by **comparative evidence**:

- **BY** $\text{nám-ð} \text{ ‘meat’ (DTS}_{B-A})$ vs. Laala-Roba $\text{nàm-ð}$
- **BY** $\text{fétá(:)} \text{ ‘horn’ (DTS}_{B-A})$ vs. Laala-Roba $\text{fētā(:)}$
- **BY** $\text{bùt-ð} \text{ ‘ground’ (DTS}_B > bùt-ð ‘land’ (DTS}_A)$ vs. Laala-Roba $\text{pǔtū}$ ‘ground; land’
- **BY** $\text{bìn-ð} \text{ ‘song; singing; drumming’ (DTS}_{B-A})$ vs. Proto Bantu $\text{bǐn-à ‘song and dance’}$
- Full analogical levelling: **BY** $\text{tū: ‘rat’ (DTS}_A)$ vs. Laala-Roba $\text{tỳ: ‘rat’}$
That in head nouns \*LH > H after SI C\([-\text{voice} / +\text{implosive}]\) suggests that tone interaction used to be **anticipatory** (\(=\) right-to-left)

(recall that we’ve already seen other indications that the **perseveratory** nature of tone interaction is likely to be an **innovation**)

The Genitive construction can be reconstructed as:

\[
*[N_1 \ # \ H_1 \ # \ N_2 \ # \ H_2]
\]

Head GEN Dependent GEN

Something like a friend of John’s

- \(H_1\) is needed to account for the change \*LH > M after C\([-\text{voice} / +\text{implosive}]\) in \(N_2\)
- \(H_1\) is likely to be the source of the floating tones in the prepositions \(d\alpha^H \text{‘in’}\) and \(\text{‘on, at’}\)
- \(H_2\) is needed to account for the change \*HL > L.HL after C\([+\text{voice}]\) in \(N_2\)
Lexical tone patterns on verbs:

- 3 major tone patterns on verbs ≥ 1σ: H, M, L
- 2 marginal tone patterns on verbs = 2σ: L.H and H.HL
- L after $C_{[+\text{voice}]}$ and H and M after $C_{[-\text{voice} / + \text{implosive}]}$

Lexical tones stay put in all TAMP constructions with the exception of Positive Perfective:

- H → M
- M → H

(21) a. $nə^M # tómó = n$ → $nə \ tômôn$ ‘I did it.’
   b. $nə^M # kānā = n$ → $nə \ kānán$ ‘I entered.’
   c. $nə^M # bìn̂i = n$ → $nə \ bìn̂in$ ‘I sang.’
It is clear that the **PFV+ tone scheme** (with SI $C^{-\text{voice} / + \text{implosive}}$) reflects:

- *LH* of the respective **H stems**
- *HL* of the respective **M stems**

This is also confirmed by **comparative evidence**:

- **BY** tómó ‘do’ vs. Laala-Roba tòmō
- **BY** kāwā ‘break’ vs. Laala-Roba kāwâ

The **PFV+ verb form**: *[L-Verb]*
### Lexical tone patterns

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<th>Stage III</th>
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<td>*H</td>
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<td>*L</td>
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### PFV^+ tone scheme

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<td>*L-H</td>
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<td>*L-L</td>
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<td>*L-HL</td>
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### C[+voice]

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### C[-voice / + implosive]

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*L tone pattern must have been marginal in verbs and was regularized in PFV\(^+\) of verbs with after SI C\([-\text{voice} / +\text{implosive}]\) by analogy with *HL (modern M, PFV\(^+\): H)

The same tone change H→M and M→H is found in product NMLZ, typically with morphological class marker -ra/-ta

- káwá ‘make fall; wrestle, struggle’ vs. kāw-rā ‘wrestling’
- húrá ‘forget’ vs. hūrā:-tā ‘forgetfulness’
- kāŋgā ‘clear bush to make a farm’ vs. kāŋ-rá ‘clearing future farmland from trees’
- kāwā ‘ululate’ vs. káw-rá ‘ululation’ (DTS\(_{A-B}\))
In origin, PFV+ forms were NMLZ and L- prefix probably a class prefix.

Such product NMLZs can also help us to reconstruct tone patterns that cannot be reconstructed otherwise.

- **L** with $C_{[-\text{voice}]}$: kōɗō ‘coagulate’ vs. kwāɗmā ‘coagulated blood’ (i.e. NOT kwáɗmā)

- **HL** with $C_{[+\text{voice}]}$: bìnì ‘sing; play a drum’ vs. bìnò ‘song; drumming’ (DTS_{A~B})
Supplementary materials
GEN: $[N_1\#H_1\# N_2\#H_2]$ 

- **Stage I:**
  - 2 tone levels
  - no depressor consonants
  - tones normally stay put

- **Stage II:**
  - 2 tone levels
  - anticipatory tone interaction
  - depressor consonant effect triggers lowering $H > LH$ and inhibits anticipatory interaction $LH > H$ after stem-initial $C_{[+\text{voice}]}$
  - the anticipatory interaction $LH > H$ in $N_2$ is inhibited by the preceding $H_1$

- **Stage III:**
  - 3 tone levels as a result of the split of *L into M and L due to depressor consonants
  - loss of $H_1$
  - perseveratory tone interaction (rules of tone spread and tone absorption)
  - loss of $H_2$
### Stem-initial $C_{[+\text{voice}]}$

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</tr>
<tr>
<td>*HL</td>
<td>&gt; L</td>
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<tr>
<td></td>
<td>($\geq 2\sigma \rightarrow \text{DTS}_B: \text{L.HL}$)</td>
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<tr>
<td>*LH</td>
<td>&gt; L</td>
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### Stem-initial $C_{[-\text{voice} / +\text{implosive}]}$

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<td>&gt; H</td>
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<td>($\text{DTS}_B: \text{M}$)</td>
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