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, ʔ, ɓ, ɗ, f, z, s, ʃ, h, m, n, ɲ, ŋ, l, ⱱ, 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$_{[+voice]}$ **clusters** in word-initial onsets: /(m)b, (n)d, (ŋ)g/

  - Word-internal NC$_{[+voice]}$ clusters tend to simplify to C$_{[+voice]}$

    bìndō ~ bìdō 'granary', *gòmbō ~ gòbō* 'vagina'

  - Word-final NC$_{[+voice]}$ clusters (in construct forms) simplify to N

    bìndō > bìn 'granary', *gòm ~ gòm* 'vagina'

- 6 vowel qualities: /i, e, a, ə, o, u/

  - + length

  - + nasalization

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

  - TBU = σ

  - 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 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. síɓmá # bù: →   síɓmɔ́ bû: 'ten herbalists'

 b. ŋmgbété # fɔ̄tɔ̄   →   ŋmgbétɔ́ fɔ́tɔ̄ 'two trees'

 c. dòɓtà # kúrún   →   dòɓtɛ̀ kùrún 'four bushes'

 d. bōltā # kúrún   →   bōltɔ̄ kūrún 'four pumpkins'

- Moreover, a L does not spread onto a following M and a M does not spread onto a following L.

(2) dòɓtà # fə̄tə̄ → dòɓtə̀ fə̄tə̄, *dòɓtə̀ fə̀tə̄ 'two bushes'

(3) bàltā # bùː → bàltə̄ bùː, *bàltə̄ bùː '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.   nṹː # dàsè   →   nṹː dàsè   'the eye of a bean'

     b.   nṹː # dàsè   →   **nṹː dásè**   'the eye of a bean'

     c.   nṹː # dàsè   →   nṹː dásê   '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)   *kálsâ # bɜ̀mbɜ̀m → kálsɜ́ bɜ̀mbɜ̀m* 'fat monkeys (sp.)'

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

    (6)   tó: # gò: → tó: gô: 'take a chicken!'

    (7)   tó: # gò:sà → tó: gô:sà → tó: gó:sà 'take chickens!'

- tones of all three levels can float, viz. ^{H}, ^{M} and ^{L}.

- No sequences of floating tones exist: $^{T1} + {}^{T2} > {}^{T1}$

- 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)

  $\bar{\partial}n^H$ 'with', $\grave{a}^M$ 'on, at', $\acute{a}y^L$ '3SG.AN.be'

  $\grave{a}tw\acute{\hat{a}}\eta^{(H)}$ '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 # bə̀m   → áy bə̀m   '(s)he is large'

     b.   áy^L # tʃēɓtʃēɓ → áy tʃēɓtʃēɓ '(s)he is black'

     c.   áy^L # ɓwáláŋ   → áy ɓwàláŋ   '(s)he is tall'

     d.   áy^L # lósǎ   → ây lósǎ   '(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) ā   bá: nè   bâ:rā

    |ā^{H} bà: nɛ́   bà:rā|

    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

	Nouns	Verbs
H	25	25
M	10	15
L	15	12

- L and M behave similarly in Bena-Yungur tonology

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

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

  (10) góndà ~ gwándà   'pawpaw'
        gó:dê   'to thank' (from Hausa gó:dè 'to thank')
        kùltà   'lizard (sp.)'
        pùkkō   'savannah monitor lizard'
        kàdìn   'grasshopper (sp.)'
        tə̀ndò   'ant (sp.)'
        tòrî   'gerbil'
        tàɓsā   'plant (sp.), *Senna obtusifolia*'
        pàv̌àɗ   '(appear) suddenly' (ideophone)
        tàsàw   'measure, container used to measure things'
        tàbā   'tobacco, cigarette'

- Other phonemes and NC clusters (*m, n, r, l, f, h, mb, nd, ŋg, ŋmgb*) largely pattern with $C_{[-voice\ /\ +implosive]}$

- 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
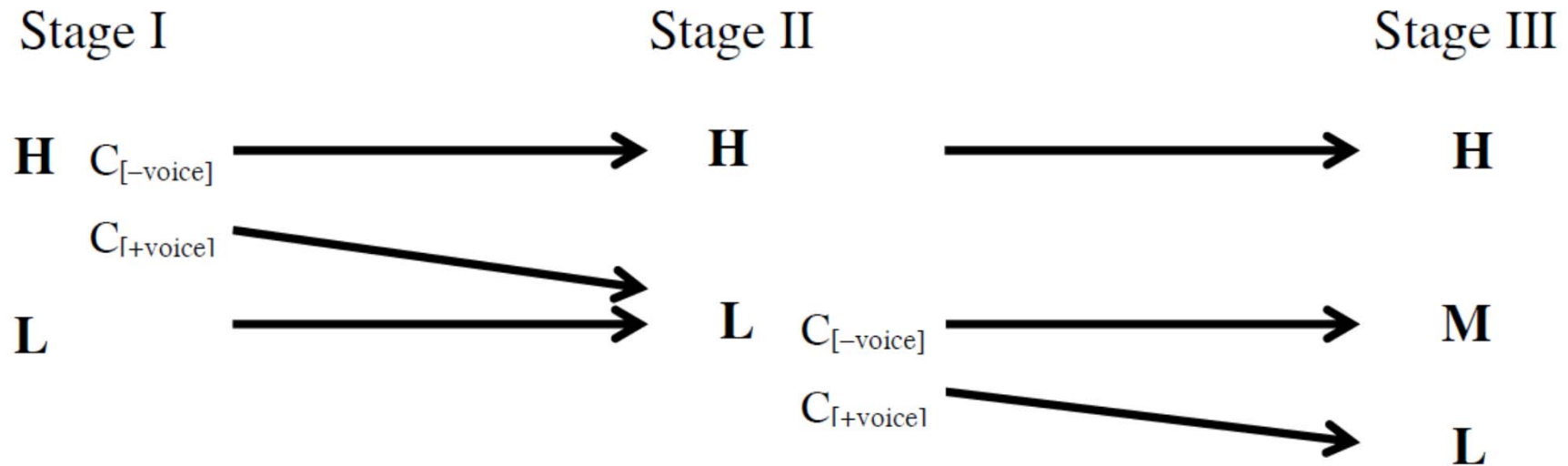
- In the Guto dialect spoken to the south of Pra, all nouns with an initial *z* have a L tone and correspond to an initial *s* followed by a L tone in Pra

(11) Guto   Pra

zǐːsà   sǐːsà   'honey'

zǐyǒ   sǐǒ   'bee'

zàːŋgà   sàːŋgà   'tree (sp.)'

zǎǒ   sǎǒ   'snake'

zǎ̀ː   sǎ̀ː   'gently'

zǎ̀ːrà   sǎ̀ːrà   'pole'

zə̀kə̀   sə̀kə̀   'make'

- *2 tone levels > 3 tone levels due to depressor consonants

Stage I	Stage II	Stage III

H $C_{[-voice]}$ → H → H

$C_{[+voice]}$ →

L → L $C_{[-voice]}$ → M

$C_{[+voice]}$ → L

- 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

$$\sigma_2$$

		H	HL	M	L
	H	43	4	—	—
σ_1	M	—	—	36	—
	L	1	—	—	75

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

σ_2

σ_1	H	HL	HM	M	ML	MH	L	LH	LM
H	145	20	—	—	—	—	4	—	—
M	9	5	1	121	1	3	—	—	—
L	17	7	5	62	1	—	112	4	—
HL	—	—	—	2	—	—	—	—	—

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'

- Word-initial $NC_{[+voice]}$ /_H or M → * $NC_{[-voice\ /\ +implosive]}$:

  - *mb* /_H or M < *mp* or *mɓ* /_*H or *L
  - *nd* /_H or M < *nt* or *nɗ* /_*H or *L
  - *ŋg* /_H or M < *ŋk* /_*H or *L

- Word-initial $NC_{[+voice]}$ /_L → * $NC_{[+voice]}$:

  - *mb* /_L < *mb* /_*H or *L
  - *nd* /_L < *nd* /_*H or *L
  - *ŋg* /_L < *ŋg* /_*H or *L

- Less likely: *mɓ, *nɗ > mb, nd* + L 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 → M ($\geq 1\sigma$), L → L.HL ($\geq 2\sigma$)

    (13) a.   tə́má   'sheep' (DTS_A)

            b.   dã̀ːrə̀ tə̀má   'sheep skin'

    (14) a.   náː   'cow' (DTS_B)

            b.   bwàːrə̀ nāː 'cow dung'

    (15) a.   dùŋgà   'iroko tree' (DTS_A)

            b.   līŋgē dùŋgà   'the top of the iroko tree'

    (16) a.   dòɓrà   'bush' (DTS_B)

            b.   tȭːrō̄ dòɓrâ   '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 $\grave{a}^M$ 'on, at'

- The change DTS$_B$ → DTS$_A$ can be used as a derivational tool: a concrete space (DTS$_B$) → some abstract object associated with this space (DTS$_A$) (metonymical extension)

(17)   DTS$_B$ DTS$_A$

    a.   bùtò   'ground, soil'   'land'

    b.   líwrá   'sky, heaven'   'God'

(18)   DTS$_B$ DTS$_A$

   káɲtá   'stones (sp); *Káɲtá* (the name of a village located in an area with many such stones)'   *Káɲtá* (a non-existent, but possible clan name)

- For some nouns, both DTS may be acceptable

  (19)   bìnò   'song; drumming'

        a.   ɗā bínò   'in the song' (DTS_A)

        b.   ɗā bînô   'in the song' (DTS_B)

- Lexicalized traces of DTS_B, e.g. in compounds

  (20)   nú: 'eye'

        a.   ɗā nú: 'in the eye' (DTS_A)

        b.   áw nē: 'eyeball' (lit. 'child of the eye') (DTS_B)

- Tendency for **regularization** $DTS_B \rightarrow DTS_A$ (= analogical levelling)

  - DTS_A is much more frequent

  - DTS_A is identical to the lexical tone pattern

- It is clear that DTS_B reflects:

  - *HL of the respective L stems (with SI $C_{[+voice]}$)

  - *LH of the respective H stems (with SI $C_{[-voice\ /\ +implosive]}$)

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

  - BY *nám-ó* 'meat' ($DTS_{B\sim A}$) vs. Laala-Roba *nàm-ō*

  - BY *fə̂tá(ː)* 'horn' ($DTS_{B\sim A}$) vs. Laala-Roba *fə̂tā(ː)*

  - BY *bùt-ò* 'ground' (DTS_B) > *bùt-ò* 'land' (DTS_A) vs. Laala-Roba *pûtū* 'ground; land'

  - BY *bìn-ò* 'song; singing; drumming' ($DTS_{B\sim A}$) vs. Proto Bantu *bín-à* 'song and dance'

  - Full analogical levelling: BY *tṹː* 'rat' (DTS_A) vs. Laala-Roba *tṳ̀ː* 'rat'

- That in head nouns $*LH > H$ after SI $C_{[-voice\ /\ +implosive]}$ 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:

$$*[N_1 \quad \# \ H_1 \quad \# \ N_2 \qquad \# \ H_2]$$
$$\text{Head} \quad \textbf{GEN} \quad \text{Dependent} \quad \textbf{GEN}$$

Something like *a friend **of** John's*

  - H_1 is needed to account for the change $*LH > M$ after $C_{[-voice\ /\ +implosive]}$ in N_2
  - H_1 is likely to be the source of the floating tones in the prepositions $d\tilde{a}^H$ 'in' and $\grave{a}^M$ 'on, at'
  - H_2 is needed to account for the change $*HL > L.HL$ after $C_{[+voice]}$ 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$_{[+voice]}$ and H and M after C$_{[-voice\ /\ +\ implosive]}$

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

  - H → M
  - M → H

    (21) a.   nə̀^{M} # tómó = n   →   nə̀ tōmōn   'I did it.'

          b.   nə̀^{M} # kānā = n   →   nə̀ kānán   'I entered.'

          c.   nə̀^{M} # bìnì = n   →   nə̀ bìnìn   'I sang.'

- It is clear that the **PFV⁺ tone scheme** (with SI $C_{[\text{-voice / + implosive}]}$) 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 *kāwà*

- The **PFV⁺ verb form**: *[L-Verb]

Lexical tone patterns

PFV+ tone scheme

$C_{[+voice]}$

Stage I		Stage III
*H	>	L
*L	>	L
*HL	>	L
*LH	>	L

Stage I		Stage III
*L-H	>	L
*L-L	>	L
*L-HL	>	L
*L-LH	>	L

$C_{[-voice \ / \ +implosive]}$

Stage I		Stage III
*H	>	H
*L	>	M
*HL	>	M
*LH	>	H

Stage I		Stage III
*L-H	>	M
*L-L	>	M → H
*L-HL	>	H
*L-LH	>	M

- ***L** tone pattern must have been **marginal** in verbs and **was regularized in PFV⁺** of verbs with after SI $C_{[-voice\,/\,+implosive]}$ 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. *hūrāː-tā* 'forgetfulness'
  - *kāŋgā* 'clear bush to make a farm' vs. *káŋ-rá* 'clearing future farmland from trees'
  - *kāwā* 'ululate' vs. *káw-rá* 'ululation' (DTS$_{A\sim B}$)

- In origin, **PFV$^+$** forms were **NMLZ** and **L- prefix** probably a **class prefix**

- Such **product NMLZ**s can also help us to reconstruct tone patterns that cannot be reconstructed otherwise

  - ***L with C$_{[-voice]}$**: *kōdɔ̃* 'coagulate' vs. *kwādɨ́mā* 'coagulated blood' (i.e. NOT *kwádɨ́mâ*)

  - ***HL with C$_{[+voice]}$**: *bìnǐ* 'sing; play a drum' vs. *bìnò* 'song; drumming' (DTS$_{A\sim B}$)

Supplementary materials

GEN: $[N_1 \# H_1 \# N_2 \# H_2]$

■ **Stage I:**

- 2 tone levels
- no depressor consonants
- tones normally stay put

	Stage I	Stage II	Stage III
H	$C_{[-voice]}$ →	H →	H
	$C_{[+voice]}$ →		
L	→	L $C_{[-voice]}$ →	M
		$C_{[+voice]}$ →	L

■ **Stage II:**

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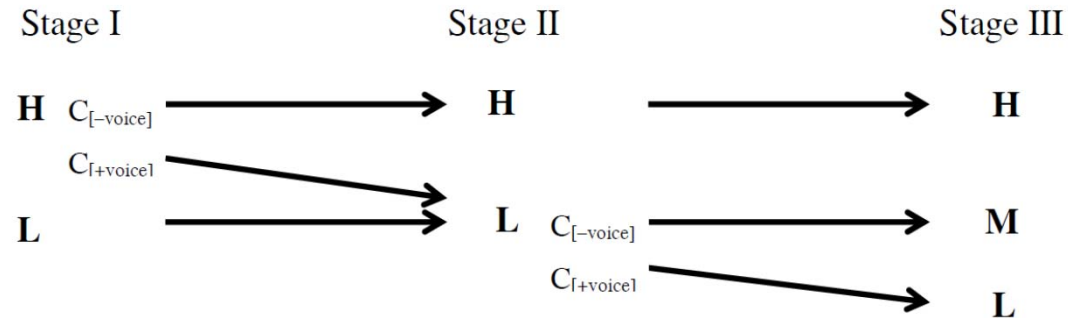
■ **Stage III:**

- 3 tone levels as a result of the split of *L into M and L due to depressor consonants
- loss of H1
- perseveratory tone interaction (rules of tone spread and tone absorption)
- loss of H2

- Stem-initial $C_{[+voice]}$

Stage I		Stage III
*H	>	L
*L	>	L
*HL	>	L
		$(\geq 2\sigma \rightarrow DTS_B: L.HL)$
*LH	>	L

- Stem-initial $C_{[-voice / +implosive]}$

Stage I		Stage III
*H	>	H
*L	>	M
*HL	>	M
*LH	>	H
		$(DTS_B: M)$