

Tone Polarity in Bangime Nouns¹

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1. Goals of the study

In Bangime, [bàngími], a (possible) language isolate spoken in Mali, tone polarity is exemplified in plural noun stems.

- What are the underlying tonal patterns on nouns roots?
- What is the underlying tone on the plural suffix?
- How can we use phonological theory to handle marked structures, with particular reference to tonal contour distribution?

2. Overview of Tone in Bangime

- Syllable is TBU
- Four-tone system: L–H–L̄H–Ø opposition
- Five tonal melodies /L, LH, L̄HL, H, HL/ underlyingly prelinked
- Floating tones exist on certain nouns
- Direction of association is R → L
- Nouns are separated into two tonal classes based on their surface variation with regards to tone polarity

3. Tone Class One: Polar

Tone polarity is exemplified in the plural forms of nouns, as is shown in (1). Note that the plural suffix –nde assumes the opposite tone of its respective root.

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(1) Tone Class One

Syllable Structure	Singular	Plural	Gloss
a) low tone on root ultimate mora ~ high tone on stem ultimate mora			
CV	kù	kù–ndé	egg
	ʒɔ̃ ⁿ	ʒɔ̃–ndé	rain/sky
mapped melody	L	L–H	
CVV	nàà	nàà–ndé	cow
	tèè	tèè–ndé	forge
mapped melody	LL	LL–H	
CVCV	dùwà	dùwà–ndé	tree
	bòrè	bòrè–ndé	Baobab tree
mapped melody	L–L	L–L–H	
CVCVCV	sòròyɔ̃	sòròyɔ̃–ndé	Bozo ethnicity
	pàyàrà	pàyàrà–ndé	container
mapped melody	L–L–L	L–L–L–H	
underlying melody	/L/	/L Ø / [H]	
CVCV	tótò	tótò–ndé	anvil
	L̄H–L	L̄H–L–H	
CVVCV	dòbè	dòbè–ndé	adze
mapped melody	L̄H–L	L̄H–L–H	
underlying melody	/L̄HL/	/L̄HL Ø / [H]	
b) high tone on root ultimate mora ~ low tone on stem ultimate mora			
CVV	kóó ⁿ	kóó–ndè	plank
	síí ⁿ	síí–ndè	mongoose
mapped melody	LH	LH–L	
CVCV	kùwó	kùwó–ndè	house
	L–H	L–H–L	
CVCVCV	bìròndó ⁿ	bìròndó–ndè	corn
mapped melody	L–L–H	L–L–H–L	
underlying melody	/LH/	/LH Ø / [L]	
CV	ké	ké–ndè	thing
	H	H–L	
CVV	tíí	tíí–ndè	older sibling
mapped melody	HH	HH–L	
underlying melody	/H/	/H Ø / [L]	

3.1. Analysis

The definition of tone polarity insists that the tone on the target syllable is underspecified. Hyman and Schuh (1974, p. 100) state, “Since it would be arbitrary to propose a specific underlying tone in the above cases, [referring to Margi] tonal polarity differs from tonal (or segmental) dissimilation, where one of two identical specified features dissimilates.”

3.1.1. Constraints

➤ Markedness Constraints

- a. POLAR: The last tone of a plural stem is opposite in value to the immediately preceding tone.² (Cahill, 2004)
- b. ALIGN (T, R, W, R): Align tones with the right edge of a word. (McCarthy & Prince, 1993, 1995)

➤ Wellformedness Constraints (based on Goldsmith (1976) and formalized in Pulleyblank (1997) and Yip (2002))

- c. SPECIFY T: A TBU may be associated with at least one tone.
- d. *ASSOCIATE: Do not insert new association lines.
- e. *FLOAT: A tone must be associated with a TBU.

➤ Faithfulness Constraints (McCarthy & Prince, 1995)

- f. IDENT-IO(Tone): if α is a TBU in the input and β is a correspondent of α in the output, then the tonal specification of α must be identical to the tonal specification of β .
- g. DEP-IO(Tone): Output tones must have input correspondences.
- h. *SPREAD: For all T, there is at most one TBU. (Antilla, 1996)

3.1.2. Ranking

POLAR, SPECIFY T >> *SPREAD >> DEP(T), ID(T), *ASSOCIATE, ALIGN R

² Though Cahill’s constraint specifically refers to a noun class suffix found in Kɔnni, the same constraint can be used here.

3.1.3. Tableaux

(2) b̀̀r̀̀e ~ b̀̀r̀̀e-ndé ‘baobab’

	/b̀̀r̀̀e + nde/	POLAR	SPECIFY T	DEP(T)	ID(T)	*ASSOCIATE
	 L ̸					
a.	L b̄ re nde L		*!*			
b.	L b̄ re nde L	*!	*			*
c.	LH b̄ re nde L H			*		**
d.	HL b̄ re nde H L			*	*!	**

(3) k̀̀ẁ̀ó ~ k̀̀ẁ̀ó-ndè ‘house’

	/kuwo + nde/	POLAR	SPECIFY T	*SPREAD	DEP (T)	ALIGN R	ID (T)	*ASSOCIATE
	 L H ̸							
a.	LH ku wo nde L H		*!			**		*
b.	LH ku wo nde L H			*!		*		*
c.	LHL ku wo nde L H L				*	**		*
d.	LHH ku wo nde L H H	*!			*	**		*

3.2 Summary of Tonal Class One

- All tones are prelinked underlyingly on singular forms
- Fits even the most current definitions of tone polarity (Hyman, 2007, p. 502; Yip, 2002, p. 159)
- Tone of plural marker is underspecified until it is suffixed onto the root at which time it assumes the opposite tone of the root

4. Tone Class Two: Floating Tones

The examples in (4) are posited to have an additional underlying tone which is not prelinked. Note that these forms differ from those in Tone Class One in (1) above in that the tone of root-final mora shifts to the opposite tone of the suffix.

(4)	Syllable Structure	Singular	Plural	Gloss
	CV	kũ ⁿ	kũ-ndé	waist
	mapped melody	ḲḲ	L-H	
	CVV	bi ⁿ	bi-ndé	year
	mapped melody	ḡi	ḡi-ndé	mouse
	CVCV	bùwó	bùwò-ndé	field
	mapped melody	dámá	dámà-ndé	hoe
	underlying melody	/LH(H)/	/LH(H)/	
	eye	síbè	síbé-ndè	eye
	mapped melody	ḲḲ-L	ḲḲ-H-L	
	CVVCV	pùúpà	pùúpá-ndè	bellows
	mapped melody	ḲḲ-L	ḲḲ-H-L	
	underlying melody	/ḲḲ L(L)/	/ḲḲ L(L)/	
	CVCVCV	kóróṅò	kóróṅó-ndè	donkey
	mapped melody	jírífbè	jírífbé-ndè	animal
	underlying melody	/H L(L)/	/H L(L)/	

4.1 Analysis

The nouns in tonal class two are also prelinked but there is also an additional floating tone which is posited to exist in the lexical noun form but is only allowed to link to an underlyingly toneless syllable.

4.1.1 Constraints

The POLAR constraint above must now be modified slightly as in h.

- h. POLAR: A toneless mora receives the opposite tone of an adjacent tone at a morpheme boundary.

In addition to the above outlined constraints, additional faithfulness constraints are listed in i., with the addition a positional faithfulness constraint (Beckman, 1999), listed in j. below.

- i. MAX-IO(Tone): Input tones must have output correspondences. (Yip, 2002)
- j. IDENT-IO(Tone, Float): An output floating tone has the same tone as its input correspondent.

4.1.2 Ranking

POLAR, ID(T, F), MAX(T), SPECIFY T >> *SPREAD, *FLOAT >> DEP(T), ID(T), *ASSOCIATE, ALIGN R

4.1.3 Tableaux

(5) bùwó ~ bùwò-ndé 'field'

	/buwo-nde/	POLAR	ID (T, F)	MAX (T)	SPECIFY T	*FLOAT	ID (T)	ALIGN R
	 L H H							
a.	L H(H) bu wo nde L H H	*!			*	*		**
b.	LH bu wo nde L H			*!				*
c.	LLH bu wo nde L L H						*	**
d.	LHL bu wo nde L H L		*!				*	**

5. Tonal Contours

➤ Unlike most African languages (Odden, 1995), contour tones are analyzed as units as in Asian languages (Bao, 1999; Chan, 1991; Yip, 1989; Zhang, 2002a), it is common for African languages to represent contour tones as a series of level tones.³ The examples /tɔ̀tɔ̀/ ‘anvil’, from Tone Class One, and /ʒèèbè/ ‘ax’, from Tone Class Two, are shown in tableaux in (6) and (7) below, respectively.

➤ Even though Hyman (2007, p. 14) states that it is almost unheard of in West-African languages, the series of like-level tones at the left edge of the word as in examples such as /bìròndɔ̀/ ‘corn’ from Tone Class One and /kóròŋò/ ‘donkey’ from Tone Class Two provide evidence that linking and spreading must take place from right to left.⁴

5.1. Additional Constraints

Because of the unusual behavior of the tonal contours in Bangime, Zhang’s (2002b) C_{CONTOUR} constraints which militate against non-typologically based distribution of tonal contours, would be necessarily low-ranked as would Yip’s (2002) and Akinlabi’s (1996) constraints listed in below k. – m.

- k. NOCONTOUR: A TBU may be associated with at most one tone.
- l. NON-FINALITY: Do not align tones with the right edge of the prosodic word.
- m. *FALL: Falling contour tones are banned.

³ For other examples of African languages in which contour tones are analyzed as units, see Wobé, (Beath & Link, 1980) Grebo, (Newman, 1986) and !Xóó (Traill, 1985).

⁴ Note that Newman (1974) evaluated Kanakuru as being right to left association despite Goldsmith’s (1976) Wellformedness Convention that languages spread tones to empty TBU’s left to right.

5.2. Tableaux

(6) tɔ̀tɔ̀ ~ tɔ̀tɔ̀.ndé ‘anvil’

	/tɔ̀ tɔ̀-nde/ L̄H L 0	POLAR	SPECIFY T	DEP (T)	ALIGN R	ID (T)	*ASSOCIATE
a.	L̄HL tɔ̀ tɔ̀ ndé L̄H L		*!		*		
b.	L̄HL tɔ̀ tɔ̀ ndé L̄H L	*!	*		*		
c.	L̄HLH tɔ̀ tɔ̀ ndé L̄H L H			*	**		*
d.	L̄HHL tɔ̀ tɔ̀ ndé L̄H H L			*	**	*!	*

(7) ʒèèbè ~ ʒèèbè-ndé ‘ax’

	/ʒèèbè-nde/ L̄H L L	POLAR	ID (T, F)	MAX (T)	SPECIFY T	*FLOAT	ID (T)	*ASSOCIATE
a.	L̄H L⓪ ʒèè be ndé L̄H L L	*!			*	*		
b.	L̄H L ʒèè be ndé L̄H L	*!		*	*			
c.	L̄HHL ʒèè be ndé L̄H H L						*	*
d.	L̄HLH ʒèè be ndé L̄H L H		*!				*	*

6. Summary

- Bangime has (at least) two tonal classes among nouns.
- In the first tonal class, all tones are underlyingly linked to their respective TBU's.
- In the second tonal class, in addition to underlyingly linked tones, there is a floating tone which only attaches to an underlyingly toneless TBU.
- The plural suffix is underlyingly toneless.
- The number of marked processes which occur in the language is high, therefore, certain markedness constraints pertaining to contour tones in particular, are ranked low in the language.

References

- Akinlabi, A. (1996). Featural Affixation. *Journal of Linguistics*, 32(2), 239-289.
- Antilla, A. a. B., Adams (1996). Stress and Tone in Dagaare. *ROA-169-1296*.
- Bao, Z. M. (1999). *The Structure of Tone*. Oxford: Oxford University Press.
- Bearth, T., & Link, C. (1980). The tone puzzle of Wobé. *Studies in African Linguistics*, 11, 147-207.
- Beckman, J. (1999). *Positional faithfulness : an optionality theoretic treatment of phonological asymmetries*. New York: Garland.
- Cahill, M. (2004). Tone polarity in Konni nouns. *Studies in African Linguistics*, 33(1), 1-33.
- Chan, M. (1991). Contour-tone spreading and tone sandhi in Danyang Chinese. *Phonology*, 8, 237-259.
- Goldsmith, J. Autosegmental Phonology (1976) Bloomington, IN: Indiana University Linguistics Club.
- Hyman, L. (2007). Universals of Tone Rules: 30 Years Later. In C. Gussenhoven & T. Riad (Eds.), *Tones and Tunes: Studies in Word and Sentence Prosody* (pp. 1- 34). Berlin: Mouton de Gruyter.
- Hyman, L., & Schuh, R. (1974). Universals of tone rules: Evidence from West Africa. *Linguistic Inquiry*, 5, 81-115.
- McCarthy, J., & Prince, A. (1993). Generalized Alignment. University of Massachusetts, Amherst and Rutgers University, New Brunswick, N.J.
- McCarthy, J., & Prince, A. (1995). Faithfulness and reduplicative identity. In J. Beckman, L. W. Dickey & S. Urbanczyk (Eds.), *Papers in Optimality Theory* (pp. 249-384). Amherst: University of Massachusetts: University of Massachusetts Occasional Papers in Linguistics.
- Newman, P. (1974). *The Kanakuru Language*. Cambridge: Cambridge University Press.
- Newman, P. (1986). Contour tones as phonemic primes in Grebo. In K. Bogers, H. v. d. Hulst & M. Mous (Eds.), *The phonological representation of suprasegmentals* (pp. 175-193). Dordrecht: Foris.
- Odden, D. (1995). Tone: African Languages. In J. Goldsmith (Ed.), *The Handbook of Phonological Theory* (pp. 441-475). Cambridge: Blackwell.
- Pulleyblank, D. (1997). Optimality Theory and features. In D. Archangeli & D. T. Langendoen (Eds.), *Optimality Theory: An overview* (pp. 59-101). Oxford: Blackwell.
- Traill, A. (1985). *phonetic and phonological studies of !Xóõ bushman*. Hamburg: Helmut Buske Verlag.
- Yip, M. (1989). Contour tones. *Phonology*, 6, 149-174.
- Yip, M. (2002). *Tone*. Cambridge: Cambridge University Press.
- Zhang, J. (2002a). Contour Tone Licensing and Moraicity. *Proceedings of the West Coast Conference on Formal Linguistics*, 21, 471-484.
- Zhang, J. (2002b). *The effects of duration and sonority on contour tone distribution : a typological survey and formal analysis*. New York: Routledge.