The +/–ATR Harmonic Domain in two Dialects of Yorùbá

Jeremy Perkins
Rutgers University
jerperk@eden.rutgers.edu

1 Outline

- Basic pattern of tongue-root harmony presented in mid vowels.
  - All mid vowels share the same values in a word for [+/–ATR], henceforth +/– A.
  - Harmonic behaviour of clitics differs in Mọba (IPA: mãba) (henceforth MB) and Standard Yorùbá (henceforth SY).
- The harmonic domain in MB includes proclitics in leftward spreading of –A.
  - Underlyingly –A clitics do not harmonize.
  - SY has a harmonic domain that does not include the clitics (Prosodic Word).
- An OT analysis will be presented utilizing markedness constraints banning sequences of adjacent –A and +A vowels.
- Highlights of the Account:
  - The clitic data will force a domain split for some constraints that must apply preferably in the Prosodic Word.
  - High vowels are always +A & block harmony – markedness constraints.
  - Low vowels are always –A & trigger harmony leftward only – split AGREE into two constraints banning + – sequences and – + sequences.
  - –A is preferentially right-aligned – positional faithfulness: MAX A in the prosodic head (word-final vowels).

2 Original data elicited from Oladiipo Ajiboye who is a native speaker of Mọba Yorùbá. All Standard Yorùbá forms were taken from Archangeli & Pulleyblank (1989), checked with consultant (who is fluent in SY) and Mọba correlates were elicited.

3 Root-Level –ATR Harmony with Mid Vowels

3.1 Introduction

- The pattern of –A harmony (Archangeli & Pulleyblank, 1989) is identical in MB & SY.
- Only mid vowels show the distinction between +/– A.

(1) Yorùbá Vowel Inventory

	[–BACK]	[+BACK]	
+A	i	u	[+HI]
	e	o	[–HI,-LO]
–A	ɛ	ɔ	[–HI,-LO]
	a		[+LO]

3.2 Harmony in the Word – MB & SY Same

(2) Mid Vowels: +/–A harmonic triggers

	Both Dialects	Gloss	Pattern
a.	ewé	'leaf'	+ +
	* ɛwé		*– +
	* ewɛ́		*+ –
b.	èkɔ	'pap'	– –
	* èkɔ		*+ –
	* èko		*– +

Mid-Vowel Prefixes Harmonize

	MB	SY	Gloss	Pattern
c.	dɛ	dɛ	'to hunt'	–
	ɔdɛ	ɔdɛ	'hunter'	– –
	*odɛ	*odɛ		*+ –
d.	ʤoú	ʤowú	'to be jealous'	+ +
	oʤòú	òʤòwú	'a jealous person'	+ + +
	*ɔ̀ʤòú	*ɔ̀ʤòwú		*– + +

- Prefixes are included in the Prosodic Word domain, which is the domain for harmony (in SY) (Archangeli & Pulleyblank, 1989; Pulleyblank, 1996).

3.3 –ATR Harmony in the Clitic Domain – MB & SY Different

- MB clitics harmonize sometimes (3c, d); SY clitics never harmonize.
- 3.SG clitic in MB is underlyingly +A (3c, d).
- 2.SG clitic in MB is underlyingly –A (3a, b).
- In the Clitic Domain, +A vowels are targeted, but not –A vowels.

(3) Proclitics – Differences in Domain-Size in Mọba & Standard Yorùbá

	MB	SY	Gloss	Meaning
a.	ǒ se	o ʃe	2.SG = 'do'	'you(sg.) do/did'
	– +	+ +		
b.	ǒ ʤɛ	o ʤɛ	2.SG = 'eat'	'you(sg.) eat/ate'
	– –	+ –		

c.	**é se**	**ó ʃe**	3.SG = 'do'	's/he does/did'
	+ +	+ +		
d.	**é ʤɛ**	**ó ʤɛ**	3.SG = 'eat'	's/he eat/ate'
	– –	+ –		
e.	ĩ se	ɛ ʃe	2.PL = 'do'	'you(pl.) do/did'
	+ +	– +		
f.	ĩ ʤɛ	ɛ ʤɛ	2.PL = 'eat'	'you(pl.) eat/ate'
	+ –	– –		

(4) Summary: Harmonic Behaviour of Vowels in Different Domains

Clitic Underlying Rep	MB	SY
+A	**Harmony**	No Harmony
–A	**No Harmony**	No Harmony
Prefix & Root Underlying Rep		
+A	Harmony	Harmony
–A	Harmony	Harmony

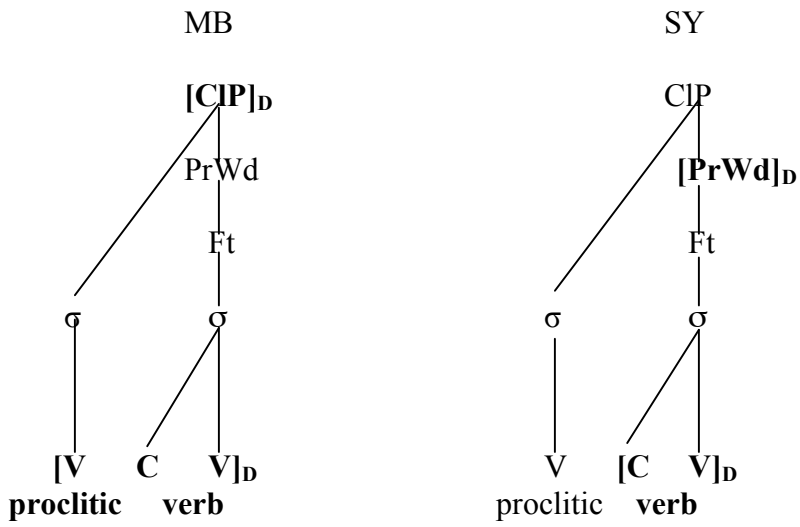
Note: Positional Faithfulness allows contrast in tighter domains. We have a contrast here (in the 2.SG clitic) in a wider domain that is not seen in the tighter (word) domain. This effect can be captured via high-ranked positional markedness constraints.

4 Analysis of Domain Size

- Prosodic constituents present: syllables, feet, and prosodic word (Ọla, 1995).
- Root-final syllable is the prosodic head syllable (PrHd) (Ọla, 1995).
- Prosodic word (PrWd) is the domain for leftward –A harmony (Pulleyblank, 1996).
- Proclitics not in harmonic domain in SY.
- Proclitics parsed in a prosodic category dominating the PrWd: the clitic phrase (ClP) (Nespor & Vogel, 1986).

- In MB, Clitics are outside the domain of harmony, therefore the ClP is the harmonic domain.

(5) Harmonic Domains in MB & SY:



5 An OT Account for –ATR Harmony in Mọba Yorùbá

5.1 Outline of the Account

- Constraints can be relativized to phonological domains, such as ClP, PrWd, PrHd.
- Harmony in domain A: $[\text{Markedness}]_A$ >> Faithfulness
- No Harmony in domain B: Faithfulness >> $[\text{Markedness}]_B$
- Stringency relation: If domain A is subordinate to domain B, then all violations of constraint [C]-A in domain A also necessarily imply violations of constraint [C]-B in domain B.
    - I.e: violations of [C] PrWd imply violations of [C] ClP.

5.2 Constraints Used

1. Markedness constraints (both undominated):
    a. *[+HI, –A] militates against high vowels that are –A.
    b. *[+LO, +A] militates against low vowels that are +A.
2. Feature-sequence prohibition constraints, *F G.
    a. Disharmonic sequences are prohibited: *+A –A and *–A +A.
        i. Note: Two ways to satisfy *+A –A: leftward –A harmony or rightward +A harmony.
3. Faithfulness constraints ensure underlying feature values are preserved.
    a. ID F: 1 violation incurred for every segment that is specified underlyingly as αF, but that does not surface as αF.
    b. ID +A, ID –A, ID HI, ID LO used.
4. Domain-specific constraints can be defined: ClP, PrWd, PrHd:
    a. *–A +A ClP militates against –A +A sequences anywhere in the clitic phrase.

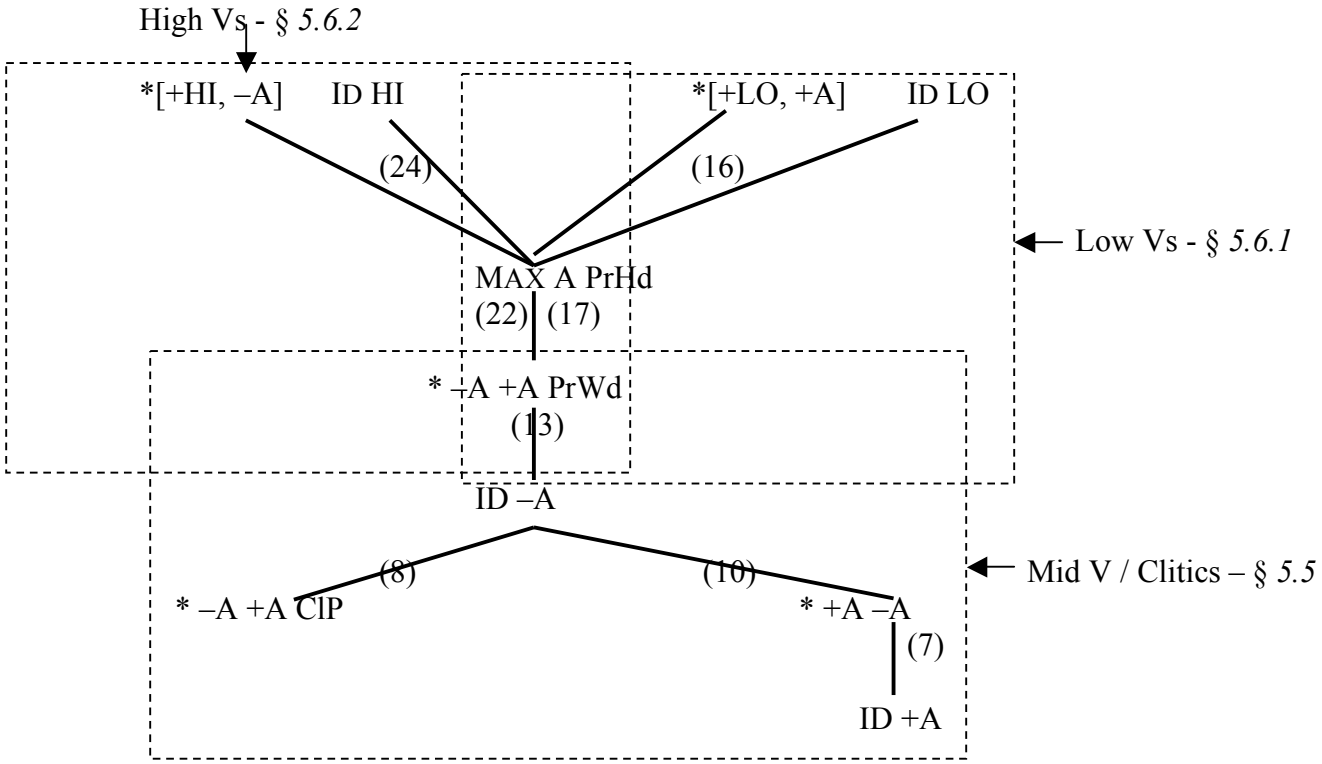
5. Positional Faithfulness: MAX A PrHd
    a. Positional faithfulness (the prosodic head is a privileged position where the final syllable is the prosodic head in Yorùbá (Ọla 1995)).
    b. MAX A allows re-association of –A as a solution to avoid violations.
        i. ID –A incurs violations for re-association of –A specifications.

5.3 How To Get Harmony?

a. If ID +A, ID –A >> *–A +A
   then no harmony.
b. If ID +A, *–A +A >> ID –A
   then leftward +A harmony
c. If ID –A, *–A +A >> ID +A
   then rightward –A harmony

5.4 OT Constraint Ranking for Mọba Yorùbá

(6) Final Constraint Ranking for Mọba Yorùbá –A Harmony
(Numbered Rankings refer to tableaux below)



5.5 Harmony in Clitics & Mid Vowels

(7) Leftward –A Harmony in the ClP (and PrWd):

ID –A, * +A –A >> ID +A

/é d͡ʒɛ/	ID –A	* +A –A	ID +A
a. é d͡ʒɛ		*!	
☞ b. ɛ́ d͡ʒɛ			*
c. é d͡ʒe	*!		

(8) No Leftward +A Harmony in the ClP:

MAX A PrHd, ID –A >> *–A +A ClP

/ɔ̌ de/	MAX A PrHd	ID –A	* –A +A ClP	ID +A
☞ a. ɔ̌ de			*	
b. ɔ̌ dɛ	*!			*
c. ǒ de		*!		

(9) 2.SG object enclitic surfaces –A even with preceding +A verb

MB	SY	Gloss	Meaning
adé lé ɔ	adé lé ɛ	‘Ade’ ‘pursue’ = 2.SG	‘A. pursue(s/d) you’
adé kɔ́ ɔ	adé kɔ́ ɛ	‘Ade’ ‘teach’ = 2.SG	‘A. teaches/taught you’

(10) No Harmony with –A Enclitics:

MAX A PrHd, ID –A >> *+A –A

/lé ɔ/	MAX A PrHd	ID –A	* +A –A
☞ a. lé ɔ			*
b. lɛ́ ɔ	*!		
c. lé o		*!	

- There are no +A mid-vowel enclitics – cannot rank * –A +A ClP & ID +A.
  - Rightward –A harmony in clitics?

(11) Multiple Proclitics in MB harmonize

	MB	Gloss	Meaning
a.	ĩ kè è dé	2.PL = NEG = FUT = 'arrive'	'you will not arrive'
b.	ĩ kè è sɛ́	2.PL = NEG = FUT = 'change money'	'you will not change money'
c.	ɔ kè í sɛ́	2.SG = NEG = PROG = 'change money'	'you are not changing money'

- This data still isn't decisive in ranking * –A +A ClP & ID +A:
  - A violation of *–A +A is unavoidable.
  - This is an environment where we expect a clitic to show its underlying value. In this case, we are led to believe that the negative marker is +ATR underlyingly.
- (11b) presents a problem for the account:

(12) Harmony Blocked by Leftmost High V's

/ĩ kè è sɛ́/	MAX A PrHd	ID –A	*+A –A	ID +A
💣 a. ĩ kè è sɛ́			*	*!*
☞ b. ĩ kè è sɛ́			*	
c. ĩ kè è sé	*!	*		

- This problem can be solved if we replace *+A –A with *[+A,-HI] –A.
  - The non-high condition would motivate harmony up until the first high vowel is reached.

(13) Leftward +A Harmony Enforced in the PrWd

* –A +A PrWd >> ID –A

/ɛ̀ʤe/	* –A +A PrWd	ID –A
a. ɛ̀ʤe	*!	
☞ b. èʤe		*

- Note: This predicts that we should never get –A vowels preceding high vowels, but these sequences do exist.
- Positional Markedness enforces harmony in the Prosodic Word (* –A +A PrWd).

5.6 Loose Ends

- In dysyllables, high vowels, mid vowels & low vowels pattern differently:

(14) *Surface* Harmonic Triggers & Participants

	Undergo Harmony?	**Trigger Harmony?**
Mid Vowels	✓	✓
Low Vowels		✓
High Vowels		

- Trisyllable words with medial high vowels flanked by mid vowels always right-align –A if present: Positional Faithfulness (MAX A PrHd).

5.6.1 Low Vowels

(15) Low Vowels: Always –A, triggers of **leftward** –A harmony

	MB	SY	Gloss	Pattern
a.	ate	ate	'hat'	– +
b.	àʤɛ̀	àʤɛ̀	'paddle'	– –
c.	ɛ̀k͡pà	ɛ̀k͡pà	'groundnut'	– –
d.	* ɛ̀k͡pà	* ɛ̀k͡pà		*+ –

(16) Low Vowels are Always –A:

*[+LO, +A], ID LO >> *–A +A PrWd, ID +A

/ædé/	*[+LO, +A]	ID LO	*–A +A PrWd	ID +A
a. ædé	*!			
☞ b. adé			*	*
c. edé		*!		

(17) Low V's Don't Trigger Rightward –A Harmony:

MAX A PrHd >> * –A +A PrWd

/ate/	MAX A PrHd	* –A +A PrWd
☞ a. ate		*
b. atɛ	*!	

(18) Low V's Trigger Leftward –A Harmony:

* +A –A >> ID +A (Same ranking as (7))

/èk͡pà/	*+A –A	ID +A PrWd
a. èk͡pà	*!	
☞ b. ɛ̀k͡pà		*

5.6.2 High Vowels

(19) High V's: Always +A, not harmonic triggers

	MB	SY	Gloss	Pattern
a.	ulé	ilé	'house'	+ +
b.	ilɛ̀	ilɛ̀	'ground'	+ –
c.	etí	etí	'ear'	+ +
d.	èbi	èbi	'guilt'	– +

(20) High V's are Always +A:

*[+HI, –A], ID HI >> ID –A

/àtɪ/	*[+HI, –A]	ID HI	ID –A
a. àtɪ	*!		
☞ b. àti			*
c. àtɛ		*!	

(21) Surface Contrast in Prefix – Underlying Contrast in Roots

- High vowel roots that are underlyingly –A can't surface but prefixes can preserve the contrast:

	Underlying Form	MB	SY	Gloss
a.	/kú/	kú	kú	'to die'
	/o+kú/	òkú	òkú	'corpse of a person'
b.	/mʊ/	mu	mu	'to drink'
	/o+mʊ/	ɔ̀mu	ɔ̀mu	'drinker'

- Positional Faithfulness preserves –A in the final vowel, which is the prosodic head
  - MAX A PrHd allows reassocation of the underlying –A.
  - ID –A would not allow reassociation of the underlying –A.

(22) High V's Don't Trigger Leftward –A Harmony:

MAX A PrHd >> * –A +A PrWd

/ɛ̀$_i$bɪ$_j$/	*[+HI, –A]	ID HI	MAX A PrHd	* –A +A PrWd	ID –A
a. ɛ̀$_i$bɪ$_j$	*!				
☞ b. ɛ̀$_j$bi				*	*
c. èbi			*!		**
d. ɛ̀$_i$bɛ$_j$		*!			

(23) High Vowels do not Trigger Rightward +A Harmony:

MAX A PrHd >> *+A –A

/ilɛ̀/	*[+HI, –A]	MAX A PrHd	*+A –A
☞ a. ilɛ̀			*
b. ilè		*!	
c. ɪlɛ̀	*!		

(24) Markedness Overrules Faithfulness in High-V-Only Words:

*[+HI, –A], ID HI >> MAX A PrHd

/ɪgɪ/	*[+HI, –A]	ID HI	MAX A PrHd	ID –A
☞ a. igi			*	**
b. ɪgɪ	*!*			
c. ɛgɛ		*!*		

5.6.3 Harmony in Trisyllables

(25) Opaque High Vowels & Right-alignment of –A

	MB	SY	Gloss	Pattern
a.	orúkɔ	orúkɔ	'name'	+ + –
b.	*ɔrúkɔ	*ɔrúkɔ		*– + –
c.	*ɔrúko	*ɔrúko		*– + +

(26) Opacity of High Vowels:

/ɛwúrɛ́/	*[+HI, –A]	MAX A PrHd	* –A +A PrWd	ID –A	*+A –A
a. ɛwúrɛ́	*!				
b. ɛwúrɛ́			*!	*	*
☞ c. ewúrɛ́				**	*
d. ewúré		*!		***	
e. ɛwúré			*!	**	

6 Alternative Accounts

- Alternative accounts for SY ATR harmony have been posited by Baković (2000) and Pulleyblank (1996).
  - Baković: the direction of harmony is determined by morphology.
    - Stems are never more than one syllable (all non-final vowels are prefixes).
    - Faithfulness to an intermediate sympathy candidate is needed.
  - Pulleyblank: uses ALIGN-R (root, –ATR).
    - Runs into same sour grapes issue with no obvious repair.
    - Additionally this account relies on a gradiently evaluated ALIGN constraint (categorical align doesn't work).

- Existential Faithfulness (Struijke, 2001) might seem applicable.
  - ∃-ID ATR can preserve exactly one underlying ATR feature, like MAX does in the present account.

(27) +A Proclitics Harmonize (same rankings & constraints assumed)

/é ʤɛ/	∃-ID –A	ID –A	* +A –A	ID +A
a. é ʤɛ			W	L
☞ b. ɛ́ ʤɛ				
c. é ʤe	W	W		L

(28) –A Enclitics Don't Trigger Harmony in Roots: Ranking Contradiction

/lé ɔ/	∃-ID –A	ID –A	* +A –A	ID +A
☞ a. lé ɔ				
b. lɛ́ ɔ			L	W
c. lé o	W	W	L	

- You would need root faithfulness or some other way to preserve ATR in root vowels. ∃-ID ATR isn't sufficient on its own.

References:

Archangeli, Diana, & Douglas Pulleyblank (1989) Yorùbá vowel harmony. *Linguistic Inquiry* 20: 173-217.

Archangeli, Diana & Douglas Pulleyblank (1994) Grounded Phonology. Cambridge, MA: MIT Press.

Baković, Eric. 2000. Harmony, dominance and control. Doctoral dissertation, Rutgers University.

Nespor, Marina & Irene Vogel (1986) Prosodic Phonology. Dordrecht: Foris.

Ọla, Ọlanike (1995) Optimality in Benue-Congo Prosodic Phonology and Morphology. Ph.D. dissertation, UBC.

Pulleyblank, Douglas (1996) Neutral vowels in Optimality Theory: A comparison of Yorùbá and Wolof. *Canadian Journal of Linguistics* 41, 295-347.

Pulleyblank, Douglas (2002) Harmony drivers: no disagreement allowed. In *Proceedings of the Twenty-eighth Annual Meeting of the Berkeley Linguistics Society*, 249-267. Berkeley Linguistics Society, Berkeley, California.