Downstep in Dagaare

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1. Outline

(1) Dagaare [dga] (Kennedy 1966, Hall 1977, Dakubu 1982, Delplanque 1983, Bodomo 1997, Ali, Grimm, and Bodomo 2021) belongs to the Western Oti-Volta group of Gur (Bendor-Samuel 1971, Manessy 1975, Naden 1989, Miehe 2012, Eberhard et al. 2020). The name "Mabia" is preferred to "Gur" by native speaker linguists.

(2) Dagaare is a "terraced-level" language (Welmers 1959, Clements 1979, Connell 2011) that contrasts H, L, and phonemic downstep ꜜH (Kennedy 1966). A three-way surface contrast is possible after H.

(a)	/∅-H/	bíí-rí	H-H	'child-PL'
(b)	/HL-H/	zú-ꜜrí	H-ꜜH	'head-PL'
(c)	/H-H/	yí-rì	H-L	'house-SG'

(3) Contrasting H, ꜜH, and L in verbs (hortative):

(a)	ó ꜜtáá ò	/H LH L/ →	H ꜜH L	'He should have it.'
(b)	ó kúlí	/H H/		'He should go home.'

(4) ꜜH ≠ M: ꜜH H sequences have level pitch; M H wrongly predicts a pitch rise; cf. Bimoba (Snider 1998) and Buli (Akanlig-Pare and Kenstowicz 2002).

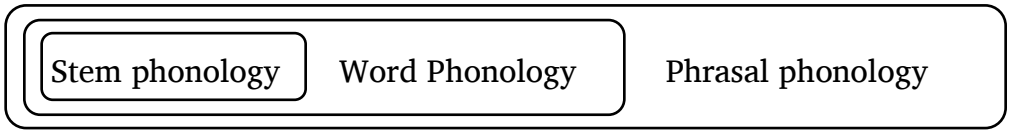
(a) kpa̰a̰ -ꜜṵ yí -rì [‾ – – _] *[‾ – ‾ _]
guineafowl-SG house-SG
'guineafowl's house'

(b) à bó-ꜜmá ámɛ̀ (lá k-ò búɔ́-rɔ̀) [_‾ – – _] *[_‾ – ‾ _]
DEF thing-PL these FOC (that-3P.SG want-IMPF)
'It is these things that he wants.'

(5) Where do downsteps come from (Leben 2018)? Two sources:
  (a) Floating L underlyingly specified on a root or an affix
  (Clements and Ford 1979, see, e.g., Pulleyblank 1986: 34 for Tiv)
  (b) The last H in a phonological word is downstepped
  (see, e.g., Childs 1995: 48 for Kisi, cf. Carlson 1993 for Supyire)

(6) The number of downsteps in an utterance is in principle unlimited (Rialland and Somé 2000, 2011), but we observe the following restriction:
  (a) Only one downstep per word is allowed.
  (b) If more would arise, the leftmost downstep blocks the rest.

(7) Assumption: Phonology is cyclic (Kiparsky 1982, 2000, 2015; Mohanan 1986; Pulleyblank 1986). Later processes make earlier processes opaque.



(8) Roadmap: (a) Descriptive generalizations stated as rules; (b) A stratal OT analysis; (c) A note on melody-locality (Jardine 2020).

2. Stem-level tone

(9) Stem-level processes (see Kenstowicz et al. 1988 for Moore):

NAME	PROCESS	ENVIRONMENTS
Meeussen's Rule	H H → H L	SG/PL, IMPF, nominalizer
H Spreading	∅ H → H H	nouns, adjectives
Default L Insertion	∅ H → L H	verbs, N + A compounds
Downstep	H (L) H → H ꜜH	lexically specified (L)

(10) Roots can be any of the following: toneless (= ∅), L, H, HL, LH. Suffixes (derivational, number/class, aspect) are usually H but can be LH.

(a)
wir -i	→	wìr -í	'horse-SG'	--
L H		L H		

(b) yi -ri → yí -rì ‘house-SG’ Meeussen’s Rule

H H H L

(c) pɔg-ɔ → pɔ́g-ɔ́ ‘woman-SG’ H Spreading

H H

(11) Evidence for toneless roots: H nouns preserve their tone in N+A compounds; toneless nouns become L, as in Moore (Kenstowicz, Nikiema and Ourso 1988), Dagbani (Hyman 1993), and Konni (Cahill 2007: 333).

	SINGULAR	PLURAL	‘bad N’	
(a)	bòŋó	bònní	bòŋfáá	‘donkey’
	wìɛ́	wɛ̀rí	wɛ̀fáá	‘farm’
(b)	kyúù	kyúúrì	kyúúˈfáá	‘moon’
	wɛ́gɛ̀	wɛ́grì	wɛ́gˈfáá	‘log’
(c)	bíé	bíírí	bìfáá	‘child’
	kúó	kúúrí	kùfáá	‘wild rat’

(12) Default L insertion in verbs; Leftward H Spreading in nouns, including nominalizations of toneless verbs (Anttila and Bodomo 2019).

tuu-ro → tùù-ró ‘follow-IMPF’ Default L Insertion

H L H (verb)

tuu-ro → túú-ró ‘follow-ER’ Leftward H Spreading

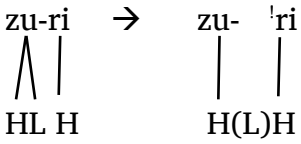
H H (noun)

(13) H spreading is limited to one syllable (one stem):

bi-tuu-ro → bi-túú-ró ‘child-follow-ER’

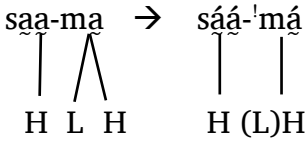
H L H

(14) HL root results in downstep:



'head-PL' cf. *zû* 'head.SG'

(15) LH suffix results in downstep:



'stranger-PL' cf. *sa̰á-nà̰* 'stranger-SG'

(16) In compounds, *zû* 'head.SG' triggers downstep, *sa̰á-* 'stranger' does not.

(a) à zú- ˈwóg-kpóngì nă (*zú-wóg-)
DEF head long big DEM
'that long big head'

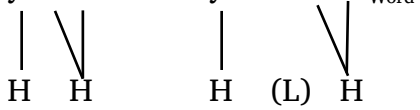
(b) à sa̰á- wóg-kpóngì nă (*sa̰á-ˈwóg-)
DEF stranger tall big DEM
'that tall big stranger'

3. Word-level tone

(17) A word-final H is downstepped, with some variability:

∅ → (L) / _ H]$_{\text{Word}}$ (Gussenhoven 2004: 110-113, cf. Gjersøe 2016)

(18) yí-rì 'house-SG'
yí-ˈfá-á 'house-bad-SG'



(19) This downstep cannot come from either /yi/ or /fa/:

(a) /yi/ is H since we get *yí-rì* (Meeussen, H-H → H-L), not **yí-ˈrì*

(b) /fa/ is underlyingly toneless as shown by compounds:

à bìbìl- fà- wóg nă
DEF child bad tall.SG that 'that bad tall child'

(20) (a) pɪ ˥-rʊʊ
H (L)H
'sheep-SG'
Downstep (stem)
H + LH → H˥H

(b) pɪɪ-rɪ
H L
'sheep-PL'
Meeussen (stem)
H → L / H _

(c) pɪ-˥sɪɪ-rɛ
H (L) H
'sheep-skin-ER'
Downstep (word)
H → ˥H / H _ ##

(21) Only H at the word edge is downstepped:
à bìbìl-wóg-kpóng-fíí-lɛ̀ nă
DEF kid tall big young-PL DEM
'those tall big young kids'

(22) The focus marker *lá* cliticizes to the verb before a non-pronominal object or predicative:

(a) ù dáá [bùrí ˥lá]$_{Word}$ à mírì
3P.SG PAST.2.DAYS soak.PERF FOC DEF rope
'S/he soaked the rope two or more days ago'

(b) à dą̰ą̰ nă ù nàngʼ dúg-rɔ̀ [é ˥lá]$_{Word}$ nʊ̀ɔ́
DEF pito REL 3P.SG REL brew-IMPF be FOC sweet
'The pito he is brewing is sweet'

(23) *lá* is not downstepped if there is a downstep earlier in the word.
Opacity 1: Stem-level downstep blocks word-level downstep.

(a) ù dà [bùrí ˥lá]$_{Word}$ à mírì
3P.SG PAST soak.PERF FOC DEF rope
'He soaked the rope'
bùrí ˥lá]$_{Word}$
H (L) H

(b) ù dà [bú˥rí lá]$_{Word}$ à kʊ̰̀ʊ̰́
3P.SG PAST fetch.PERF FOC DEF water
'He fetched the water'
bú˥rí lá]$_{Word}$
H(L)H H

(24) Constraints (cf. Hyman 1986 on Aghem):

(a) Multiple downsteps within a word are banned: *[…ꜜH…ꜜH…]$_{\text{Word}}$

(b) Downstep on the left blocks downstep on the right.

(25) Opacity 2: The 1P.SG object clitic *má* intervenes between the verb and the focus marker *lá*. The first downstep (ꜜ*má*) blocks the second (*ꜜ*lá*):

ù [[bùrí ꜜmá]$_{\text{Word}}$ lá]$_{\text{Word}}$

3P.SG soak.PERF me FOC

'He soaked me'

(26) An outstanding puzzle: H "absorption" in verbs (cf. Akanlig-Pare and Kenstowicz 2002 for Buli). /-ɛ̀é, -èé/ (LH) 'INTRANS.PERF'.

(a) ù kúꜜl-éé lá /kúl-/ 'go home', H

3P.SG go.home-INTR.PERF FOC

'She has gone home'

(b) ù dì-èè lá /di-/ 'eat', toneless

3P.SG eat-INTR.PERF FOC

'She has eaten'

(a) kul -ee la → kúꜜl -éé lá

H L H H H(L)H H Stem Level downstep

(b) di -ee la → dì-èè lá (*dì-éé lá)

L H H L H H absorption: L H H → L H

(27) Perhaps ꜜH is interpreted as L string-initially?

4. Postlexical tone

(28) No postlexical downstep: H ## H across a word boundary surfaces with level pitch.

à dɔ́ɔ́ pɔ́gɔ́ 'the man's woman'
L H H

(29) Future prefix particles have a trailing H (Kennedy 1966); cf. the future H suffix in Dagbani (Hyman and Olawsky 2004).

(a) nàá 'EMPH.FUT' (b) nà 'FUT' (c) kùng 'NEG.FUT'
L H L (H) L (H)

(30) Toneless verbs are L after *bá* 'NEG', but H after *kùng* 'NEG.FUT':

(a) ù dà nànɡ̀ bá bùrì à mírì
3P.SG PAST ADV NEG soak.PERF DEF rope
'He had not (yet) soaked the rope'

(b) ù dà nànɡ̀ kùng búrí à mírì
3P.SG PAST ADV NEG.FUT soak.PERF DEF rope
'He will not (yet) have soaked the rope'

(31) The toneless /gaa/ 'go' is L after *nàá* 'EMPH.FUT', but H after *nà* 'FUT':

(a) ù nàá gàà lá (b) ù nà gáá lá
3P.SG EMPH.FUT go FOC 3P.SG FUT go FOC
'he will willingly go' 'he will go'

(32) Opacity 3: No word-final downstep on *lá* because the H H]$_{Word}$ was created postlexically (postlexical phonology counterfeeds word level phonology):

ù nà gáá lá]$_{Word}$ NOT *gáá ˡlá]$_{Word}$
L L H H

(33) A toneless verb with a H suffix: dig-re ‘chase-IMPF’

H

(34) Opacity 4: H from *nà* (LH) ‘FUT’ creates a H-H sequence across a stem-suffix boundary, but Meeussen’s Rule (H-H → H-L) does not apply (postlexical phonology counterfeeds stem level phonology).

à	bíé	nà	díg-ré	ˡlá	sʊ̰ʊ́ˡŋ-ɑ́ɑ́	NOT *díg-rè lá
L	H	L H	H	H	H L H	

‘the child will be chasing the rabbit’

(35) The downstep in *díg-ré ˡlá* is correctly predicted: the stem-level *-ré* triggers word-level downstep (stem-level phonology feeds word-level phonology).

(36) Opacity 5: In clefts, *lá* ‘FOC’ cliticizes to the fronted subject, presumably at the phrasal level, and there is no downstep (postlexical phonology counterfeeds word-level phonology; see Féry 2013 for Ditammari).

ʊ́nɔ́ lá	là	wà
3P.SG.EMPH FOC	REP	come

‘It is he who has come again’

(37) Downstep may occur postlexically if it is underlying, as in *nă* ‘that’ (LH).

à	pɔ̀g	bààl	vìɛ̀l	bílé	ˡná
DEF	woman	slender	beautiful	small	that

‘that slender beautiful small woman’

(38) The ban on multiple downsteps only applies within words, not across words. Adjacent downsteps across words are fine:

(a)

à	dɔ̀ɔ̀	wóg	kpóng	ˡfáá	ˡná
DEF	man	tall	big	bad	that

‘that tall big bad man’

(b)

à	só	bìl	gɔ̀ng	fʊ́ɔ-ˡláá	ˡná
DEF	road	small	crooked	narrow	that

'that small crooked narrow road'

5. Summary

(39) Dagaare downstep can be <u>underlying</u> or <u>prosodic</u>.

(40) Evidence for level ordering:
- (a) At the stem level H-H dissimilates (H H → H L).
- (b) At the word level H#H survives with downstep (H H → H ˡH).
- (c) At the postlexical level H##H survives intact.

(41) Evidence for cyclicity:
- (a) Only one downstep per phonological word is allowed.
- (b) If more would arise, inner downstep blocks outer downstep.

6. OT analysis

6.1 Stem level tone

(42) (a) Undominated constraints:

OCP(H)	'No adjacent H tones' (e.g., Hyman 2011: 1096)
*CONTOUR	'No contours'
MAX(T), DEP(T)	'No tone deletion, no tone insertion'
IDENT-ROOT(T)	'Root tone values cannot be changed (H vs. L).'
ALIGN-RIGHT(T)	'The stem-final syllable must have a tone.'

(b) Dominated constraints:

*FLOAT	'No floating tones'
*SPREAD	'No spreading'
*TONELESS	'No toneless syllables'
IDENT(T)	'Tone values cannot be changed (H vs. L)'

(43) At the stem level, H-H is avoided by dissimilation, not deletion or insertion. Suffix tones dissimilate, not root tones. No contours. L tones can float.

(44) Dissimilation (= Meeussen's Rule) in number (noun) and imperfective (verb): /yí-rí/ → *yí-rì* 'house-SG', /kúl-ó/ → *kúl-ò* 'go.home-IMPERF'.

/yi- ri/ H H	OCP(H)	DEP(T)	*FLOAT	*SPREAD	*TONELESS	IDENT(T)
a. yi-ri H H	1!					
b. yi-ri H(L)H		1!	1			
c. ☞ yi-ri H L						1
d. yi-ri H (L)			1	1		1

(45) Downstep from an underlying L: /zû-rí/ → *zú-ꜜrí* 'head-PL'

/zu -ri/ H L H	OCP(H)	DEP(T)	*FLOAT	*SPREAD	*TONELESS	IDENT(T)
a. ☞zu-ri H(L)H			1			
b. zu-ri H L (L)			1			1

(46) A suffixal H spreads onto a toneless root in nouns but not in verbs. Analysis: Morphologically conditioned ranking of *TONELESS and *SPREAD, see, e.g., Jenks and Rose 2015; Sande, Jenks, and Inkelas 2020.

(47) *túú-ró* 'follow-ER' vs. *tùù-ró* 'follow-IMPF'

(a) Noun: *TONELESS » *SPREAD

(b) Verb: *SPREAD » *TONELESS

/tuu-ro/ H	OCP(H)	DEP(T)	*FLOAT	*SPREAD	*TONELESS	ID(T)
a. ☞ tuu-ro (noun) H				1!		
b. ☞ tuu-ro (verb) H					1!	

(48) /kúlí/ + H → *kúlí* 'go.home-PERF', where perfective = H. The candidate **kúlì* violates the undominated IDENT-ROOT(T).

/kuli/ H -H	OCP(H)	DEP(T)	*FLOAT	*SPREAD	*TONELESS	IDENT(T)
a. kuli H H	1!					
b. kuli H(L)H		1!	1			
c .☞ kuli H (L)			1	1		1

6.2 Word level tone

(49) Word-level downsteps are epenthetic (L) "boundary tones" (Gjersøe 2016). Word-final H H sequences are avoided by (L) insertion, not dissimilation.

(50) The difference between stem and word grammars:

Stem:	DEP(T) » IDENT(T)	Dissimilation, no (L) insertion
Word:	IDENT(T) » DEP(T)	(L) insertion, no dissimilation

(51) *[…ˡH…ˡH…]$_{\text{Word}}$ 'No multiple downsteps' (undominated)

(52) Downstep from (L)-insertion, e.g., *bùrí ˡlá* 'soak.PERF FOC'. "=" marks clitic boundary.

/buri=la/ (H H)	OCP(H)	IDENT(T)	*FLOAT	*SPREAD	*TONELESS	DEP(T)
a. buri=la (H H)	1!					
b. ☞ buri=la (H(L)H)			1			1
c. buri=la (H L)		1!				

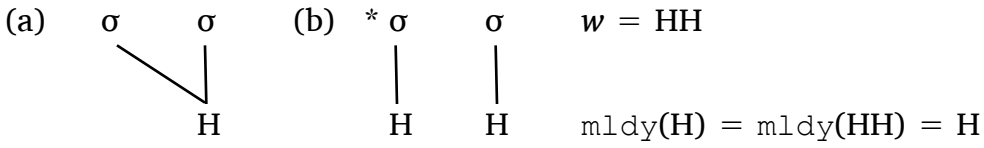
7. A note on melody-locality

(54) Jardine (2020): Tonal well-formedness patterns are MELODY-LOCAL, i.e., they are describable with the intersection of
  (a) constraints on sequences of consecutive TBUs
  (b) constraints on sequences of tones in the melody

(55) Constraints either refer to the string of TBUs or to the melody but cannot refer to arbitrary associations between them.

(56) Downstep is just another symbol, e.g., "!". The constraint *[…ˡH…ˡH…]$_{\text{Word}}$ can be straightforwardly stated in Jardine's system on the TBU string.

(57) Puzzle: Dagaare allows (a), but not (b) in the lexical phonology:



(58) From the TBU perspective both are HH. From the melody perspective both are H, yet (a) is permitted, (b) is not. How to state the difference?

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