Sub-Saharan Africa

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The Oxford Handbook of Language Prosody
Edited by Carlos Gussenhoven and Aoju Chen

Print Publication Date: Dec 2020 Subject: Linguistics, Phonetics and Phonology
Online Publication Date: Feb 2021 DOI: 10.1093/oxfordhb/9780198832232.013.11

Abstract and Keywords

This chapter maps out the tonal, accentual, and intonational properties of sub-Saharan African languages, focusing particularly on Niger-Congo. It distinguishes tone systems by the number of contrastive tone heights and contours and their tonal distributions, as well as grammatical functions of tone. It considers positional prominence effects potentially analysed as word accent and concludes with discussion of both intonational pitch and length marking syntactic domains and clause types.

Keywords: sub-Saharan Africa, Niger-Congo, tone systems, tone heights, contours, tonal distributions, word accent, intonational pitch

12.1 Introduction

IN this chapter we survey the most important properties and issues that arise in the prosodic systems of sub-Saharan Africa. While our emphasis is on the vast Niger-Congo (NC) stock of approximately 1,500 languages, much of what is found in NC is replicated in Greenberg's (1963) other major stocks: Nilo-Saharan, Khoisan, and the Chadic, Cushitic, and Omotic subgroups of Afro-Asiastic. As we shall point out, both the occurrence of tone and other properties that are found in the prosodic systems of sub-Saharan Africa show noteworthy areal distributions that cut across these groups. We start with a discussion of tone (§12.2), followed by word accent (§12.3) and then intonation (§12.4).

12.2 Tone

Tone is clearly an ancient feature across sub-Saharan Africa, with the exception of Afro-Asiatic (e.g. Chadic), which likely acquired tone through contact with NC and/or Nilo-Saharan (Wolff 1987: 196–197). It is generally assumed that Proto-NC, which existed somewhere between 7,000 and 10,000 years ago, already had tone, most likely with a contrast between two heights, H(igh) and L(ow) (Hyman 2017). First, almost all NC languages are

tonal, including the controversial inclusions such as Mande, Dogon, and Ijoid. Second, non-tonal NC languages are geographically peripheral and have lost their tone via natural tone simplification processes (cf. Childs 1995) and/or influence from neighbouring non-tonal languages (cf. Hombert 1984: 154–155). This includes not only Swahili in the East but also Northern Atlantic (Fula, Seereer, Wolof, etc.), Koromfé (Northern Central Gur; Rennison 1997: 16), and (outside NC) Koyra Chiini (Songhay; Heath 1999: 48), which could be the effect of contact with Berber or Arabic, either directly or through Fula (Childs 1995: 20). The only non-peripheral cases concern a near-continuous band of Eastern Bantu languages, such as Sena [Mozambique], Tumbuka [Malawi] (Downing 2017: 368), and Nyakyusa [Tanzania], which are not likely to have lost their tones through external contact. Since (p. 184) tonogenesis usually if not always produces a binary contrast, languages with multiple tone heights have undergone subsequent tonal splits conditioned either by laryngeal features, such as the obstruent voicing of so-called depressor consonants, as in Kru (see Singler 1984: 74 for Wobe) or by the tones themselves, such as raising of L to M(id) before a H tone that then subsequently drops out, as in Mbui [Grassfields Bantu; Cameroon] (Hyman and Schuh 1974: 86).

12.2.1 Tonal inventories

Numerous sub-Saharan languages still show a binary contrast in their tones, which may be analysed as equipollent /H/ vs. /L/, e.g. Ga [Kwa; Ghana] /lá/ ‘blood’, /là/ ‘fire’ (Kropp Dakubu 2002: 6), privative /H/ vs. Ø, e.g. Haya [Bantu; Tanzania] /-lí-/ ‘eat’ vs. /-si-/ ‘grind’ (Hyman and Byarushengo 1984: 61), or (more rarely) privative /L/ vs. Ø, e.g. Malinke de Kita [Mande; Mali] /nà/ ‘to come’ vs. /bo/ ‘to exit’ (Creissels 2006: 26). As pointed out by Clements and Rialland (2008: 72–73), languages with three, four, or even five contrastive pitch heights tend to cluster along a definable East–West Macro-Sudan Belt (Güldemann 2008) starting in Liberia and Ivory Coast, e.g. Dan (Vydrin 2008: 10), and ending in Ethiopia, where Bench also contrasts five tone heights: /kā̋r/ ‘clear’, /kárí/ ‘inset or banana leaf’, /kār/ ‘to circle’, /kàr/ ‘wasp’, and /kȁr/ ‘loincloth’ (Rapold 2006: 120). Most of those spoken south of the Macro-Sudan Belt (Güldemann 2008) contrast two tone heights (see Map 12.1 in the plate section).[1]

Another area of high tonal density is to be found in the Kalahari Basin region (Güldemann 2010) in southwestern Africa, where languages formerly subsumed under the label ‘Khoisan’ have up to four level tones: the Kx’a language ǂ’Amkoe (Gerlach 2016) and the Khoe-Kwadi languages Khwe (Kilian-Hatz 2008: 24–25), G|ui (Nakagawa 2006: 32–60), and Ts’ixa (Fehn 2016: 46–58) have three tone heights (H, M, L), while Khoekhoe (Khoe-Kwadi: Haacke 1999: 53) and the Ju branch of Kx’a (formerly ‘Northern Khoisan’: Dickens 1994; König and Heine 2015: 44–48) have four (Super-H, H, L, Super-L). Only one Kalahari Basin language (the West dialect of Taa, aka !Xóõ) has been analysed as opposing two tone heights (H vs. L: Naumann 2008).

Besides the number of tone heights, African tone system inventories differ in whether they permit contours or not, and, if permitting, which ones are present. Map 12.2 (see

plate section) shows that R(ising) and F(alling) tonal contours tend more to appear in languages in the Macro-Sudan Belt.

In terms of the number of contour tones, African languages have been reported with up to five falling tones, e.g. Yulu HM, HL, H$^{\downarrow}$L, ML, M$^{\downarrow}$L (Boyeldieu 1987: 140), and five rising tones, e.g. Wobe 31, 32, 41, 42, 43, where 1 is the highest tone (Bearth and Link 1980: 149).

Another difference in inventory concerns whether a language allows downstepped tones or not. Whereas some languages contrast the three tone heights /H/, /M/, and /L/, which in principle can combine to produce nine possibilities on two syllables and 27 possibilities on (p. 185) three, as in Yoruba (Pulleyblank 1986: 192–193), others contrast /H/, /L/, and a downstepped $^{\downarrow}$H, which usually is contrastive only after another ($^{\downarrow}$)H. As seen in Map 12.3 (see plate section), a smaller number of languages have contrastive $^{\downarrow}$M and $^{\downarrow}$L.

While in most African languages with downstep an underlying L tone between two H tones results in the second H surfacing as $^{\downarrow}$H, an input H-H sequence may also become H-$^{\downarrow}$H, as in Shambala (Odden 1982) and Supyire (Carlson 1983). A number of underlying /H, M, L/ languages lack $^{\downarrow}$H but have downstepped $^{\downarrow}$M, which results from a wedged L tone, e.g. Yoruba (Bamgbọṣe 1966), Gwari (Hyman and Madaji 1970: 16), and Gokana (Hyman 1985: 115). Downstepped L, on the other hand, is more likely to derive from a lost H tone, as in Bamileke-Dschang (Hyman and Tadadjeu 1976: 92). $^{\downarrow}$H is by far the most common downstepped tone, and a three-way H vs. $^{\downarrow}$H vs. L contrast is the most common downstep system. On the other hand, Ghotuo is reported to have both $^{\downarrow}$M and $^{\downarrow}$L, but no $^{\downarrow}$H (Elugbe 1986: 51). Yulu (Boyeldieu 2009), which is said to have an ‘infra-bas’ tone, may be best analysed as having $^{\downarrow}$L. Similarly, the contrastive L falling tone of Kalenjin may be best analysed as a L$^{\downarrow}$L contour tone (Creider 1981). While $^{\downarrow}$H occurs throughout sub-Saharan Africa, $^{\downarrow}$M and $^{\downarrow}$L are more commonly found in the eastern part of the Macro-Sudan Belt (e.g. Nigeria, Cameroon, Central African Republic).

12.2.2 The representation of tone

The density of the tonal contrasts depends on whether a contrastive tone is required on every tone-bearing unit (TBU), instead of allowing some or many TBUs to be toneless. In the most dense system, the number of contrastive tone patterns will equal the number of contrastive tones multiplied by the number of TBUs. Thus, in a /H, L/ system there should be two patterns on a single TBU, four patterns on two TBUs, and so on (and perhaps more patterns if tonal contours are allowed). A sparse tonal situation tends to arise in languages that have longer words but have a more syntagmatic tone system. In these languages, single tones, typically privative H, can be assigned to a specific position in a lexically defined group of stems or words, as in Chichewa, where an inflected verb stem can be completely toneless or have a H on its penultimate or final syllable. It is such systems that lend themselves to a privative /H/ vs. Ø analysis.

In another type of system often referred to as melodic, the number of TBUs is irrelevant. In Kukuya, for instance, verb stems can have any of the shapes CV, CVV, CVCV, CVVCV, or CVCVCV, i.e. up to three morae over which five different tonal melodies are mapped: H, L, LH, HL, or LHL (Paulian 1975). Since a CV TBU can have any of the LH, HL, or LHL contours, analysed as sequences of tones, Kukuya unambiguously requires a /H/ vs. /L/ analysis. Other languages can reveal the need for a /H/ vs. /L/ analysis by the presence of floating tones (e.g. many Grassfields Bantu languages).

12.2.3 Phonological tone rules/constraints

Almost all sub-Saharan languages modify one or another of their tones in specific tonal environments. By far the most common tone rule found in NC languages is perseverative tone spreading, which most commonly applies to H tones, then L tones, then M tones. (p. 186) In languages that have privative /H/ vs. Ø, only H can spread, as in much of Eastern and Southern Bantu, and similarly regarding L in /L/ vs. Ø systems such as Ruwund (Nash 1992–1994). Such spreading can be either bounded, affecting one TBU to the right, or unbounded, targeting either the final or penultimate position within a word or phrase domain. In some languages both H and L tone spreading can result in contours being created on the following syllable, as in the Yoruba example /máyọ̀ mí rà wé/ → [máyọ̌ mǐ râ wě] ‘Mayomi bought books’ (Laniran and Clements 2003: 207). In languages that do not tolerate contours, the result is doubling of a tone to the next syllable. This is seen particularly clearly in privative H systems, e.g. Kikerewe [Bantu; Tanzania] /ku-bóh-el-an-a/ → [ku.bó.hé.la.na] ‘to tie for each other’ (Odden 1998: 177). In some cases the original tone delinks from its TBU, in which case the result is tone shifting, as in Jita /ku-βón-er-an-a/ → [ku-βon-ér-an-a] ‘to get for each other’ (Downing 1990: 50). Tone anticipation is much less common but does occur, e.g. Totela /o-ku-hóh-a/ → [o-kú-hoh-a] ‘to pull’ (Crane 2014: 65).

Other languages may raise or lower a tone, e.g. a /L-H/ sequence may be realized L-M as in Kom [Bantoid; Cameroon] (Hyman 2005: 315–316) or M-H as in Ik [Eastern Sudanic; Uganda] (Heine 1993: 18), while the H in a /H-L/ sequence may be raised to a super-high level, as in Engenni [Benue-Congo; Nigeria] /únwónì/ → [únwőnì] ‘mouth’ (Thomas 1974: 12). Finally, tone rules may simplify LH rising and HL falling tones to level tones in specific environments. For more on the nature of tone rules in African languages see Hyman (2007) and references cited therein.

12.2.4 Grammatical functions of tone

One of the most striking aspects of tone across Africa is its frequent use to mark grammatical categories and grammatical relations. Three types of grammatical tone (GT) are illustrated below from Kalabari [Ijoid; Nigeria] (Harry and Hyman 2014). The first is *morphological* GT at the word level, which turns a transitive verb into an intransitive verb by replacing lexical tones with a LH tone melody. In this case, the only mark of the grammatical category is the GT, with no segmental exponence, illustrated in (1).

(1)

kán	H	'demolish'	→	kàán	LH	'be demolished'
kíkí$^{\downarrow}$má	HH$^{\downarrow}$H	'hide'	→	kìkìmá	LLH	'be hidden'

The second, *syntactic* type occurs at the phrase level. As shown in (2), when a noun is possessed by a possessive pronoun (e.g. /ìnà/ 'their'), the lexical tones of the noun are replaced with a HLH melody, realized [H$^{\downarrow}$H] on two syllables.

(2)

námá	HH	'animal'	→	ìnà ná$^{\downarrow}$má	H$^{\downarrow}$H	'their animal'
bélè	HL	'light'	→	ìnà bé$^{\downarrow}$lé	H$^{\downarrow}$H	'their light'

Unlike the first case, here GT only secondarily expones the grammatical category 'possessive', and must co-occur with a segmentally overt possessive pronoun. Both morphological and syntactic types are referred to as 'replacive tone' (Welmers 1973: 132–133). Finally, the third type is also phrase level, but is crucially different in that the GT does not replace lexical tone but rather co-occurs with it. For example, still in Kalabari the future auxiliary /ɓà/ assigns (p. 187) /H/ to a preceding verb, which surfaces as [LH] if it has /L/: /sì/ '(be) bad' → námá sìí ɓà 'the animal will become bad'.

While all tonal languages in Africa exhibit GT, typically robustly, we know of only one language with only lexical tone. GT usage cuts across other typological dimensions such as tone inventory, degree of analyticity/syntheticity, and the headedness parameter, and can express virtually all grammatical categories and many distinct types of grammatical relations, including derivation (valency, word class changes, and more), and all major inflectional categories such as number, case, tense, aspect, mood, subject agreement, and polarity, as in Aboh [Benue-Congo; Nigeria]: [ò jè kò] 's/he is going', [ó jé kò] 's/he is not going' (L. Hyman, personal notes). One robust pattern found across Africa involves GT marking 'associative' (roughly, genitive and compound) constructions, e.g. in Mande (Creissels and Grégoire 1993; Green 2013), Kru (Marchese 1979: 77; Sande 2017: 40), much of Benue-Congo, and (outside of NC) Chadic (Schuh 2017: 141), the isolate Laal (Lionnet 2015), and many Khoe-Kwadi languages (Haacke 1999: 105–159; Nakagawa 2006: 60–80, among others).

In the verbal domain, tone often only has a grammatical function if verb roots lack a lexical tonal contrast. Table 12.1 illustrates this with the closely related Bantu languages Luganda and Lulamogi (Hyman 2014a). Both exhibit a lexical tonal contrast in the nominal domain, but only Luganda does so in the verbal domain.

Table 12.1 Grammatical tone in a language without a tone contrast in the verb stem (Luganda) and its absence in a language with such a tone contrast (Lulamogi)

		Luganda		Lulamogi	
Nouns		e-ki-zimbe		é-ki-zimbé	‘building’
	≠	e-ki-zîmba	≠	é-kí-zîmbá	‘boil, tumor’
Verbs		o-ku-bal-a		ó-ku-bal-á	‘to count’
	≠	o-ku-bál-a	=	ó-ku-bal-á	‘to produce, bear fruit’

The lack of lexical tone contrasts in the verbal domain is common across African tonal languages, such as in Kisi [South Atlantic; Sierra Leone] (Childs 1995: 55), Konni [Gur; Ghana] (Cahill 2000), CiShingini [Kainji; Nigeria] (N. Rolle and G. Bacon, field notes), and Zande [Ubangi; Central African Republic] (Boyd 1995), not to mention many Bantu languages where tones are assigned by the inflectional morphology (tense-aspect-mood-negation), e.g. Lulamogi /a-tolók-a/ ‘s/he escapes’ vs. /á-tolok-é/ ‘may s/he escape!’.

At least one language, Chimwiini [Bantu; Somalia] has only GT and no lexical tone in any domain (Kisseberth and Abasheikh 2011). Here, a single final or penultimate privative H tone is determined by the grammar, e.g. [ji:lé] ‘you SG. ate’, [jí:le] ‘s/he ate’ (Kisseberth and Abasheikh 2011: 1994), and although the above contrast derives from the inflectional morphology of the verb, it is realized phrasally: [jile ma-tu:ndá] ‘you SG. ate fruit’, [jile ma-tú:nda] ‘s/he ate fruit’. Kisseberth and Abasheikh (2011) analyse phrase-penultimate H as the default, with the final H in these examples being conditioned by first (and second) person subject marking. Other final H tones are assigned by relative clauses, conditional clauses introduced by /ka-/, the negative imperative, and the conjunction /na/ ‘and’ (Kisseberth and Abasheikh 2011: 1990–1992).

(p. 188) The interaction of GT with lexical tone and other GTs is extremely rich and varied. One profitable way of illustrating complex GT interaction is through tonological paradigms showing which morphosyntactic features assign which tones. These assignments often conflict. It is profitable to view GT competition as ‘dominance effects’ (Kiparsky 1984; Inkelas 1998; Kawahara 2015). As implemented in Rolle (2018), dominant GT wins systematically in competition with lexical tone resulting in tonal replacement, as was exemplified in the first two types above from Kalabari (1–2). In contrast, non-dominant GT does not systematically win over other tones, often resulting in tones from two distinct morphemes co-occurring together, as in the third type in Kalabari shown above with the future auxiliary /ɓà/. Dominant and non-dominant GT can be interleaved in morphologically complex words, resulting in ‘layers’ of GT. The following example comes from Hausa (Inkelas 1998: 132). In (3a), dominant affixes /-íí/ AGENT and /-ìyáá/ FEM replace any tones in the base and assign a L and H melody, respectively. Non-dominant affixes /má-/ NOMINALIZER and /-r/ REF either assign no tone, or assign a floating tone which docks to the edge but does not replace tones, as shown in (3b).

(3)

a.	[[[má-	[káràntá	-^{L}íí]]	-^{H}ìyáá]	-^{L}r]
	NML-	read	-AGENT	-FEM	-REF
	'the reader (f.)'				

b.	Dom	káràntá -^{L}íí	→	kàràncíí
	Non-dom	má- kàràncí	→	mákàràncíí
	Dom	mákàràncíí -^{H}ìyáá	→	mákáráncìiyáá
	Non-dom	mákáráncìiyáá -^{L}r	→	mákáráncìiyâr

GT interaction can be very complex and may involve intricate rules of resolution not easily captured as dominant versus non-dominant GT, as in the case of the grammatical H tones in Jita [Bantu; Tanzania] (Downing 2014). In addition, tone may exhibit allomorphic melodies conditioned by properties of the target. For example, in Tommo So [Dogon; Mali] (McPherson 2014) possessive pronouns assign a H melody to bimoraic targets but a HL melody to longer targets. Thus, /bàbé/ 'uncle' → [mí bábé] 'my uncle' vs. /tìrɛ̀-àn-ná/ 'grandfather' → [mí tírɛ̀-àn-nà] 'my grandfather'.

Although virtually all sub-Saharan tonal languages exhibit both lexical tone and GT, the functional load of each can vary significantly. Many statements of African languages explicitly note the lack of tonal minimal pairs, as in the Chadic languages Makary Kotoko (Allison 2012: 38) and Goemai (Tabain and Hellwig 2015: 91); for Cushitic as a whole (Mous 2009), e.g. Awngi (Joswig 2010: 23–24); and in Eastern Bantu languages such as Luganda and Lulamogi (see Table 12.1). Other languages have more frequent minimal pairs, such as the oft-cited minimal quadruplet in Igbo: /àkwà/ 'bed', /àkwá/ 'egg', /ákwà/ 'cloth', /ákwá/ 'crying'. The functional load of GT similarly varies across Africa.

12.3 Word accent

While we have a great understanding of tone in African languages, there has been considerably less clarity about the status of word stress. In this section we adopt word accent (WA) as a cover term to include word stress and other marking of one and only one most prominent (p. 189) syllable per word. In the most comprehensive survey of WA in sub-Saharan Africa to date, the studies cited by Downing (2010) describe individual African languages with WA assigned at the left or right edge, on the basis of syllable weight, or by tone. However, many if not most authors either fail to report word stress or explicitly state that there is no stress, rather only tone. Thus in Lomongo, 'stress is entirely eclipsed by the much more essential marking of tones' (Hulstaert 1934: 79, our translation). Some of the relatively few non-tonal languages do appear to have WA, such as initial (~ second syllable) in Wolof (Ka 1988; Rialland and Robert 2001) and penultimate (~ antepenultimate) in Swahili (Vitale 1982). Other non-tonal languages appear not to have WA at all, but rather mark their prosody at the phrase level, such as by lengthening the vowel of the phrase-penultimate syllable and assigning a H tone to its first mora in Tum-

buka (Downing 2017: 369–370). Kropp (1981) describes the stylistic highlighting (‘stress’) of different syllables within the pause group in Ga [Kwa; Ghana].

While descriptions of many tone languages do not mention stress or accent, we do find occasional attempts to predict WA from tone. In Kpelle, Welmers (1962: 86) shows that basic (unaffixed, single-stem) words can have one of five tone melodies H, M, HL, MHL, and L. He goes on to say that when these melodies are mapped on bisyllabic words as H-H, M-M, H-L, M-HL, and L-L, accent falls on the initial syllable if its tone is H or L, otherwise on the second syllable if its tone is HL. Words that are M-M are ‘characterized by lack of stress’ (Welmers 1962: 86). However, the fact that some words are accentless makes the analysis suspect, as obligatoriness is a definitional property of stress in non-tone languages. Since the MHL and M melodies derive from /LHL/ and /LH/, respectively (Hyman 2003: 160), Welmers’ accent would have to be a very low-level phenomenon, assigned after the derivation of LH → M. We suspect that other claims of WA based on tonal distinctions are equally due to the intrinsic properties of pitch and other factors unrelated to WA.

While in cases such as Kpelle there is a lack of additional phonetic or phonological evidence for WA, in a number of sub-Saharan African languages the stem- (or root-)initial syllable is an unambiguously ‘strong’ position licensing more consonant and vowel contrasts than pre- and post-radical positions, where ‘weaker’ realizations are also often observed. Perhaps the best-known case is Ibibio, whose consonant contrasts are distributed within the prosodic stem as in (4) (Urua 2000; Harris and Urua 2001; Akinlabi and Urua 2006; Harris 2004).

(4)

a. prosodic stem structures:	CV, CVC, CVVC, CVCV, CVVCV, CVCCV												
b. stem-initial consonants:	b	f	m	t	d	s	n	y	ɲ	k	ŋ	kp	w
c. coda consonants:	p		m	t			n	y		k	ŋ		
d. intervocalic VCV:	β		m	ɾ			n			ɣ	ŋ		
e. intervocalic VCCV:	pp		mm	tt			nn	yy		kk	ŋŋ		

As indicated, 13 consonants contrast stem-initially versus six or seven in the other positions. The intervocalic weakening of stops to [β, ɾ, ɣ] only between the two stem syllables (not between prefix and stem, for instance), as well as the realization of /i, u/ as [ɨ, ʌ] in stem-initial position, points to the formation of a prosodic stem with a strong-weak foot structure: /díp/ → [dɨ́p] ‘hide’, /díp-á/ → [dɨ́βé] ‘hide onseself’. In addition, although the first syllable can have any of the six vowels /i e u o ɔ a/, the second syllable is limited to a single vowel analysable as /a/, which assimilates to the vowel of the first syllable (cf. [tòβó] ‘make an order’, [dééβ-é] ‘not scratch’, [kɔ́ŋ-ɔ́] ‘be hung’).

(p. 190) Such distributional asymmetries are an important and widespread areal feature in West and Central Africa, in a zone extending from parts of Guinée, Côte d’Ivoire, and Burkina Faso in the West to Gabon and adjacent areas in the two Congos, partly overlap-

ping with what Güldemann (2008) identifies as the core of the Macro-Sudan Belt. Most languages in this stem-initial prominence area are from the NC stock. However, the pattern whereby the initial syllable is favoured with consonant and vowel contrasts while the second is starved of them is an areal feature and cuts across families. It is strongest in the centre of the area (i.e. on both sides of the Nigeria–Cameroon border) and decreases towards the periphery. Most peripheral NC languages have very few such distributional asymmetries (e.g. North-Central Atlantic, Bantu south of the Congo), while it is present in Northwest Bantu, but not (or not as much) in the rest of Bantu. Finally, most non-NC languages with similar distributional asymmetries are found at the periphery of the area, where they are likely to have acquired stem-initial prominence through contact with NC languages, such as Chadic languages spoken on the Jos Plateau next to Benue-Congo languages with stem-initial prominence, including Goemai, which has a long history of contact with Jukun (cf. Hellwig 2011: 6). Similarly, the initial-prominent Chadic languages Ndam (Broß 1988) and Tumak (Caprile 1977) and the isolate Laal (Boyeldieu 1977; Lionnet, personal notes) are spoken in southern Chad next to Lua and Ba, two Adamawa languages with strong stem-initial prominence (Boyeldieu 1985; Lionnet, personal notes). Nilo-Saharan languages, most of which are spoken far from the stem-initial prominence area, do not seem to have similar distributional asymmetries. This is also true of Saharan or Bongo-Bagirmi languages, spoken relatively close to the area. Stem-initial prominence cued by segmental distributional asymmetries thus seems to be an areal feature within the Macro-Sudan Belt, affecting mostly NC languages (cf. Table 12.2 section a), but also neighbouring unrelated languages through contact (cf. Table 12.2 section b).

However, as in the case of multiple tone heights, the Kalahari Basin area acts as a southern counterpart to the Macro-Sudan Belt in being an area of strong stem-initial prominence. In most of the languages formerly known as ‘Khoisan’, lexical stems strictly conform to the phonotactic templates $C(C)_1V_1C_2V_2$, $C(C)_1V_1V_2$, and $C(C)_1V_1N$. The stem may start with virtually any consonant in the (sometimes very large) inventory, including clicks, and any of the attested clusters (only a few sonorants are not attested stem-initially), while only a handful of consonants, mostly sonorants, are attested in C_2 (cf. Table 12.2 section c).

Table 12.2 Stem-initial prominence marked by distributional asymmetries

a.	Mande	Guro (Vydrin 2010), Mano (Khachaturyan 2015)
	Gur	Konni (Cahill 2007), Koromfe (Rennison 1997)
	Gbaya	Gbaya Kara Bodoe (Moñino and Roulon 1972)
	Adamawa	Lua (Boyeldieu 1985), Kim (Lafarge 1978), Day (Nougayrol 1979), Mundang (Elders 2000), Mambay (Anonby 2010), Mumuye (Shimizu 1983), Dii/Duru (Bohnhoff 2010)
	Plateau	Izere (Blench 2001; Hyman 2010c), Birom (Blench 2005; Hyman 2010c)
	Cross River	Ibibio (Urua 2000; Harris and Urua 2001; Akinbiyi and Urua 2002; Harris 2004), Gokana (Hyman 2011)
	NW Bantu	Kukuya (Paulian 1975; Hyman 1987), Tiene (Ellington 1977; Hyman 2010c), Basaa (Hyman 2008), Eton (Van de Velde 2008)
b.	Chadic	Goemai (Hellwig 2011), Tumak (Caprile 1977), Ndam (Broß 1988)
	Isolate	Laal (Lionnet, personal notes)
c.	‘Khoisan’	(Beach 1938; Traill 1985; Miller-Ockhuizen 2001; Nakagawa 2010)

(p. 191) The initial stem syllable may also affect how tone rules apply (e.g. attracting a H tone to them, as in Giryama; Volk 2011b) or stopping the further spread of H, as in Lango, where Noonan (1992: 51) states that ‘primary stress in Lango is invariably on the root syllable’. Since stem-initial stress is common cross-linguistically, it is natural to identify such stem-initial effects with the broader concept of WA, despite the otherwise elusive nature of WA in sub-Saharan African languages. For further discussion see Hyman (2008: 324–334), Downing (2010: 408–409), Hyman et al. (2019), and references cited therein.

12.4 Intonation

Focusing on the prosodic features that mark sentence type or syntactic domain, we follow Ladd's (2008b) definition: 'Intonation, as I will use the term, refers to the use of *suprasegmental* phonetic features to convey "post-lexical" or *sentence-level* pragmatic meanings in a *linguistically structured* way' (italics retained from Ladd). Following Ladd, we leave out a discussion of paralinguistic functions of intonation, such as enthusiasm or excitement, as achieved by tempo and pitch range modulations.

A number of African languages distinguish sentence types with intonational pitch contours, often in addition to the lexical and GTs or WA in the language. Other prosodic features, such as length, are also used to mark phrasal boundaries. However, some highly tonal languages in Africa show little to no effect of intonation at all. Perhaps expectedly, there seems to be a correlation between high numbers of contrastive lexical and grammatical level tones and a lack of intonational contours to mark sentence type. For example, Connell (2017) describes the prosodic system of Mambila, a Bantoid language (Nigeria and Cameroon) with four contrastive tone heights in addition to GT marking, as having no consistent f0 contribution in indicating sentence type (i.e. declarative sentence vs. polar question). This section surveys intonational tendencies in polar questions, declarative sentences, and focus constructions across sub-Saharan African languages.

12.4.1 Pitch as marking sentence type or syntactic domain

One particularly salient property of intonation contours in a wide range of sub-Saharan African languages is the lack of a rising right-edge boundary tone in polar questions (Clements and Rialland 2008: 74–75; Rialland 2007, 2009). However, even languages that lack a H% in polar questions by and large show pitch raising in some respect, either through register raising (as in Hausa and Lusoga) or by a raising of a H before a final L%.

In a sample of over 100 African languages, Clements and Rialland (2008) found that more than half lack an utterance-final high or rising contour in polar questions. A number of languages show no intonational difference between declarative sentences and polar questions. Others make use of utterance-final low or falling intonation in polar questions. Specifically, such marking of polar questions by a final boundary tone L% is found in most Gur languages, as well as a number of Mande, Kru, Kwa, and Edoid languages, suggesting that it is an areal feature of West Africa. Clements and Rialland (2008: 77) found no Bantu, (p. 192) Afro-Asiatic, or Khoisan languages that mark polar questions with a final L%,[2] though see Rialland and Embanga Aborobongui (2017) on Embosi, a Bantu language with a HL% falling boundary tone in polar questions. Further east in Lusoga, another Bantu language, there is a right-edge H% tone in declaratives, but a L% in interrogatives and imperatives (Hyman 2018). All of the verb forms and the noun 'farmers' in (5a) are underlyingly toneless, while in (5b) 'women' has a H to L pitch drop from /ba-/ onto the first syllable of the noun root /kazi/.

(5)

a.	Declarative:	à-bál-á á-bá-límí	's/he counts the farmers'
	Interrogative:	à-bàl-à à-bà-lìmì	'does s/he count the farmers?'
	Imperative:	bàl-à à-bà-lìmì	'count the farmers!'
b.	Declarative:	à-bál-á á-bá-kàzí	's/he counts the women'
	Interrogative:	à-bál-á á-bā́-kàzì	'does s/he count the women?'
	Imperative:	bàl-à à-bā́-kàzì	'count the women!'

(a- '3SG noun class 1 subject', -bal- 'count', -a 'final inflectional vowel', a- 'augment determiner', -ba- 'class 2 noun prefix, -limi 'farmer', -kàzi 'woman')

While the speaker typically raises the pitch register to produce the completely toneless interrogative utterance in (5a), the whole sequence trends down towards the final L%. In the interrogative in (5b), the phonological L that follows the H is realized on super-high pitch with subsequent TBUs progressively anticipating the level of the L%.[3] This widespread L% question marking across sub-Saharan Africa is surprising from a cross-linguistic perspective, since a H% or rising intonation in polar questions has been noted across language families (Bolinger 1978: 147) and at one time was thought to be a near-universal linguistic property (Ohala 1984: 2).

On the other hand, a large number of African languages show a right-edge L% in declarative sentences. Of the 12 African language prosodic systems described in Downing and Rialland (2017a), 10 display a L% in declaratives. The two exceptions are Basaa [Bantu; Cameroon] (Makasso et al. 2017) and Konni [Gur; Ghana) (Cahill 2017). See also the discussion above of Lusoga, which has a H% in declaratives.

Remarkably from a cross-linguistic perspective, not many African languages use prosody to mark focus constructions. While there are a number of distinct focus constructions found across African languages (Kalinowski 2015), intonation plays little to no role in focus marking. According to Kalinowski (2015: 159), 'It is evident from the collection of examples from these 135 languages that focus encoding in African languages is largely morphosyntactic in nature. While prosodic cues of stress and intonation may also be involved, they are not the primary means of encoding focus.' However, there are a few exceptions to the rule, where focused elements show a marked intonation contour: Hausa (Inkelas 1989b; Inkelas and Leben 1990), Chimwiini [Bantu; Somalia] (Kisseberth 2016), (p. 193) Akan (Kügler 2016), Shingazidja [Bantu; Comoros] (Patin 2016), and Bemba [Bantu; Zambia) (Kula and Hamann 2017).

In Hausa (Inkelas et al. 1986; Inkelas and Leben 1990), almost any word in an utterance can be emphasized (focused) by raising the first high tone in the emphasized word, which marks the beginning of an intonational domain. Phonological alternations that only apply within and not across intonational domains in Hausa (i.e. downdrift and raising of underlying low tones between two underlying high tones) do not apply between an emphasized word and the preceding word.

In languages with both complex tonal inventories and intonation, the two sometimes interact. In Embosi [Bantu; Congo-Brazzaville] (Rialland and Aborobongui 2017), intonational boundary tones are superimposed onto lexical tones, resulting in super-high and super-low edge tones. In (6), the final lexical L is produced with super-low pitch due to the utterance-final L%.

(6)

[wáβaaɲibeabóowéè̤] (Rialland and Aborobongui 2017: 202)

wa	áβaaɲi	bea	bá	(m)o-we
3SG.PRO	3SG.take.away.REC	CL8.property	CL8.GEN	CL1-deceased

'He took away the properties of the deceased.'

In Hausa, the final falling tone (HL%) in interrogatives neutralizes the difference between underlying H and underlying HL (Inkelas and Leben 1990). For example, word-final *kai*, 'you', with underlying H, and *kâi*, 'head', with underlying HL, are both produced with a HL fall as the final word in a question. In addition, downdrift is suspended both in questions and under emphasis in Hausa (Schachter 1965). In other languages with both tone and intonation, the two have very little effect on each other.

In a number of languages, coordination is often optionally marked with intonation alone. This is the case, for example, in Jamsay (Dogon: Heath 2008: 136–138), a two-tone language where coordinated NPs can simply be listed, the coordination being marked on every coordinated element only by what Heath terms 'dying quail' intonation, characterized by the 'exaggerated prolongation of the final segment (vowel or sonorant), accompanied by a protracted, slow drop in pitch lasting up to one second', e.g. /wó∴ kó∴/ → [wóōò kóōò] 'he/she and it'. A similar phenomenon is attested in Laal (Lionnet, personal notes), which has three tones (H, M, and L) and where two intonational patterns marking emphatic conjunction are attested. In both cases, the conjoined NPs are juxtaposed, and the coordination is marked only by a specific word-final pitch contour. In the first case, illustrated in (7a), the last syllable of every coordinated member is realized with rising pitch, irrespective of the value of the last lexical tone. The second strategy is preferred when the list is very long. Here, the word-final rhyme is significantly lengthened and the rising pitch is followed by a fall to mid pitch, as shown in (7b).

(7)

a.

bàár↗	náár↗	í	tú	pār → [bàā́r náā́r…]
his.father	his.mother	it.is	Bua	all

'Both his father and his mother are Bua [ethnic group].'

b.

í	sèré↗↘	í	cáŋ↗↘	káw	kíínà	pār → [í sèréē̤ē̤ í cáŋ̄ŋ̄…]
it.is	S.Kaba	it.is	Sara	also	do.it	all

'The Sara Kaba, the Sara, etc. everyone used to practise it too (slavery).'

(p. 194) 12.4.2 Length marking prosodic boundaries

Pitch is not the only phonetic parameter used to demarcate utterance and phrasal boundaries. A number of Bantu languages display lengthening of the penultimate vowel of a particular syntactic domain or sentence type. For instance, in Shekgalagari, which contrasts /H/ vs. Ø, the penultimate vowel is lengthened in declarative utterances, creating differences between medial versus final forms of nouns, as shown in (8) (Hyman and Monaka 2011: 271–272). While nouns with /Ø-H/ and /H-Ø/ patterns simply show vowel lengthening, penultimate lengthening affects the tone of the last two syllables of the other two patterns. When the last two syllables are toneless, the lengthened penultimate vowel contours from a L to super-low tone. When the last two syllables are /H/, the final H is lost and the penultimate H contours from H to L.

(8)

Underlying	*Medial*	*Final*	
/Ø-Ø/	nàmà	nȁːmà	'meat'
/Ø-H/	nàwá	nàːwá	'bean'
/H-Ø/	lórì	lóːrì	'lorry'
/H-H/	nárí	nâːrí	'buffalo'

Penultimate lengthening does not occur in interrogative or imperative sentence types, where the final tones are realized as in medial position: [à-bàl-à rì-nárí] 'is s/he counting buffalos?' (cf. [à-bàl-à rì-nâːrí] 's/he is counting buffalos'). See also Selkirk (2011) for clause-level penultimate lengthening in Xitsonga and Hyman (2013) for a survey of the status of penultimate lengthening in different Bantu languages.

12.5 Conclusion

The prosodic systems of sub-Saharan languages are quite varied. While tone is almost universal in the area, some languages have very dense tonal contrasts, some sparse; some languages make extensive grammatical use of tone, some less; and so forth. Word stress is less obvious in most languages of the area, with the question of whether stem-initial prominence should be equated with WA being unresolved. Finally, while less studied, the recent flurry of intonational studies is very encouraging.

Notes:

([1]) Note that in Map 12.1 tone heights are counted based on the number of contrastive pitch levels a language employs on the surface. Thus, if a language has a system consisting of L, H, and ˡH, it will be counted as having three tone heights.

([2]) Hausa shows an optional low boundary tone in polar questions (Newman and Newman 1981); however, there is also clear register raising in polar questions (Inkelas and Leben 1990), which rules it out of Clements and Rialland's list.

([3]) Concerning the imperative, it is also possible to say [bàl-à à-bá-kàzí] if the meaning is a suggestion, e.g. 'what should I do?', answer: 'count the women!'. It is never possible to show a final rise in a question.

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