

IV Prosodic systems : Niger-Congo and Adjacent Areas

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0. Introduction

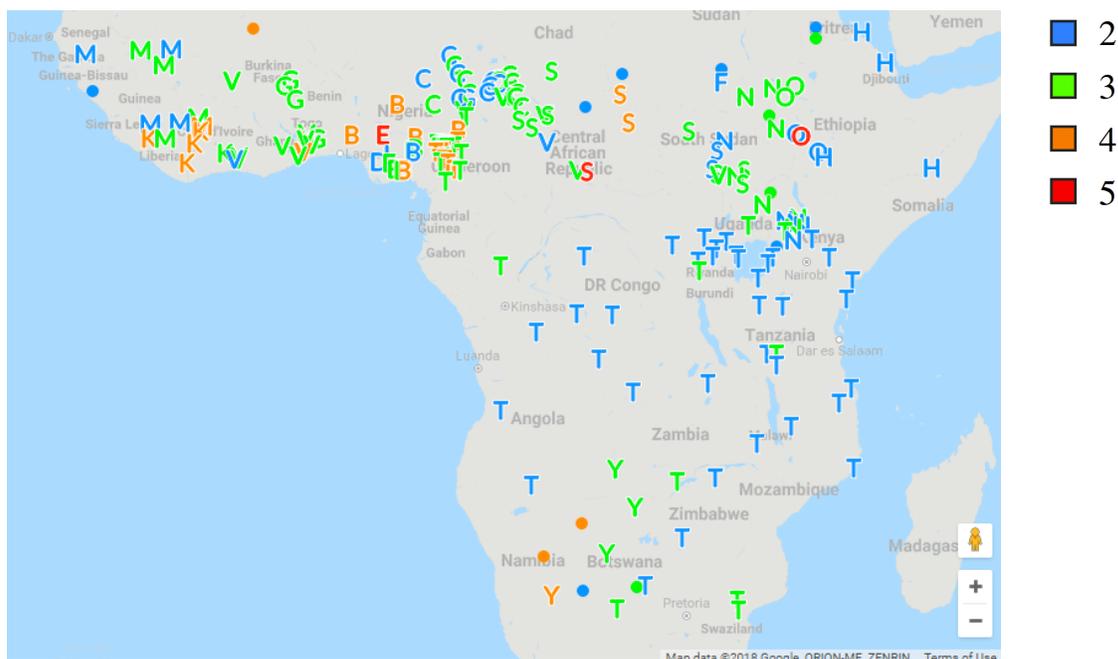
In this chapter we survey the most important properties and issues that arise in the prosodic systems of sub-Saharan Africa. While our emphasis will be on the vast Niger-Congo (NC) stock of approximately 1500 languages, much of what is found in NC is replicated in Greenberg's (1963) other major stocks: Nilo-Saharan, Khoisan, and the Chadic, Cushitic and Omotic subgroups of Afro-Asiatic. 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. In this chapter we will start with a discussion of tone (§1), followed by word accent (§2), and then intonation (§3).

1. 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 Niger-Congo and/or Nilo-Saharan (Wolff 1987:196-197). It is generally assumed that Proto-Niger-Congo, 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). 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 are generally assumed to have lost their tone via natural tone simplification processes (cf. Childs 1995) and/or influence from neighboring non-tonal languages (cf. Hombert 1984:154-5). 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, e.g. Sena [Mozambique], Tumbuka [Malawi] (Downing 2017:368), Nyakyusa [Tanzania], which are not likely to have lost their tones through external contact. Since tonogenesis usually if not always produces a binary contrast, languages with multiple tone heights have undergone subsequent tonal splits conditioned either by laryngeal features, e.g. the obstruent voicing of so-called “depressor consonants”, as in Kru (see Singler 1984:74 for Wobe) or by the tones themselves, e.g. raising of L to M(id) before a H tone which then subsequently drops out, as in Mbui [Grassfields Bantu; Cameroon] (Hyman & Schuh 1974:86).

1.1 Tonal inventories

Numerous sub-Saharan languages still show a binary contrast in their tones which may be analyzed 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 & 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 2009: 26). As pointed out by Clements & 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: *kār* 'clear', *kárí* 'inset or banana leaf', *kār* 'to circle', *kàr* 'wasp', *kàr* 'loincloth' (Rapold 2006: 120). Most of those spoken south of the Macro-Sudan Belt contrast two vowel heights (see Map 1).¹



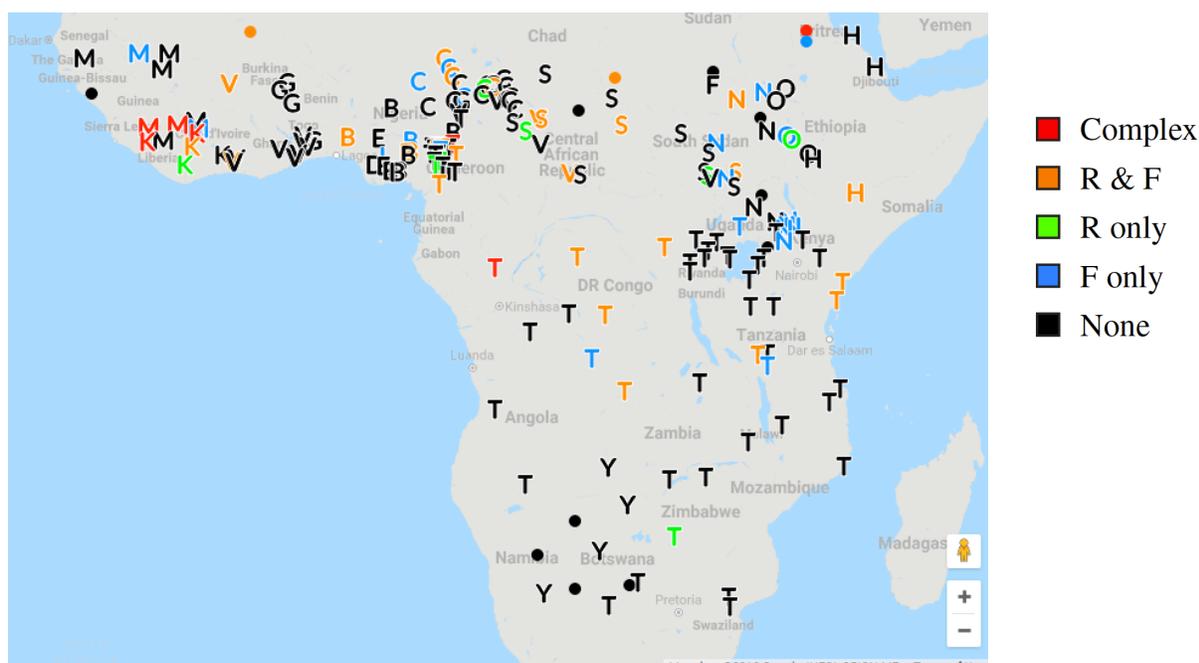
A = Atlantic, B = Benue-Congo, C = Chadic, D = Idjoid, E = Edoid, F = Kordofanian, G = Gur, H = Cushitic, I = Igboid, J = Kainji, K = Kru, M = Mande, N = Nilotic, O = Omotic, S = Central Sudanic, T = Bantoid, V = Volta-Congo, W = Kwa, X = Nubian, Y = Khoe-Kwadi, Z = Atlantic-Congo

MAP 1. Number of Contrastive Tone Heights

¹ Note that in Map 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 ^hH, it will be counted as having three tone heights.

Another area of high tonal density is to be found in the “Kalahari Basin area” (Güldemann 2010) in southwestern Africa, where languages formerly subsumed under the label “Khoisan” have up to four level tones: the Kx’a language ǀ’Amkoe (Gerlach 2016), and the Khoe-Kwadi languages Khwe (Kilian-Hatz 2008: 24-25), Gǀui (Nakagawa 2006: 32-60), and Ts’ixa (Fehn 2015: 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 1992, 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 analyzed as opposing two tone heights (H vs. L; Naumann 2016).

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



MAP 2. Types of Tonal Contours.

In terms of the number of contour tones, African languages have been reported with up to five falling tones, e.g. Yulu [Central Sudanic; Sudan] HM, HL, H¹L, ML, M¹L (Boyeldieu 1987: 140), and five rising tones, e.g. Wobe [Kru; Ivory Coast] 31, 32, 41, 42, 43, where 1 is the highest tone (Bearth & 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 three, as in Yoruba [Defoid; Nigeria] (Pulleyblank 1986: 192-193), others

The density of the tonal contrasts depends on whether a contrastive tone is required on every potential tone-bearing unit (TBU), or whether there are (some, many) toneless TBUs. In the most dense system the number of contrastive tone patterns will equal the number of contrastive tones multiplied against the number of TBUs. Thus, in a /H, L/ system there should be two patterns on a single TBU, four patterns on two TBUs etc. (and perhaps more patterns if tonal contours are allowed). A sparse tonal situation tends to arise in languages that have longer words, which in turn often have a more syntagmatic tone system. In these languages single tones, typically privative H, can be assigned to one or another position in a stem or word. In Chichewa [Bantu; Malawi], for example, a verb stem can be completely toneless or can have a H on its penultimate or final syllable. It is such systems that lend themselves to a privative /H/ vs. \emptyset analysis.

In another type of system often referred to as melodic, the number of TBUs is irrelevant. In Kukuya [Bantu; Republic of Congo], for instance, verb stems can have any of the shapes CV, CVV, CVCV, CVVCV, CVCVCV, i.e. up to three moras over which five different tonal melodies are mapped: H, L, LH, HL, LHL (Paulian 1975). Since a CV TBU can have any of the LH, HL or LHL contours, analyzed 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 in Cameroon.

1.3. 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 Niger-Congo languages is perseverative tone spreading which is most commonly triggered by H tone, then L, then M. In languages which have privative /H/ vs. \emptyset , only H can spread, as in much of Eastern and Southern Bantu, and similarly regarding L in /L/ vs. \emptyset systems such as Ruwund [Bantu; Democratic Republic of Congo] (Nash 1992). Such spreading can be either bounded, affecting one tone-bearing unit 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 /máýò mí rà wé/ → [máýò mǐ rà wě] ‘Mayomi bought books’ (Laniran & Clements 2003: 207). In other 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-bóh-él-an-a* ‘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 [Bantu; Tanzania] /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 [Bantu; Zambia, Namibia] /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: 315-6) 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 superhigh level, as in Engenni [Edoid; Nigeria] /únwónì/ → únwóńì ‘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.

1.4 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 & 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:

kán	H	‘demolish’	→	kàán	LH	‘be demolished’
kíkí ⁴ má	HH ⁴ H	‘hide’	→	kíkì ⁴ má	LLH	‘be hidden’

The second, *syntactic* type occurs at the phrase level. 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 [H⁴H] on two syllables:

námá	HH	‘animal’	→	ìnà námá	H ⁴ H	‘their animal’
bélè	HL	‘light’	→	ìnà bé ⁴ lé	H ⁴ 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: 132-3). 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 /bà/ assigns a [H] tone to the preceding verb which, when /L/ surfaces as [LH]: /sì/ ‘(be) bad’ → námá sǐ̀ bà ‘the animal will become bad’.

While all tonal languages in Africa exhibit GT, typically robustly, we know of no African language with only lexical tone. GT usage cuts across other typological dimensions such as tone inventory/system, degree of analyticity/syntheticity, and headedness parameter. It can express virtually all grammatical categories and many distinct types of grammatical relations, including derivation (valency, word class changes, a.o.), and all major inflectional categories such as number, case, tense, aspect,

mood, subject agreement, and polarity, as in Aboh Igboid: *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 (Green 2013, Creissels & Grégoire 1993), 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, a.o.).

Often in the verbal domain, tone only has a grammatical function with the verb root lacking a lexical tonal contrast. The table below illustrates this with closely related Bantu languages Luganda and Lulamogi [Uganda] (Hyman 2014). Both exhibit a lexical tonal contrast in the nominal domain, but only Luganda does so in the verbal domain.

	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, e.g. in Kisi [South Atlantic; Sierra Leone] (Childs 1995:55), Konni [Gur; Ghana] (Cahill 2000), Cishingini [Kainji; Nigeria] (N. Rolle & 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 [Uganda] *a-tolók-a* ‘s/he escapes’ vs. *á-tolok-é* ‘may s/he escape!’.

At least one language, Chimwiini [Bantu; Somali] has only grammatical tone and no lexical tone in any domain (Kisseberth & 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 & 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 & Abasheikh analyze 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 & Abasheikh 2011:1990-1992).

The interaction of grammatical tone with lexical tone and other grammatical tones is extremely rich and varied. One profitable way of illustrating complex grammatical tone interaction is through tonological paradigms showing which morphosyntactic features assign which tones. These assignments often conflict. It is profitable to view grammatical tone competition as ‘dominance effects’ (Kiparsky 1984, Inkelas 1998,

Kawahara 2015). As implemented in Rolle (in preparation), dominant GT wins systematically over other tone when under competition resulting in tonal replacement, as was exemplified in the first two types above from Kalabari. In contrast, non-dominant GT does not systematically win over other tones, often resulting in tones co-occurring together sponsored from two distinct morphemes, as in the third type in Kalabari. Dominant and non-dominant GT can be interleaved in morphologically complex words, resulting in ‘layers’ of GT. The following example comes from Hausa [Chadic; Nigeria] (Inkelas 1998:132). Dominant affixes *-í* AGENT and *-ìyáá* FEM replace any tones present 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.

- (a) [[[*má-* [*kàràntá* *-í*]] *-ìyáá*] *-r*]
 NML- read -AGENT-FEM -REF
 ‘the reader (f.)’
- (b) Dom *kàràntá* *-í* → *kàràncí*
 Non-dom *má-* *kàràncí* → *mákàràncí*
 Dom *mákàràncí* *-ìyáá* → *mákàràncìyáá*
 Non-dom *mákàràncìyáá* *-r* → *mákàràncìyâr*

It should be noted that GT interaction in some languages is especially complex and involves intricate rules of resolution not easily captured as dominant vs. non-dominant GT, e.g. 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 larger targets. Thus, /*bàbé*/ ‘uncle’ → *mí* *bábé* ‘my uncle’ vs. /*tìrè-àn-ná*/ ‘grandfather’ → *mí* *tìrè-àn-nà*.

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

2. Word-accent

While we have a great understanding of tone in African languages, there has been considerably less clarity concerning 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 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 accent 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 [Bantu; Democratic Republic of Congo], “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, e.g. initial (~ second syllable) in Wolof [Northern Atlantic; Senegal] (Ka 1988, Rialland & Robert 2001), penultimate (~ antepenultimate) in Swahili [Bantu; Tanzania, Kenya] (Vitale 1982). Other non-tonal languages appear not to have WA at all, and rather mark their prosody at the phrase level, e.g. by lengthening the vowel of the phrase-penultimate syllable and assigning a H tone to its first mora in Tumbuka [Bantu; Malawi] (Downing 2017:369-370). Kropp (1981) describes the stylistic highlighting (“stress”) of different syllables within the pause group in Ga [Kwa; Ghana].

While many tone languages are described without mention of stress or accent, we do find occasional attempts to predict accent from tone. In Kpelle [Mande; Liberia], 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 onto 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” (ibid, p.86). However, the fact that some words are accentless makes the analysis suspect, as obligatoriness is a definitional property of stress in non-tone language. Since the MHL and M melodies derive from /LHL/ and /LH/, respectively (Hyman 2003: 160), Welmers’ stress would have to be a very low-level phenomenon, assigned after the derivation of LH → M. We suspect that other claims of accent based on tonal distinctions are also due to the intrinsic properties of pitch realization and other factors that should not be identified with WA.

What is lacking in cases like Kpelle is a demonstration that the claimed accented syllable has consequences elsewhere in the phonological system. On the other hand, in a number of sub-Saharan African languages the stem- (or root-) initial syllable is an unambiguously “strong” position of prominence, licensing more consonant and vowel contrasts than pre- and post-radical positions where “weaker” surface realizations are also often observed. Perhaps the best-known case comes from Ibibio [Cross-River; Nigeria], whose consonant contrasts are distributed within the prosodic stem as follows (Urua 2000, Akinlabi & Urua 2002, Harris & Urua 2001, Harris 2004):

- | | |
|------------------------------|-----------------------------------|
| 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 r n γ ŋ |
| e. intervocalic VCCV: | pp mm tt nn yy kk ŋŋ |

As indicated, 13 consonants contrast stem-initially vs. six or seven in the other positions. The intervocalic weakening of stops to [β, ɾ, γ] only between the two stem syllables (not between a vowel prefix and stem, for instance), as well as the realization of /i, u/ as [i, ʌ] in stem-initial position, points to the formation of a prosodic stem with a strong-weak foot structure: /díp/ → *díp* ‘hide’, /díp-á/ → *díβé* ‘hide oneself’. 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 analyzable as /a/, which assimilates to the vowel of the first syllable (cf. *tòβó* ‘make an order’, *dééβ-é* ‘not scratch’, *kóŋ-ó* ‘be hung’).

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 overlapping with what Güldemann (2008) identifies as the “core” of the Macro-Sudan Belt. Most languages in this stem-initial prominence area are Niger-Congo. However, the signal seems to be areal, and not genetic: it is strongest in the center of the area (i.e. on both sides of the Nigeria-Cameroon border) and decreases toward the periphery. Most peripheral Niger-Congo languages have very little to no stem-initial prominence marked by distributional asymmetries (e.g. North-Central Atlantic, Bantu south of the Congo), and the presence of such asymmetries cuts across families, as is clear from its presence in Northwest Bantu, but not (or not as much) in the rest of Bantu. Finally, the only non-Niger-Congo languages with similar distributional asymmetries are mostly found at the periphery of the area, and are likely to have acquired stem-initial prominence through contact, e.g. Chadic languages spoken on the Jos Plateau next to Benue-Congo languages with stem-initial prominence (e.g. Goemai, with a long history of contact with Jukun, cf. Hellwig 2011: 6). Another example is the Chadic languages Ndam (Broß 1988) and Tumak (Caprile 1977) and the isolate Laal (Boyeldieu 1977, Lionnet, personal notes) 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, spoken far from the stem-initial prominence area, do not seem to have similar distributional asymmetries, even Saharan or Bongo-Bagirmi languages, spoken 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 Niger-Congo languages (cf. Table 1-a), but also neighboring unrelated languages through contact (cf. Table 1-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 must conform to very strict phonotactic templates: only $C(C)_1V_1C_2V_2$, $C(C)_1V_1V_2$, and $C(C)_1V_1N$ stems are attested. The stem may start with virtually any consonant in the (sometimes very large) inventory, notably any click consonant, 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 1-c).

a. Mande	:	Guro (Vydrin 2010), Mano (Khachaturyan 2015)
Gur	:	Konni (Cahill 2007), Koromfe (Rennison 1997)
Gbaya	:	Gbaya Kara Bodo (Moñino & 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 2010), Birom (Blench 2005, Hyman 2010)
Cross River	:	Ibibio (Urua 2000, Akinlabi & Urua 2002, Harris & Urua 2001, Harris 2004), Gokana (Hyman 2011)
NW Bantu	:	Kukuya (Paulian 1975, Hyman 1987), Tiene (Ellington 1977, Hyman 2010), 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)

Table 1: Stem-initial prominence marked by distributional asymmetries

The initial stem syllable may also affect how tone rules apply, e.g. attracting a H tone to them as in Giryama [Bantu; Kenya] (Volk 2011) or stopping the further spread of H, as in Lango [Nilotic; Uganda], where Noonan (1992:51) states that “Primary stress in Lango is invariably on the root syllable...”. Even though accent can be elusive in sub-Saharan African languages, since stem-initial stress is common cross-linguistically it is natural to identify such stem first syllable effects with the broader concept of WA. For further discussion see Hyman (2008: 324-334), Downing (2010: 408-409), Hyman et al (in press) and references cited therein.

3. Intonation

This section focuses on the prosodic features of intonation which mark sentence type or syntactic domain. We follow Ladd’s (2008) definition: “Intonation, as I will use the term, refers to the use of *suprasegmental* phonetic features to convey ‘postlexical’ 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 tempo and pitch range modulations due to excitement and other such factors.

A number of African languages distinguish sentence types with intonational pitch contours, often in addition to the lexical and grammatical tones and/or stress 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 [Bantoid; Nigeria, Cameroon] with four contrastive tone heights in addition to grammatical tone 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.

3.1 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). In a sample of over 100 African languages, Clements and Rialland found that more than half of the languages in their sample lack an utterance-final high or rising contour in polar questions. Rather, a number of languages show no intonational difference between declarative sentences and polar questions. Others make use of an utterance-final low boundary tone (L%) or falling intonation in polar questions. Specifically, this latter L% type of polar question marking is found in most Gur languages, as well as a number of Mande, Kru, Kwa, and Edoid languages, suggesting that it may be an areal feature of West Africa. Clements and Rialland (2008:77) found no Bantu, Afroasiatic, or Khoisan language that marks polar questions with a final L%,² though see Rialland & 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 (a) are underlyingly toneless, while in (b) ‘women’ has a H to L pitch drop:

² Hausa shows an optional low boundary tone in polar questions (Newman and Newman 1981); however, there is also clear register raising in in polar questions (Inkelas & Leben 1991), which rules it out of Rialland’s list.

- (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-kàzì ‘s/he counts the women’
 Interrogative: à-bál-á á-bá-kàzì ‘does s/he count the women?’
 Imperative: bàl-à à-bá-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’, -kàzì
 ‘woman’)

While the speaker typically raises the pitch register to produce the completely toneless interrogative utterance in (a), the whole sequence trends down towards the final L% boundary tone. In the interrogative in (b), the phonological L which follows the H is realized on a superhigh 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 twelve African language prosodic systems described in Downing and Rialland’s (2017) volume on tone and intonation in Africa, ten display a L% in declaratives. The two exceptions are Basaa [Bantu, Cameroon] (Makasso, Hamlaoui & Lee 2017) and Konni [Gur; Ghana] (Cahill 2017). See also Lusoga, above, 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 1989, Inkelas & Leben 1991), Akan [Ghana] (Kügler 2017), Bemba [Bantu, Zambia] (Kula and Hamann 2017), Chimwiini (Bantu, Somalia) (Kisseberth 2017), Shingazidja [Bantu, Comoros] (Patin 2017).

³ Concerning the imperative, it is also possible to say [bàl-à à-bá-kàzì] if the meaning is a suggestion, e.g. ‘what should I do?’, answer: ‘count the women!’. It is not possible to show a final rise in a question.

In Hausa (Inkelas et al. 1987, Inkelas & Leben 1991), almost any word in an utterance can be emphasized (focused). Emphasis is marked by raising the first high tone in the emphasized word, where the emphasized word begins a new intonational domain. Other properties sensitive to intonational domain in Hausa do not apply between an emphasized word and the preceding word (i.e. downdrift and raising of underlying low tones between two underlying high tones).

In languages with both complex tonal inventories and intonation, the two sometimes interact. In Embosi (Bantu, Congo-Brazzaville) (Rialland & Embanga Aborobongui 2017), intonational boundary tones are superimposed onto lexical tones, resulting in super-high and super-low edge tones. In the following example the final lexical low tone is produced with a super-low tone due to the effect of the utterance-final L%.

1. [wáβaapibeabóowéè] (Rialland & Embanga Aborobongui 2017:202)
wa áβaapɪ bea bá (m)o-we
3g.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 & Leben 1991). 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 Tswana [Bantu; Botswana] (Zerbian 2017) there is no interaction of lexical tones and intonation.

In a number of languages, coordination is often optionally marked with intonation alone. This is the case, for example, in Jamsay [Dogon; Mali] (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.:/ → [wóòò kóòò] ‘he/she and it’. A similar phenomenon is attested in Laal (Lionnet, personal notes), which has three tones (H vs. M vs. 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 (a) below, the last syllable of every coordinated member is realized with a rising pitch (including if it is H):

- (a) /bààr ↗ náár ↗ í tú p̄ar/ → [bàár náár...]
 his.father his.mother it.is Bua all
 ‘Both his father and his mother are Bua [ethnic group].’

In the second strategy, usually used to coordinate a few members of a list understood as being very long, the word-final rhyme is significantly lengthened, and realized with a rising pitch (including after a H tone) followed by a fall to a pitch close to a M tone. This is illustrated in (b).

- (b) /í sèré ↗ ↘ í cáŋ ↗ ↘ ków kínà p̄ar / → [í sèrééé í cáǰǰ̄...]
 it.is S.Kaba it.is Sara also do.it all
 ‘The Sara Kaba, the Sara, etc. everyone used to practice it too (slavery).’

3.2 Length marking prosodic boundaries

Another strategy for demarcating utterance and phrasal boundaries is to use prosodic features other than pitch. For example, a number of Bantu languages display lengthening of the penultimate vowel of a particular syntactic domain or sentence type. In Shekgalagari [Bantu; Botswana], which contrasts /H/ vs. Ø, the penultimate vowel is lengthened in declarative utterances, creating differences between medial versus final forms of nouns (Hyman and Monaka 2011: 271-272):

<i>underlying</i>	<i>medial</i>	<i>final</i>	
/Ø-Ø/	nàmà	nà:mà	‘meat’
/Ø-H/	nàwá	nà:wá	‘bean’
/H-Ø/	lórì	ló:rì	‘lorry’
/H-H/	nárí	nâ:rì	‘buffalo’

As seen above, 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 superlow tone. When the last two syllables are /H/, the final H is lost and the penultimate H contours from H to L. 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-nâ:rì* ‘s/he is counting buffalos’). See also Selkirk (2011) for clause-level penultimate lengthening in Xitsonga [Bantu; South Africa], and Hyman (2013) for a survey of the status of penultimate lengthening in different Bantu languages.

4. Conclusion

As seen in the preceding sections, 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 word accent being unresolved. Finally, while less studied, the recent flurry of intonational studies is very encouraging.

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