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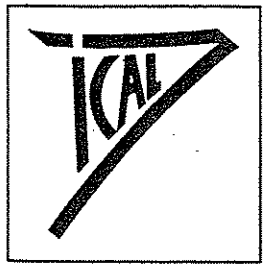

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Cecilia Odé & Wim Stokhof
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THE PROSODIC STRUCTURE OF KAMBERA ROOTS AND WORDS

Harry van der Hulst & Marian Klamer

1 Introduction

In this paper we examine the phonotactic structure of the Kambera lexicon. We make an attempt to go beyond simple description in trying to explain specific phonotactic patterns in terms of current theories of segmental and suprasegmental prosodic structure.

The organization of this paper is as follows. In section 2 we provide some extra-linguistic information. Section 3 deals with some basic facts of the phonology. Our proposals here anticipate some of our views on syllable structure which will be the subject of section 4.1, where we show that the phonotactic possibilities of roots in Kambera fall under a single prosodic characterization: all are instances of the so-called Uneven Trochaic Foot (UTF). The analysis that we present assumes that the UTF is a prosodic category, i.e. a prime of the theory. The theoretical importance of this proposal lies in the fact that Hayes (1986, 1995), as well as McCarthy & Prince (1986) have argued against the UTF and in favor of the Moraic Trochee (MT) as a primitive prosodic category. In section 4.1 we briefly examine the merits of an alternative analysis that refers to the MT. Next, in section 4.2 we analyze a number of phonotactic constraints regarding sequences of two vowels.

In contrast to section 4, which focuses on the structure of roots, section 5 addresses the phonotactic structure of affixes, clitics and a category of 'small words'. In section 6 we deal with the distribution of vowels and in section 7 we briefly look at a word game which provides support for our understanding of the syllabic structure of roots. Finally, section 8 summarizes some of our findings.

2 Extra-linguistic information

Kambera is a Central Malayo-Polynesian language (Blust 1993) and is part of the Sumba-Bima group of Austronesian languages. It is spoken by approx.

150,000 speakers[1] in the eastern region of the island Sumba (province Nusa Tenggara Timur, NTT) in Eastern Indonesia. Kambera is related to the languages spoken in the western part of Sumba, such as Weyewa and Kodi, and to the languages of Bima and Savu.

The oldest publication in which the language of Sumba is mentioned is Heijmering (1846), which contains a word list of a Sumbanese dialect (Mangili). Several word lists were published by Roos (1872), de Roo van Alderwerelt (1891), Vermast (1895), van der Velden (1900) and Pos (1901). Wielenga (1909) is a short grammar with texts and a word list. The work of the missionary/linguist Onvlee includes a grammar with Kambera texts (Onvlee 1925), an unpublished grammar about Kambera in lesson form and a Kambera-Dutch dictionary (Onvlee 1984).

Kapita published a Kambera-Indonesian dictionary (Kapita 1982) and a short grammar of Kambera in Indonesian (Kapita 1983). He also published several books with Kambera traditional ritual speech, songs, stories and sayings (Kapita 1977, 1979, 1987a, b). These four books, together with the Kambera New Testament and a Kambera Hymn book make up the entire Kambera written literature.

The data analyzed here come from fieldwork research by the second author. For a more detailed description we refer to Klamer (1994).

3 *Segmental inventory*

3.1 *Vowels*

At first sight Kambera seems to possess the following vowel system:[2]

(1)

i/i:		u/u:
e		o
	a/a:	

[1] Source: *Bahasa Daerah di Indonesia*, a publication of the Pusat Pembinaan dan Pengembangan Bahasa, Departemen Pendidikan dan Kebudayaan (Head Office for Language Promotion and Development, Department of Education and Culture) (n.d.) which is based on data from the *Language Atlas of the Pacific Area* (1983).

[2] The following graphic conventions are used: vowel length is indicated by <:>, primary stress by <'>, secondary stress by <'>, a syllable boundary by <.>, a morpheme boundary by <-> and clitic attachment by <=>. /ɛ/ and /ɔ/ represent the low variants of /e/ and /o/.

We will propose below that the appropriate representation of the 'length contrast' involves syllable quantity. We consider short vowels to be monopositional and long vowels to be bipositional. We will also argue that the long paradigm contains two diphthongs /au/ and /ai/ so that the vowel system can be represented as follows:

(2)

i		u	i:		u:
e		o	ai		au
	a			a:	

Kambera also has the vowel sounds [jɛ] (also [ɛ]) and [wɔ] (also [ɔ]). These low or broken vowels alternate with [e] and [o] when the following syllable contains a low vowel. We will analyze this process in section 4.2 and meanwhile refer to this as Umlaut; the following rule is just an informal statement of the process:

(3) e → ɛ, jɛ / — C a
o → ɔ, wɔ

We note here that the a/a: contrast may phonetically involve a [ɑ]/[a], i.e. a lax/tense distinction. A similar manifestation is detectable for the contrast in the high pairs, at least for the high front pair; /i/ is usually realized as [ɪ].

Adopting an element-based theory, we can represent the two series as follows (for ease of reference, it is also indicated which vowel is meant by the representation):

(4a)

X	X	X	X	X
front	round	low	low, front	low, round
/i/	/u/	/a/	/e/	/o/

(4b)

X X	X X	X X	X	X	X	X
front	round	low	low	front	low	round
/i:/	/u:/	/a:/	/ai/		/au/	

As shown in (4a), the short vowels /e/ and /o/ are considered to have a complex element structure; they are made up from a combination of two

elements.[3] This representation of /e/ and /o/ makes it clear why we view the diphthongs /ai/ and /au/ as their long counterparts.

The X's in (4) represent positions in the syllable. Long vowels, like diphthongs, occupy two syllable positions. We have represented long vowels with their second position empty. A motivation for this will be given in section 4.2.

3.2 Consonants

The Kambera consonant system is as follows:

(5)

	LAB	ALV	PAL	VEL	GLOT
VOICELESS PLAIN STOP	p	t		k	ʔ
VOICED IMPLOSIVE STOP	ɓ	ɗ			
VOICED AFFRICATE		dʒ			
NASAL	m	n		ŋ	
PRENASALIZED STOP	ᵐb	ⁿd		ᵑg	
PRENASALIZED AFFRICATE		ⁿdʒ			
VOICELESS FRICATIVE					h
VOICED LIQUID (ROLL)		r			
VOICED LIQUID (LATERAL)		l			
SEMIVOWEL	w	j			
PRENASALIZED SEMIVOWEL		ⁿj			

From a 'structural point of view' either the implosive or prenasalized stops take the place of 'plain voiced' stops. Loans with [b] or [d] show up with prenasalized stops in Kambera, as illustrated in (6). We therefore assume that the prenasalized stops form the voiced counterparts of the voiceless stops:

[3] We assume that the dependency relation which holds in case of element combinations is not specified phonologically, since there is no phonological contrast between two series of mid short vowels.

(6) Dutch *duit* > > > Kambera ***ndui*** 'money'
Indonesian *banding* > > > Kambera ***mbanding*** 'compare'

Because there is no contrast between vowel-initial and glottal stop-initial words, we assume that the glottal stop can be interpreted as the realization of an empty onset, as illustrated in (7):

(7) *ʔuʔu* 'agree' (say *u*: 'yes')
ʔuhu 'rice', 'food'
ʔuku 'limit'
**uku*

In section 4 we note that the consonants /l, r, h, t, k, ŋ/ are the only ones to occur in root-final position. From the viewpoint of their featural composition these consonants do not form an arbitrary subset. Except for this, we have not observed any other special distributional characteristics of consonants or processes affecting consonants.

4 Root structure

4.1 The root template

Roots in Kambera cannot be too small and neither can they be too big. The question as to how to properly characterize the size possibilities for roots is central to this section, and to the paper as a whole. We assume here that the prosodic organization of languages is formed by a hierarchy of prosodic categories which, at the lower levels, consists of the layers 'prosodic word', 'foot' and 'syllable'.

In our analysis Kambera allows CV and CVV syllables, both occurring with and without onset. (C)VV syllables can only occur under main stress — which is always on the first syllable of the root — where they contrast with (C)V. In positions without main stress (C)V syllables occur.

At first sight, Kambera appears to have closed syllables as well, since roots may end in a consonant (/l, r, h, t, k, ŋ/). However, we propose to analyze the root-final consonant as an extra C position which is added to the basic template. This is supported by the fact that a paragogic vowel /u/ appears after the root-final C. This vowel is 'weak' and may disappear in rapid speech.

There are no roots that consist of a single syllable containing a short vowel. This means that Kambera roots minimally consist of a syllable that has a branching rhyme or, put differently, two moras. Maximally, the root is a bisyllabic unit. The following roots exemplify the possibilities (for additional examples, cf. Klamer 1994):

(8) *Two V positions*

C V C V + C	V C V	C V V + C
n u l a ŋ	*à p a*	*d a a ŋ*
'pillow'	'grab/take X'	'be many'
w o r u k	*r i a*	
'be fertile'	'blood'	
n o m u	*l i i*	
'six'	'event'	

V V
i u
'shark'

Three V positions

C V V C V + C	V	V C V + C
w a i nd a l	*a*	*u l u ŋ*
'sway arm/throw X away'		'snatch X (away)'
p a i t a		
'bitter'		
h i i l i		
'again'		

C V V V + C	V V V + C
p a a u l	*a a i ŋ*
'flatter, convince X'	'to forgive X'

The pattern of /nomu/ and /da:u/ covers about 50% of the roots.

A noteworthy fact about roots with three V positions is that they are limited to those in which the first two positions form either a diphthong (ai, au) or a long vowel. Thus, sequences like the following are *not* found:

(9)

C V C V C V	V C V C V
k o b u l a	*u l a m i*
C V C V V	V C V V
k o b u a	*u l a i*

The vowel position taken by the paragogic [u] is not taken into account here. Hence, when we find forms like *nulangu* (i.e. CVCVCV), the final vowel is always the paragogic [u]. There are, then, no trisyllabic roots with a final vowel other than [u], like *kobula*.

Given that in roots with three vowels the first two vowel positions are always occupied by either long vowels or /ai/, /au/ in the first two vowel positions, we assume that a VV sequence consisting of /ai/, /au/ or two identical vowels forms a single syllable in the foot. By saying that the two V positions form a single syllable, we explain why we do not find words like *kiuha*; in this analysis a sequence like /iu/ cannot be analyzed as a complex syllable nucleus.

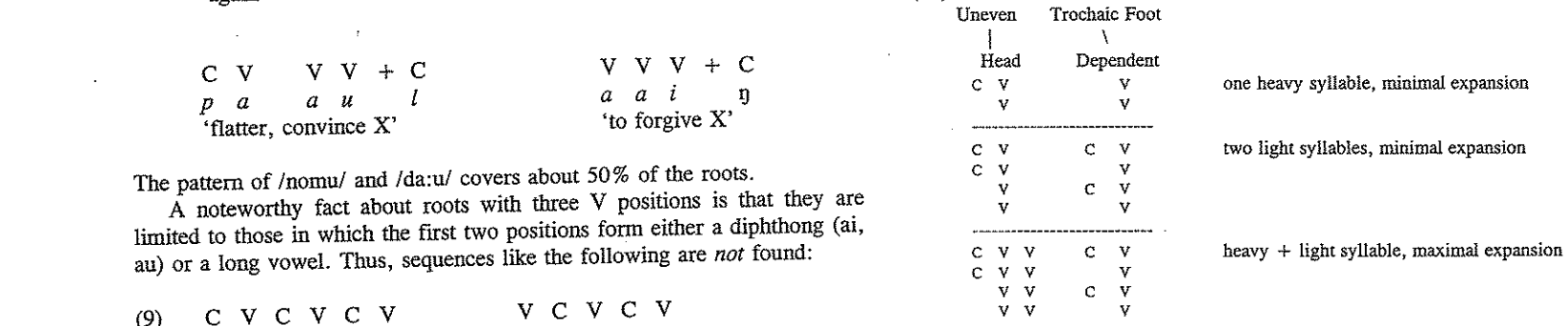
We can summarize the attested and unattested root patterns as follows:

(10) (C) V V = heavy syllable or H
(C) V = light syllable or L

Attested	*Unattested*
H (*li:*)	L (**li*)
L L (*no.mu*)	H H (**wai.tai*)
H L (*pai.ta*)	L H (**wa.tai*)
	L L L (**ko.bu.la*)

In order to exclude the LH type, we must say that the Kambera root has a maximal size. Its size is that of an Uneven Trochaic Foot, also known as the Quantity Sensitive Trochee, represented in (11):

(11)

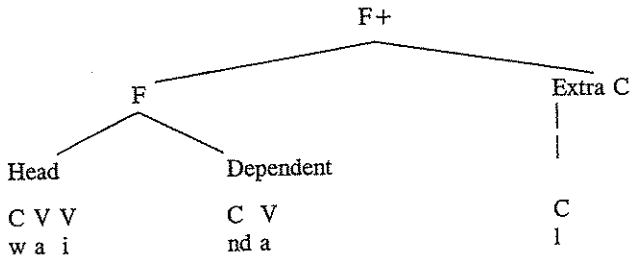


The UTF is minimally bimoraic and maximally bisyllabic. Furthermore, in case syllables of different weight are combined, the light syllable must be in

the second (unstressed) position. A single light syllable is universally ruled out as a potential foot.

The forms with an extra consonant will be analyzed as a Trochee Plus, i.e. a trochee plus an extra syllable, as in (12):

(12)



Our appeal to the UTF provides us with an elegant and, we think, insightful characterization of the structure of Kambera roots. This shows how relevant prosodic categories are to morphological matters — in this case, morpheme structure conditions. In addition, we would like to claim that our result must have consequences for current metrical theory. It has recently been argued that the UTF does not occur in the universal inventory of feet, instead, Hayes replaces this foot with the so-called Moraic Trochee (MT) (cf. Hayes 1986, 1995, McCarthy & Prince 1986, Kager 1994). Although we will not go into this area in any depth here, we will briefly examine the merits of an alternative analysis that refers to the MT. The Moraic Trochee allows the expansions in (13). Note the crucial absence of the HL-combination in this foot type.

(13) Moraic Trochee (= (m m))

H
L L

Suppose we attempt to characterize Kambera root structure in terms of the Moraic Trochee instead of the Uneven Trochee. To handle the HL sequences we would have to assume that we deal with a complex template consisting of a moraic trochee and an extra light syllable (and the PlusConsonant that we also recognized) as in (14).

(14) [(m m) (m)]

Under this view, we fail to explain the hard fact that a sequence of three light syllables (not involving the PlusConsonant) does not occur as a root. Instead, we predict all the expansions in (15), including the unattested one.

(15)	L L	(C)	=	min. expansion
	H	(C)	=	min. expansion
	H L	(C)	=	max. expansion
	L L L	(C)	=	max. expansion, AND UNATTESTED

We therefore suggest that the appropriate characterization of the root inventory appeals to the Unbalanced Trochee. For reasons of space we refer to van der Hulst & Klamer (1996) for a detailed account of the theoretical implications of our proposal.

Unbalanced feet are maximally trimoraic like ternary feet, but they differ from the latter in being maximally bisyllabic. We refer to van der Hulst (ms.) for a constraint-based account of a foot typology that allows for this type of foot next to binary and 'ordinary' ternary feet.

The foot type we have proposed allows for an ambiguity in the analysis of long vowels and diphthongs, which could either be analyzed in terms of the branching head node or as a bisyllabic sequence. In section 7 we will discuss a word game that allows us to decide in favor of the second option.

4.2 Vowel sequences in the Root

In this section we discuss two restrictions on VV sequences and one process applying to VV sequences ending in /i/ or /u/.

(16)

		V2		
		i	u	a
V1	i	+	+	+
	u	+	+	+
	a	+	+	+
	o	+	(+)	-
	e	+	+	-

As we have seen, a V_iV_j sequence is only tautosyllabic in case of /ai/ and /au/. Other VV sequences must therefore be heterosyllabic, i.e. involve hiatus. Given that this possibility exists (*iu* 'tongue', *ria* 'blood'), a sequence like /ai/ and /au/ is in fact ambiguous; we will return to this point below. Let us now consider a gap in heterosyllabic VV sequences. In the hiatus cases the combinations in (16) are allowed.

We interpret the absence of /ou/, which only occurs once in *dou Miri* 'Oh Lord', as an accidental gap, given the occurrence of the parallel /oi/. The non-occurrence of /ea/ and /oa/ can be explained as follows.

Recall the Umlaut rule in (2). We propose to view Umlaut as something we call 'low-attraction'. Due to the presence of the feature [low] in the final syllable, the [low] element of the preceding vowel is 'drawn' backwards. However, since there is an intervening consonant its exodus is arrested: it does not fuse with the following low vowel — and the result is a broken vowel [jɛ], optionally realized as [ɛ]:

(17)

V	C	V	→	V		C	V
|		|		/ |		|
front, low		low		front	low		low
/e/		/a/		/i/	/a/		/a/

Turning back to the absence of /ea/ and /oa/, let us assume that these bisyllabic sequences are subject to the same form of attraction, but this time there is no intervening consonant to stop the backward movement of the [low] element which then fuses with the [low] element of the final vowel:

(18)

V	V	→	V	V	
|	|		|	|	
front, low	low		front	low	
/e/	/a/		/i/	/a/	

Thus we have an explanation for the fact that /ea/ and /oa/ do not occur as (surface) vowel sequences.

The second restriction on VV sequences concerns certain unattested sequences, noted in Klamer (1989):

(19) **ri:ja* **tu:wa*
**ki:wa* **tu:ja*

Not only are the forms in (19) unattested, neither are there forms like the following:

(20) **ri:i* **tu:u*
**ki:u* **ra:a*
**tu:i*

It is tempting to explain the gaps of (19) and (20) by appealing to an OCP-constraint which applies to aperture. This constraint would state that a sequence of two identical aperture nodes is disallowed. However, cases like those in (21), in which we also find two identical aperture nodes in sequel *are* well-formed.

(21) *ri.u* (cf. *ha-riu* 'thousand')
ru.i (cf. *ha-rui* '(have) trouble')

OCP-violations can be circumvented by collapsing two identical specifications into one, as represented in (20). Then, the sequence of two identical nodes no longer exists.

(22)

X	X	
\	/	
aperture		

Thus, cases like /ri.u/ or /ru.i/ are fine: the aperture nodes of both high segments are conflated.

What is it then that prevents such a rescue for the bad forms in (19) and (20)? We now make crucial use of the way in which we have represented long vowels, i.e. with the second slot being empty. If a long vowel is followed by a segment of equal height this will violate the OCP-constraint, but in this case no 'repair' involving conflating is possible, because there is a general prohibition against discontinuous association:

(23)

V	V	X	↛	*V	V	X
|	|		\		/
H	H				H	

If the X position is a consonant it applies to the cases in (19), if it is a vowel it applies to (20). To close this section, we now turn to a process of gliding which affects sequences of vowels ending in /i/ or /u/:

(24)	i.u	[ha-riw]	'a thousand'
	u.i	[ha-ruj]	'(have) trouble'
	e.i	[kej]	'buy X'
	o.i	[pa-ndoj]	'make X'
	a.u	[ndaw]	'year'
	a.i	[aj]	'wood'

As mentioned earlier, [aw] and [aj] could also be underlying diphthongs. These diphthongal sounds, then, are phonologically ambiguous.

Gliding also applies in case the hiatus lies between the second and third vowel position:

(25)	a: . u	*pa:w*	'be moved (emotion)'
	a: . i	*ta:j*	'later'

If the second vowel is /a/ and the first vowel is /i/ or /u/, a homorganic glide is formed:

(26)	u.a	*du-wa*	'two'
	i.a	*ri-ja*	'blood'

Summarizing, in this section we discussed the phonotactics of the Kambera root template and characterized it as an Unbalanced Trochee. In addition, we gave an account of some phonotactic restrictions on vowel sequences in the root and discussed a process of gliding. In the next section we will give a brief overview of the non-root phonotactics.

5 *Non-root phonotactics*

5.1 *Affixes*

Kambera has only two suffixes, both consisting of one consonant: /k/ and /ŋ/. They may occur after roots that by themselves exhaust the maximal template, as shown in (27) (the /u/ is the paragogic vowel, which appears after a suffixal consonant).

(27) CVV CV Cu + Cu.

We assume that the two newly formed light syllables are parsed into a separate foot, as in (28), and that the thus created foot is part of the prosodic word (PrW).

(28) [(x . .) (x .)]PrW
CVV CV Cu + Cu

All Kambera prefixes have the form CV. At most two prefixes are found to occur in sequence. The vowel occupying the V position is always /a/. In prefixes, then, we find effectively *no* vocalic contrast. We will argue below

that prefixes can thus be analyzed as having a V position which is spelled out as /a/.

5.2 *Clitics*

Kambera has enclitics marking aspect and mood (cf. 30), proclitics marking subordinate clauses (cf. 29), and pronominal pro- and enclitics (cf. 32). We separate the discussion of pronominal clitics from other clitics.

(29) Proclitics: marking coordinate and subordinate clauses, locatives, articles: Ca, Ci, Cu

hi, ka, ba	CONJUNCTION
pa	marks relative clause with obj/location gap
ma	marks relative clause with subj/possessor gap
pa	marks controlled clause
hu	LOCATIVE (directional)
la	LOCATIVE
na	ARTICLE (sg.)
da	ARTICLE (pl.)
i	ARTICLE (proper)
nda	NEGATION

(30) Enclitics marking mood and aspect: Ca, Cu, a, i

ma	EMPHASIS	*mbu*	also
pa	IMPERFECTIVE	*du*	EMPHASIS
ka	PERFECTIVE	*i*	again, also (ASP)
wa	HORTATIVE	*a*	just, only

A special case in (30) is [ɗu], which usually contains a tense or long vowel, i.e. is pronounced as [ɗu:]. Yet it is represented in (30) as /du/ because its length (tenseness) disappears if a following CV clitic is added, as the contrasting sentences in (31) show:

(31a)	*Nda*	*na=mai*	*=ma*	*='du*	*na*	*sopir*
	NEG	3SG=come	=MOD	=EMP	ART	driver
	'The driver did not come'					

(31a') ['nda na'mài ma'ɗu: na so'piru]

(31b) *Hama* **=*du*** *=na* *na* *mbuku* *=nggu* *nyungga*
same =EMP =3SG ART book =1SG I
'My book is (really) similar'

(31b') ['hama 'ɗuna na 'mbukuŋgu 'njuŋga]

That is, [ɗu:] is shortened in [ɗu=na] in (31b') because the combination of the two clitics is parsed into a trochaic foot pattern. We propose that the post-lexical foot is a simple bimoraic trochee. Perhaps we can say that the clitic group is thus prosodified, although we leave open how the prosodic structure of clitic groups can be characterized in general.

There are bisyllabic markers for mood: *bia* 'just, rather' and *àru* HORTATIVE (polite). They may be considered 'small words' rather than enclitics. Although they have stress, they are classified as clitics because of their distributional and semantic properties.

The pronominal pro- and enclitics are rather like the aspectual and modal enclitics in having simple phonotactic properties and no stress. They only contain the vowels /a,i,u/ and most of them have the shape.CV.

(32)	NOM	ACC	DAT	GEN
1s	*ku-*	*-ka*	*-ngga*	*-nggu*
2s	*(m)u-*	*-kau*	*-nggau*	*-mu*
3s	*na-*	*-ya*	*-nya*	*-na*
1p(inc)	*ta-*	*-ta*	*-nda*	*-nda*
1p(exc)	*ma-*	*-kama*	*-nggama*	*-ma*
2p	*(m)i-*	*-ka(m)i*	*-ngga(m)i*	*-mi*
3p	*da-*	*-ha*	*-nja*	*-da*

The pronominal clitics *=kama/=nggama* 'we (inclusive) Acc/Dat' are bisyllabic, but do not have stress. The clitics *=ka(m)i/=ngga(m)i* 'you (plural) Acc/Dat' have a bisyllabic and a monosyllabic variant. Usually, the shorter form is used (*=kai/=nggai*).

5.3 'Small words'

'Small words' have the shape CV when occurring with a clitic and the shape CV: when occurring alone, where V contains /i/, /u/, /a/. Examples are given in (33):

(33) *nggi* WHERE
ngga WHAT
ni DEICTIC (at speaker)
nu DEICTIC (far from speaker & addressee)
na DEICTIC (at addressee)

The alternation between long and short vowel is illustrated in (34) below. In (34a) a demonstrative pronoun is formed through the combination of a deictic element and the third person singular pronominal enclitic *-na*. In (34b) the vowel in the same deictic element is lengthened in a Prepositional Phrase. The fact that a Kambera root should minimally be a bimoraic foot explains why these items have a long vowel when they occur on their own.

(34)	*nu*	far from speaker/addressee
(a)	['**nu**na]	'that one'
(b)	[laj '**nu:**]	'(be) over there'

6 Vowel distribution

The data discussed in the previous two sections show that Kambera has the following distributional patterns for vowels in the Prosodic Word:

(35) (a) pretonic: *default* (= /a/)
(b) tonic: all vowels
(c) posttonic1: /i/, /a/, /u/
(d) posttonic2: *default* (= /u/)

Evidence for saying that prefixes belong to the prosodic word will be discussed in section 7 below.

We have seen that clitics and 'small words' are essentially Ci, Ca, Cu, although there are some exceptions. If we do not take clitics and 'small words' into account when we generalize the pattern of Kambera vowel distribution, the Kambera prosodic word shows the following possibilities (in its maximal extension):

(36)

C	V	-	C	V	-	[	C	V	(V)	C	V	]$_{root}$	-	C	V	-	C	V
	a			a			i			i					u		u	
							u			u								
							e			a								
							o											
							a											

The presence of a second vowel in the (optional) head position creates a long vowel. Recall that the long counterparts of the vowels /e/ and /o/ are the diphthongs /ai/ and /au/.

'Small words' and clitics have the same structure as the weak (i.e. unstressed) root syllable. Since 'small words' and clitics are syntactic words that lack prosodic word status we may say that all weak non-affix syllables contain one of the three vowels /i/, /u/ or /a/. This generalization covers 'small words', clitics and the weak syllable of roots.

All bound morphemes *lack* vowel contrast. On the assumption that the suffixes /k/ and /ŋ/ have the syllabic shape CV (V being filled by the paragogic /u/), we can say that the empty V position in affixes is spelled out as /a/ in pretonic position (i.e. in prefixes) and as /u/ in posttonic position (i.e. in suffixes).

Summarizing, in section 4 we saw that the Kambera content words (lexical roots) should minimally be bimoraic and maximally bisyllabic, while in this section we have seen that affixes and clitics do not meet the former requirement. Instead, they can be monomoraic, and in fact, they typically are. Dresher & van der Hulst (1995) relate these facts to a recurrent asymmetry between heads and dependents in prosodic structure, to the effect that heads tend to be more complex than dependents. In the case at hand, heads at the phrasal level are required to be bimoraic and since such heads will typically be major category words, this constraint on prosodic structure has been 'lexicalized' in the form of a constraint on the form of major category morphemes. Non-major categories will typically be non-heads, and thus need not be bimoraic. They share this characteristic with clitics — units that, while belonging to a major category, fail to meet the prosodic requirements that 'heads' call for.

7 A word game

Kambera speakers perform the following word game as a secret language.

(37)

'iu	'shark'	→	*ʔuwi*
'yu:	'tongue'	→	*'wuyu*
'ri:	'vegetables'	→	*'yiri*
'ndui	'money'	→	*'indu*
'haila	'saddle'	→	*la'hai*
'tu:ki	'be round/spherical'	→	*ki'tu:*
'aulung(u)	'snatch away'	→	*'lungu'au*
ka-'lauki	'k.o. chicken'	→	*kika-'lau*
ka-'nga:u	'miaow'	→	*uka-'nga:*
ma-'lai	'be long'	→	*yima-'la: ʔima'la:*
pa-'ndoi	'make X'	→	*ipa-'ndo:*

ka-paindah(u)	'reflect', 'bounce'	→	*huka-'painda*
		→	*'ndahu ka-'pai*
pa-ka-maitar(u)-ng(u)	'grouch, sulk'	→	*'tarung(u) pa-ka-'mai*
wihi menja	'leg of table'	→	*hiwi njami*

As we know, the head of the foot is the syllable bearing primary stress. The generalization that captures all alternations in (37) is that the portion following the head of the foot is placed at the beginning of the prosodic word, assuming that the affixes are contained in the prosodic word domain. For instance, the heads of *tu:ki* and *ka-lauki* are the syllables *tu:* and *lau*. In the game the non-head is prefixed to the prosodic word, which results in *kitu:* and *kika-lau*.

Finally, the following facts support the view, mentioned in section 4.1, that a VV sequence is parsed as the head of the foot IFF *another* syllable follows. In case the foot consists of just a VV, the second V position is regarded as the non-head:

(38)

haila	→	*la.hai*	and not	*(y)i.la.ha*
tu:ki	→	*ki.tu:*	and not	*(w)u.ki.tu*

but:

yu:	→	*wu.yu*	
ri:	→	*yi.ri*	

8 Summary and conclusions

The present paper offers an analysis of most aspects of the phonotactic structure of morphemes in Kambera. We have specifically drawn attention to the fact that Kambera roots can neither be too small nor too big. All roots were characterized prosodically as an Unbalanced Trochaic Foot to which an extra C(V) unit can be added.

We also observed that affixes, clitics and 'small words' in Kambera do not meet the minimal size of an UTF and related these facts to a recurrent asymmetry between heads and dependents in prosodic structure in general.

With reference to vowels, we noticed that distributional restrictions between vowels can be directly related to their positions in the prosodic structure, such that 'stronger' positions in prosodic structure allow for more contrasting vowels.

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