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Construction Tonology: The Case of Kalabari

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ABSTRACT

Although it is common for “replacive” tonal patterns to be assigned by word-level morphological constructions, it is far less common for such overriding schemas to be assigned by specific phrase-level syntactic constructions. Kalabari, an Ijoid language of Nigeria, does exactly this: Whenever the noun is preceded by a modifier, it loses its tones and receives different “melodies” depending on the constructional word class of the preceding specifier/modifier, either /HL/, /HLH/, /LH/ or /L/. In this paper we first document the assignment of these different syntactic melodies and then provide evidence for how they developed diachronically.

1. Introduction

The purpose of this talk is to present an analysis of an unusual situation whereby phrasal tones are assigned by construction in Kalabari [káláɓari], an Ijoid language spoken in Nigeria (Harry 2004). We will first present the facts and then speculate on how this situation may have arisen diachronically. To begin, we note that it is common for tone to be assigned by WORD-LEVEL morphological constructions. For example, when Kalabari verbs are detransitivized, a /LH/ melody is assigned:²

(1)	<i>transitive</i>			<i>intransitive</i>		
a.	kán	H	‘tear, conquer, demolish’	kàán	LH	‘tear, be conquered, demolished’
	kɔn	L	‘judge’	kòón	LH	‘be judged’
b.	ányá	H-H	‘spread’	ànyá	L-H	‘be spread’
	díma	L-L	‘change’	dímá	L-H	‘change’
	sá [↓] kí	H- [↓] H	‘begin’	sàkí	L-H	‘begin’
c.	kíkíma	H-H-L	‘hide, cover’	kikimá	L-L-H	‘be hidden, covered’
	pákírí	H-L-H	‘answer’	pàkírí	L-L-H	‘be answered’
	gbóló [↓] má	H-H- [↓] H	‘join, mix up’	gbòlomá	L-L-H	‘be joined, mixed up’

As the above examples illustrate, transitive verbs contrast a number of tone patterns which neutralize to monosyllabic LH, bisyllabic L-H or trisyllabic L-L-H, when detransitivized. The above is a classic case of what Welmers (1973:132-3) termed “replacive tone”: A morphological process assigns a tone pattern which overrides the input lexical tones of the base. One can also

¹ Our thanks to Sharon Inkelas for suggesting the connection to construction morphology (Booij 2010). Our thanks also to the participants at past presentations for their comments, suggestions and encouragement. For further information on the grammar of Kalabari see especially Jenewari (1977).

² In these and other examples an acute (´) accent marks H(igh) tone, while either a grave (`) accent or no mark indicates L(ow) tone. The downward arrow (↓) indicates a downstepped H tone.

view the /LH/ intransitive melody as templatic, i.e. not unlike inflectional or derivational features assigning different CV structures, as in Arabic (McCarthy 1981).

Far less common, however, is for such overriding schemas to be assigned by specific phrase-level syntactic constructions. Kalabari does exactly this: Within the noun phrase, the noun appears finally, followed only by a possible definite article. Whenever the noun is non-initial, it loses its tones and receives one of four different “melodies” depending on the constructional word class of the preceding specifier/modifier. Thus compare the different realizations of the underlying all H tone pattern of /bùrú má/ ‘indigo’.³

(2)	<i>construction</i>	<i>phrasal tones</i>	<i>example</i>	
a.	N + N	HL	tubɔ bʉrú má	‘the child’s indigo’
b.	PossPro + N	HLH (→ H- ^l H)	ina bʉrú ^l má	‘their indigo’
c.	Interrogative + N	LH	tɔ bʉrú má	‘which indigo?’
d.	Quantifier + N	L	ja bʉrú má	‘some indigo’

As seen in (2a), a nominal possessor assigns a /HL/ melody to the possessed noun, while a pronominal possessor assigns a /HLH/ melody, realized as H-^lH on the last two syllables in (2b). In (2c) a /LH/ melody is assigned by the interrogative *tɔ* ‘which’ (also by demonstratives), while (2d) shows that a /L/ melody will be assigned by quantifiers (including numerals). The following shows that the five tonal patterns found on bisyllabic nouns neutralize and receive the indicated construction-specific tones (where ‘garri’ is a West African food made with cassava):

(3)					<i>‘the child’s’ (HL)</i>	<i>‘their’ (HLH)</i>	<i>‘which’ (LH)</i>	<i>‘some’ (L)</i>
a.	námá	‘meat’	H-H	→	tubɔ námá	ina ná ^l má	tɔ námá	ja nà má
b.	pulo	‘oil’	L-L	→	tubɔ pùlò	ina pú ^l ló	tɔ pùlò	ja pùlò
c.	béle	‘light’	H-L	→	tubɔ bélé	ina bé ^l lé	tɔ bélé	ja bèle
d.	gàrí	‘garri’	L-H	→	tubɔ gá rí	ina gá ^l rí	tɔ gá rí	ja gá rí
e.	bá ^l rá	‘hand’	H- ^l H	→	tubɔ bá ^l rá	ina bá ^l rá	tɔ bá ^l rá	ja bá ^l rá

Such data raise two types of questions. First, how should the constructional tones be analyzed synchronically? That is, how are they assigned, and how do they potentially interact with each other? Second, why does Kalabari have constructional tones? That is, what is their relationship to what is found in other languages, and where do they come from diachronically? In the following sections we will first document the different constructional tones in further detail (§2), then consider how the different melodies interact (§3). This will be followed by discussion (§4) and a conclusion (§5) in which we propose a diachronic analysis which accounts for how the system arose.

2. The tonal melodies

As mentioned, there are four tonal melodies in all: /HL/, /HLH/, /LH/ and /L/. As we will see, these are assigned by well-defined constructions (see also Harry 2004). In this section we will

³ We shall adopt the following practice in transcribing L tones: (i) those Ls which come from one of the assigned melodies are marked with a grave accent; (ii) those Ls which are from the lexical representations or are assigned by default are unmarked. We shall generally mark the L of an assigned melody only once. Thus in (2c,d), *bʉrú má* indicates a L-L-H realization of the /LH/ melody and *bʉrú má* a L-L-L realization of the /L/ melody.

illustrate in turn how each of these affects a simple noun head. In §3 we will look at cases involving more complex noun phrase structures.

2.1. /HL/ melody: N₁ + N₂

In Kalabari, nominal possession consists in simple juxtaposition of the possessor before the possessed. The resulting construction, which we indicate as N₁ + N₂, is non-distinct from noun compounding. As was seen in (3), the possessor noun (N₁) keeps its lexical tones, while the second, possessed noun (N₂) receives a /HL/ melody. The examples in (5) show that the same tone melody assignment applies independent of the tonal shape of N₁:

- (5) a. féní ‘bird’ H-H → féní námà ‘the bird’s meat’ (cf. námá ‘meat’)
 b. tubò ‘child’ L-L → tubò námà ‘the child’s meat’
 c. sírɪ ‘leopard’ H-L → sírɪ námà ‘the leopard’s meat’
 d. ekpé ‘he-goat’ L-H → ekpé námà ‘the he-goat’s meat’
 e. é[↓]bé ‘insect (sp.)’ H-[↓]H → é[↓]bé námà ‘the insect’s meat’

The trisyllabic N₂ nouns in (6) show that the /HL/ links to last two syllables, suggesting for the moment that the melody targets the right edge of the noun:

- (6) a. lubulu ‘sheath’ L-L-L → tubò lubùlù ‘the child’s sheath’
 búrú má ‘indigo’ H-H-H → tubò búrú má ‘the child’s indigo’
 kúkálí ‘fruit’ H-L-H → tubò kúkálì ‘the child’s fruit’
 b. lubulu ‘sheath’ L-L-L → féní lubùlù ‘the bird’s sheath’
 búrú má ‘indigo’ H-H-H → féní búrú má ‘the bird’s oil’
 kúkálí ‘fruit’ H-L-H → féní kúkálì ‘the bird’s light’

As seen, the underlined first syllable of the N₂ nouns in (6a) is realized L when the N₁ noun ends L. We assume that these syllables are phonologically toneless and receive a default L in the ultimate output. In (6b) the first syllable of N₂ is realized H when the N₁ ends H. In this case we assume that the H of /féní/ ‘bird’ has spread onto these syllables. Such H tone spreading is quite frequent and will be seen in many of the examples to follow. It however never affects more than one syllable.

Since nominal possession is recursive, the question naturally arises as to what happens when in a N₁ + N₂ + N₃ construction, as in the representative forms in (7).

- (7) a. tubò + féní + námá → tubò féní námà ‘the child’s bird’s meat’
 L-L H-H H-H H L
 b. féní + mínjí + kúkú → féní mínjí kúku ‘the bird’s water pot’
 H-H L-L H-H H H L

As seen, the H of the /HL/ melody goes on the last syllable N₂, while the L goes on the first syllable of N₃. Unmarked syllables receive their tone as seen in earlier examples: The tone of the first syllable of N₂ is L in (7a) vs. H in (7b), the latter undergoing H tone spreading from féní. The unmarked final syllable of each N₃ receives L by default. The generalization which we will eventually draw is that a melodic H targets the closet word-final syllable, while a melodic L targets the closes word-initial syllable. This yields the assignments shown on N₂ and N₃ in (7).

2.2. /HLH/ melody: PossPro + N

As was seen in (3), possessive pronouns assign a /HLH/ to the following noun. In the first two output columns in (8) we see that /HLH/ will map as H-[↓]H on a bisyllabic noun, whether the possessor ends H or L.

(8)										
	a.	námá	‘meat’	H-H	→	í ná [↓] má	ina ná [↓] má	i namá [↓] á		
	b.	pulo	‘oil’	L-L	→	í pú [↓] ló	ina pú [↓] ló	i puló [↓] ó		
	c.	béle	‘light’	H-L	→	í bé [↓] lé	ina bé [↓] lé	i belé [↓] é		
	d.	garí	‘garri’	L-H	→	í gá [↓] rí	ma gá [↓] rí	i garí [↓] í		
	e.	ḃá [↓] rá	‘hand’	H- [↓] H	→	í ḃá [↓] rá	ma ḃá [↓] rá	i ḃará [↓] á		

The ‘my’ forms in the third output column show a curiosity of the possessive construction: If the pronoun consists of a L tone vowel, rather than deriving H-[↓]H, the HLH links to the final syllable, which then undergoes lengthening. This thus yields *i namá[↓]á* instead of **i ná[↓]má*, etc.⁴ The output forms of /námá/ ‘meat’ in (8) show both these two realizations, but more importantly that all possessive pronouns assign the same /HLH/ melody to the following noun:

(9)	i namá [↓] á	‘my meat’	wána ná [↓] má	‘our meat’
	í ná [↓] má	‘your meat’	ina ná [↓] má	‘their meat’
	o namá [↓] á	‘his meat’		
	á ná [↓] má	‘her meat’		
	ani ná [↓] má	‘its meat’		

In general, the /HLH/ melody otherwise has mapping properties similar to /HL/. Thus we see that /HLH/ is right aligned on trisyllabic nouns as seen in (10), the first syllable taking the same tone as the end tone of the preceding element:

(10)									
	a.	lubulu	‘sheath’	L-L-L	→	í lúbú [↓] lú	ina lubú [↓] lú	i lubú [↓] lú	
	b.	ḃúrúmá	‘indigo’	H-H-H	→	í ḃúrú [↓] má	ina ḃurú [↓] má	i ḃurú [↓] má	
	c.	kókálí	‘fruit’	H-L-H	→	í kóká [↓] lí	ina kóká [↓] lí	i kóká [↓] lí	

Also as in the case of /HL/, the tones of the /HLH/ melody separate over a N₁ + N₂ sequence. As seen in (11), the first H goes on the last syllable of the N₁, the L on the first syllable of N₂, and the second H on the last syllable of the N₂:

⁴ We have no explanation for this other than to note that it is as if the L tone V pronoun forms a prosodic constituent with the first syllable, i.e. *i + námá* → (i na) (ma), with the /HLH/ melody then being right-aligned with (ma). It must be added that for the sake of simplicity we have avoided addressing certain phonological properties of the language which may affect other forms. For example, when the /HL/ or /HLH/ melodies are assigned to a monosyllabic noun, the vowel lengthens: /sò/ ‘sky, heaven’ → *tubò sóò* ‘child’s destiny’. There are also potential complications when vowels meet across a word boundary. Thus, /aku/ ‘bee’ + /ásu/ ‘odor’ → *aku asúù* ~ *aku asú* ‘bee odor’. The expected form *aku ásù* with HL assigned to the N₂ can be heard only in very careful, perhaps unnatural speech. None of these “complications” affects the basic issues being discuss here, namely the assignment of tone melodies by construction.

- (11) a. i + $f\acute{e}n\acute{i}$ + $n\acute{a}m\acute{a}$ → i $f\acute{e}n\acute{i}$ $n\grave{a}m\acute{a}$ ‘my bird’s meat’
 L H-H H-H L H L H
 b. \acute{i} + $m\acute{i}n\acute{j}i$ + $k\acute{u}k\acute{u}$ → \acute{i} $m\acute{i}n\acute{j}i$ $k\acute{u}k\acute{u}$ ‘your sg. water pot’
 H L-L H-H H H L H

The same mapping is seen even more clearly when there is an N₃:

- (12) a. i + $f\acute{e}n\acute{i}$ + $m\acute{i}n\acute{j}i$ + $k\acute{u}k\acute{u}$ → i $f\acute{e}n\acute{i}$ $m\grave{i}n\acute{j}i$ $k\acute{u}k\acute{u}$ ‘my bird’s water pot’
 L H-H L-L H-H L H L H
 b. \acute{i} + $t\acute{u}b\acute{o}$ + $s\acute{i}r\acute{i}$ + $n\acute{a}m\acute{a}$ → \acute{i} $t\acute{u}b\acute{o}$ $s\grave{i}r\acute{i}$ $n\acute{a}m\acute{a}$ ‘your child’s leopard
 H L-L H-L H-H H H L H meat’

These forms make even more clear that the tones have a preference for mapping by word: The first H goes on the last syllable of N₁, the L goes on the first syllable of N₂, and the second H goes on the last syllable of N₃. Otherwise, it would have been possible for the second H to map onto the last syllable of N₂, incorrectly yielding **i feni minji kuku*, which presumably would have undergone H tone spreading to become **i feni minji kuku*, with the last syllable receiving a default L. That the melodic tones distribute themselves by word is further evidence that we are dealing with a constructional phenomenon, not a purely phonological one (see further below).

2.3. /LH/ melody: Determiner + N

Although illustrated with the interrogative *tɔ* ‘which’ in (3), all pronominal determiners, e.g. demonstratives, which distinguish gender in the singular, assign a LH melody to the following noun:⁵

- (13) $\acute{b}i$ $n\acute{a}m\acute{a}$ ‘this animal’ (m.) $m\acute{a}$ $n\acute{a}m\acute{a}$ ‘these animals’
 $m\acute{a}$ $n\acute{a}m\acute{a}$ ‘this animal’ (f.) $m\acute{i}$ $n\acute{a}n\acute{a}m\acute{a}$ ‘these animals’
 $m\acute{i}$ $n\acute{a}m\acute{a}$ ‘this animal’ (n.)

The following shows that all bisyllabic nouns neutralize as L-H after demonstratives:

- (14) a. $n\acute{a}m\acute{a}$ ‘meat’ H-H → $m\acute{i}$ $n\acute{a}m\acute{a}$ ‘this animal’ $m\acute{i}$ $n\acute{a}$ $n\acute{a}m\acute{a}$ ‘these animals’
 b. $p\acute{u}l\acute{o}$ ‘oil’ L-L → $m\acute{i}$ $p\acute{u}l\acute{o}$ ‘this oil’ $m\acute{i}$ $n\acute{a}$ $p\acute{u}l\acute{o}$ ‘these oils’
 c. $b\acute{e}l\acute{e}$ ‘light’ H-L → $m\acute{i}$ $b\acute{e}l\acute{e}$ ‘this light’ $m\acute{i}$ $n\acute{a}$ $b\acute{e}l\acute{e}$ ‘these lights’
 d. $g\acute{a}r\acute{i}$ ‘garri’ L-H → $m\acute{i}$ $g\acute{a}r\acute{i}$ ‘this garri’ $m\acute{i}$ $n\acute{a}$ $g\acute{a}r\acute{i}$ ‘these garris’
 e. $\acute{b}\acute{a}$ $r\acute{a}$ ‘hand’ H-H → $m\acute{i}$ $\acute{b}\acute{a}r\acute{a}$ ‘this hand’ $m\acute{i}$ $n\acute{a}$ $\acute{b}\acute{a}r\acute{a}$ ‘these hands’

As with other melodies, the all L + one H pattern of /LH/ is especially evident on longer sequences:

- (15) a. $m\acute{i}$ + $f\acute{e}n\acute{i}$ + $n\acute{a}m\acute{a}$ → $m\acute{i}$ $f\acute{e}n\acute{i}$ $n\acute{a}m\acute{a}$ ‘this bird’s meat’
 H H-H H-H H L H
 b. $m\acute{i}$ + $m\acute{i}n\acute{j}i$ + $k\acute{u}k\acute{u}$ → $m\acute{i}$ $m\acute{i}n\acute{j}i$ $k\acute{u}k\acute{u}$ ‘this water pot’
 H L-L H-H H L H
 c. $m\acute{i}$ + $f\acute{e}n\acute{i}$ + $m\acute{i}n\acute{j}i$ + $k\acute{u}k\acute{u}$ → $m\acute{i}$ $f\acute{e}n\acute{i}$ $m\acute{i}n\acute{j}i$ $k\acute{u}k\acute{u}$ ‘this bird’s water pot’
 H H-H L-L H-H H L H

⁵ There is one exception to this statement. The possessive pronoun *ani* ‘its’ which was seen in (9) has a second function as a distal demonstrative. Thus, *ani namá* can mean ‘its animal’ or ‘that animal’ (Harry 2004:67).

d. mí + tubo + síri + námá → mí t̀̀bo síri námá ‘this child’s leopard
 H L-L H-L H-H H L H H meat’

As seen, after the demonstrative one obtains a long sequence of L tones followed by a single H tone at the end. This will be important for our diachronic account in §5.

2.4. /L/ melody: Quantifiers + Numerals 4-10 + N

As seen in (16), nouns receive an all L melody after the numerals ‘2’ and ‘4-10’, as well as after quantifiers:⁶

(16) f̀̀ni ‘bird’ → mà f̀̀ni ‘2’ s̀̀námá f̀̀ni ‘7’ ja f̀̀ni ‘some birds’
 íniá f̀̀ni ‘4’ níniá f̀̀ni ‘8’ t̀̀wá f̀̀ni ‘many birds’
 s̀̀námá f̀̀ni ‘5’ é́s̀̀niá f̀̀ni ‘9’ m̀̀dá f̀̀ni ‘how many birds?’
 s̀̀niá f̀̀ni ‘6’ óyá f̀̀ni ‘10’

The representative examples in (17) show that all tone patterns receive the /L/ melody after any of the above numerals and quantifiers:

(17) a. námá ‘meat’ H-H → s̀̀námá nàma ‘five animals’ t̀̀wá nàma ‘many animals’
 b. pulo ‘oil’ L-L → s̀̀námá p̀̀lo ‘five oils’ t̀̀wá p̀̀lo ‘many oils’
 c. béle ‘light’ H-L → s̀̀námá bèle ‘five lights’ t̀̀wá bèle ‘many lights’
 d. garí ‘garri’ L-H → s̀̀námá g̀̀rì ‘five garris’ t̀̀wá g̀̀rì ‘many garris’
 e. bárá ‘hand’ H-↓H → s̀̀námá bàra ‘five hands’ t̀̀wá bàra ‘many hands’

The same is true of longer nouns. Thus, /k̀̀k̀lí/ ‘fruit’ → s̀̀námá k̀̀k̀lí ‘five fruits’, t̀̀wá k̀̀k̀lí ‘many fruits’.

2.5. No melody assigned

In addition to the above melodies, a final tone pattern concerns four toneless kinship terms which are irregular after a possessive pronoun (Harry 2004:56). Rather than receiving the /HLH/ melody after a possessive, the tone of the possessive pronoun spreads onto them:

(18) a. dá ‘father’ L → i dá ‘my father’ í dá ‘your father’
 b. jingi ‘mother’ L-L → i yingi ‘my mother’ í yingi ‘your mother’
 c. di ‘husband’ L → i di ‘my husband’ í dí ‘your husband’
 d. ta ‘wife’ L → i ta ‘my wife’ í tá ‘your wife’

We will see in (32) below that a similar process occurs between an object and a verb.

2.6. No melody

⁶ The word *gb̀̀r̀̀ú* ‘one’ assigns HL, e.g. *gb̀̀r̀̀ú f̀̀ni* ‘one bird’ is therefore probably a noun. The numeral *tírá* ‘3’ is exceptional. It either assigns HL or spreads its H onto the base tone. Thus *pírì* ‘bush’ → *tírá pírì* ~ *tírá pírì* ‘three bushes’. The word *bébé* ‘whole’ appears to assign a /HL/ melody, hence functions as a noun: *bébé f̀̀ni* ‘whole bird’.

The last tone pattern to be considered concerns adjectives. As seen in (19), they do not assign a tone melody. Instead, the noun maintains its underlying tones.

- (19) a. *námá* ‘meat’ H-H → *opu námá* ‘big animal’
 b. *pulo* ‘oil’ L-L → *opu pulo* ‘big oil’
 c. *béle* ‘light’ H-L → *opu béle* ‘big light’
 d. *garí* ‘garri’ L-H → *opu garí* ‘big garri’
 e. *bá↓rá* ‘hand’ H-↓H → *opu bá↓rá* ‘big hand’

Finally, note that only a determiner can follow a noun, in which case there is no assigned melody, no tonal change:

- (20) a. *námá* ‘meat’ H-H → *námá mé* ‘the meat’
 b. *pulo* ‘oil’ L-L → *pulo mé* ‘the oil’
 c. *béle* ‘light’ H-L → *béle mé* ‘the light’
 d. *garí* ‘garri’ L-H → *garí↓ mé* ‘the garri’
 e. *bá↓rá* ‘hand’ H-↓H → *bá↓rá mé* ‘the hand’

3. Tone melodies in complex noun phrases

Having established the four tonal melodies in §2, each of which is assigned by a modifier to the following noun, the question we now ask is what happens if there is more than one such modifier. We already saw in (7), (11) and (12) that the respective /HL/ or /HLH/ melody is mapped over however many nouns may be in a genitive relationship. But what if the melodies conflict?⁷

For the purpose of addressing this question the structure of the Kalabari noun phrase is schematized in (21).

- (21) { Dem, Poss } + Num + Adj + Noun₁ + Noun₂ + Determiner
 LH> HLH> >L >HL

As seen, demonstratives and possessive pronouns, which are mutually exclusive, both precede numerals and adjectives, in that order. Not shown is the fact that a possessed Noun₂ can be preceded only by a numeral and/or adjective. Thus, the recursive structure of the noun phrase is (Num) (Adj) Noun. Recall that adjectives are the only modifiers that have no effect on a following noun. It thus interesting to observe that they occur closest to the modified noun. With this established, we can now ask the following two questions: (i) What happens if multiple modifiers precede the head noun? (ii) What happens if each noun is modified in an N₁ + N₂ construction?

The short answer is that the first word can always assign its tone melody to what follows—but there are also other possibilities. In what follows we will consider only a few of these, postponing to a later version of this study a more systematic coverage of all of the permutations we have uncovered. Let us first note, however, that if the first modifier on a head noun is a

⁷ In (11) and (12) we already saw that the /HLH/ melody assigned by the possessive pronoun overrides the /HL/ melody that an N₁ would have assigned to an N₂. Thus /i + féní + námá/ ‘my bird’s meat’ is realized *i féní námá* and not **i fě̀^hni námà*, where the pronoun assigns /HLH/ to the N₁ ‘bird’, and ‘bird’ assigns /HL/ to the N₂ ‘meat’. XX

Again, we postpone a presentation of the full set of variations we have uncovered and an ultimately more complete analysis. For our present purpose we are interested in trying to characterize the basic system and understand both its synchronic basis and its diachronic origin, to which we now turn.

4. Discussion

Now that we have seen the basic system, it is natural to ask how it relates to what we know from other languages. On the one hand there have been reports of lexical tone classes, i.e. words which arbitrarily assign one or another tone pattern to the next word. An example within Ijoid is Bumo, for which Eferé (2001:158-9) sets up the following four classes A-D:⁹

(27)	<i>class</i>	<i>schema</i>	<i>tone pattern determined by the A-D class of the phrase-initial word</i>	
	A	(L) H + H	all TBUs in the phrase = H	
	D	(L) H + HL	first word = all H, H spreads one TBU to the right; other TBUs = L	
	B	(L) H + L	first word = all H; subsequent TBUs = L	
	C	(L) HL + L	first word keeps its HL drop, remaining TBUs = L	

Illustration of the four classes in the frame .../náná kímí/ ‘man who owns/has...’, whose H tones are replaced by the indicated melodies:

(28)	A	(L) H + H	bélé	‘pot(s)’	→	bélé náná kímí	(H spreading to end)
	D	(L) H + HL	ikíé	‘friend’	→	ikíé nánà kìmì	(H spreading one TBU)
	B	(L) H + L	wárí	‘house’	→	wárí nàà kìmì	(no H spreading)
	C	(L) HL + L	sérì	‘scarf’	→	sérì nàà kìmì	(no H spreading)

In order to account for the effects on the next word, scholars have sometimes proposed complex underlying tonal schemas, as well as sequences of floating tones (Williamson 1988). Comparable examples from other parts of the world include Urarina in Peru (Olawsky 2006) and Yagari in New Guinea (Ford 1993). Despite obvious similarities (the first word determines the tonal pattern of the rest of the phrase), Kalabari doesn’t have this kind of lexical determination of phrasal tones. Instead, as we have seen, it’s by construction type: nominal vs. pronominal possessors, determiners vs. numerals etc.¹⁰

In surveying the different constructions, we have seen that the assigned tonal melody overrides the lexical tones of non-initial words. There is good reason to think of this as a two-step process: reduction + tone assignment. First, the lexical tones are deleted, then the toneless sequence receives a tonal melody determined by the nature of the initial word. We see evidence for this from closely related Nkoroo. Rather than receiving a /HL/ melody, the tone of N2 becomes all L after a L-L N₁ (Akinlabi, Connell & Obikudo 2009:449):

(29)	a.	mindì	‘water’	+	ikákí	‘tortoise’	H-H-H	→	mindì	ikàkì	‘turtle’
	b.	dùḍ	‘farm’	+	kírì	‘ground’	H-L	→	duḍ	kírì	‘village’

⁹ The (L) in parentheses refers to the fact that vowel-initial words can begin H or L, whereas consonant-initial words begin H. Again, only the tones of the first word are relevant.

¹⁰ Also noteworthy in this context is recent work on various Dogon languages, where most, but not all modifiers follow the noun. With interesting variation, there is a common process of reducing the tone of the noun to all L (Heath & McPherson 2012). Much of this will be the subject of study in McPherson (in progress).

(i) The L of the /LH/ melody is the result of tone reduction. The H of this melody is a final determiner tone.

(ii) The L of /HL/, /L/ and probably /HLH/ melodies again comes from reduction. The H of /HL/ is from a lost linker or “connective” particle, while the final /H/ may again originate as a mark of determination.

Starting with the first source, note in the examples in (36) that Kalabari has a system of final /H/ tone determiners which distinguish gender in the singular:

(36)		<i>singular</i>	<i>plural</i>	
a.	<i>masculine</i>	sírì b́é	sírì má	‘the (male) lion(s)’
b.	<i>feminine</i>	sírì má	sírì má	‘the (female) lion(s)’
c.	<i>neuter</i>	númé mé	númé má	‘the song(s)’

However, when the determiners accompany the proximal demonstrative *mí* ‘this’ (pl. *mí[↓]ná* ‘these’), the intervening words are all L:

(37)		<i>singular</i>	<i>plural</i>	
a.	<i>masculine</i>	bí s̀r̀í b́é	mí [↓] ná s̀r̀í má	‘this/these (male) lion(s)’
b.	<i>feminine</i>	má s̀r̀í má	mí [↓] ná s̀r̀í má	‘this/these (female) lion(s)’
c.	<i>neuter</i>	mí nùmè mé	mí [↓] ná nùmè má	‘this/these song(s)’

What we don’t get is *bí s̀r̀í b́é*, etc. Recall also from (22) that a demonstrative is consistent in assigning a /LH/ melody also in more complex noun phrases. We propose therefore to identify the H of the /LH/ melody with the mark of final determination. This could either mean that another /H/ tone morpheme was present or, more likely, that the final H seen on an overt determiner became generalized to noun phrases (or perhaps more aptly, determiner phrases) with an initial demonstrative or other determiner. The two-step development would have thus been to reduce everything after the initial determiner to L, followed by the assignment of a right-edge H.

A two-step reconstruction is also required for the remaining melodies. This time the H comes from a lost or reanalyzed connective particule that occurred in the relevant constructions. As our first piece evidence, we note that Kalabari currently maintains two overt connectives, *ná* and *b́é*, used in specific constructions only. As seen in (38), both have H tone and both make the following noun L:

(38)	a.	<i>ná</i> is used to mean ‘associated with’ a particular people or language	
		Kálábarì <u>ná</u> f̀èni	‘Kalabari bird’ (a bird that the Kalabaris have) (cf. f̀èní ‘bird’)
		HH H L	
	b.	<i>b́é</i> is used to indicate something associated with a place (whether a proper or common noun)	
		Dégéma b́é f̀iè	‘Degema food’ wá [↓] r̀í b́é nùmè
		HH H L (cf. f̀iè ‘food’)	HLH H L ‘the house song’ (cf. nùmé ‘song’)

To get the /HL/ melody of the N₁-N₂ construction, we assume that there was a /H/ tone connective that has since been lost. After the N₂ was reduced to all L, the H of the connective was assigned to the N₂ to produce the observe /HL/ melody.

The /L/ melody has a similar source. It might seem that all we need to say is that there was reduction to L after a quantifier or numeral. However, recalling the forms of numerals from (16), repeated as (39), we can say more:

(16)	fèni	‘bird’	→	mà fèni	‘2’	sónómá fèni	‘7’	ja fèni	‘some birds’
	íníá fèni	‘4’		níná fèni	‘8’	tǔwá fèni	‘many birds’		
	sóná fèni	‘5’		éséníá fèni	‘9’	indá fèni	‘how many birds?’		
	sóníá fèni	‘6’		óyá fèni	‘10’				

As seen, all of these numerals and quantifiers end in /a/, mostly with a H tone. If we assume that there was a connective /a/ in such constructions, it would seem that it fused with the preceding numeral or quantifier, thereby yielding the /L/ melody. This differs from the fate of the connective in N1-N2 constructions, since in this case it didn’t fuse, rather the segmental content was lost, with the H tone being set afloat producing the /HL/ melody by joining the reduced L.

This leaves the more complex /HLH/ melody assigned by possessive pronouns. We suggest a tripartite reconstruction of reduction to L both preceded and followed by a H: the first H would be the connective tone, the L from reduction, and the second H from the H of determination. In other words, the HL of /HLH/ is the same as the N₁-N₂ /HL/ melody, and the LH of /HLH/ is the same melody as assigned by demonstratives and other initial determiners.

With this reconstruction we can now better address question (iii) above, whether a corresponding system could potentially arise in the verb phrase. We think so. All it would take would be different postpositions marking objects, obliques etc. which could combine with a reduced all L verb pattern. As mentioned, the head of an XP often undergoes tone reduction, especially in the case of the verb, which may have fewer or no tonal contrasts to begin with. This raises the interesting question of whether such cases prosodic reduction of heads begins in the verb phrase or the noun phrase—with or without the additional complication of assigned melodies. What we can conclude from the Kalabari case, at least, is that tone patterns can be assigned by syntactic construction, something that rather, if ever, occurs with other phonological features.¹² As is well known, the tones of one word often affect the tones of another, whereas featural harmonies and stress assignment are word-bound. The situation in Kalabari thus directly confirms that tone can do so much more than any other phonological property at the phrase level.

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¹² Mark Van de Velde has suggested that we compare the tonal melodies with cases rather than with other phonological features. There are some differences, of course, but at least this does produce other instances of one word governing the form of another.

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