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Initial/Final Tone Agreement in Ekegusii (Bantu; Kenya)

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ABSTRACT: In this paper I present an unusual Bantu tonal phenomenon where certain "cells" in the verb paradigm require a tonal agreement between the first syllable (the subject prefix) and the last syllable (an inflectional ending). Such a long-distance dependency raises the question of whether it is tone alone that can do this. I first provide an overview of the phenomenon in Ekegusii (Kenya), and then show that a related construction in geographically and genetically distant Grassfields Bantu languages of Cameroon can help us understand both the nature and history of the more evolved situation seen in Ekegusii. I conclude that although initially surprising, initial/final tone agreement has a natural diachronic source and is not so crazy—even from a synchronic point of view.

KEYWORDS: tone; agreement; inflectional morphology; multiple exponence; noun classes.

1. Introduction[1]

In this paper I have four goals. The first goal is to share an unusual tonal phenomenon found in certain Bantu languages known variously as "tonal harmony"

[1] While José Hualde is most known for his extensive work on Basque and other Iberian languages, less known is his considerable knowledge of Bantu. As a graduate student at the University of Southern California, José was exposed to Bantu not only in phonology classes, but was also a star player in three field methods courses on Bantu languages: Basaá, Kirimi, and Kinande (see Hualde 1989a,b which also attest to his broad grammatical expertise). It must have been in one of these classes that I commented, citing a minority case from some part of world, that every family has a tonal offspring. In response, I remember some days later when José came into the department, his face beaming with delight, as he confirmed my pronouncement, announcing: "I have found tone in Basque!" The rest is history. Over the past several decades

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(Meeussen 1967: 113, 1971: 10), "tone copy" (Schadeberg 1989: 35), "first-last tone harmony" (Rolle & Bickmore 2022), and (as I first heard about it), "the Law of Initials and Finals" (2nd Colloquium on African Languages & Linguistics, Leiden, 1972; Hyman 2012: 109)[2] A simple example is seen in (1) from the Konda variant of Lomongo (Democratic Republic of Congo) cited by Nsuka Nkutsi (1982: 189):[3]

(1) a. bont' o-lang-a mí 'the person that I like' (lit. person 3sg-like I)
Ø Ø
person 3SG-like-FV 1SG
b. banto bá-lang-á mí 'the people that I like' (lit. people 3pl-like I)
H H
person 3pl-like-FV 1sg

As seen, the apparent tonal agreement is between the subject prefix (of various noun classes) and the inflection final vowel (FV).

My second goal is to discuss how such facts relate to the question which I have raised a few times, "tone: is it different?" (Hyman 2011: 214). Given that tone can show such apparent long-distance agreement, the question is whether any other phonological property can do the same.

Given the rarity of the phenomenon, my third goal is to show how (word-) "initial/final tone agreement" (IFTA) is realized in Ekegusii [ékegusií], a Bantu language spoken in Kenya, which has interesting properties of its own.

Finally, I want to show how IFTA came into being historically. For this I will draw on additional materials from geographically and genetically distant Grassfields Bantu languages of Cameroon. I will conclude that although initially surprising, IFTA has a natural diachronic source—and is not so crazy even from a synchronic point of view!

In the following sections I will first present initial/final tone agreement in Ekegusii (§ 2), then turn to a comparison with an interesting parallel in Grassfields Bantu (§ 3). This will be followed by discussion (§ 4) and a brief conclusion (§ 5).

2. Ekegusii tone patterns

Ekegusii [ISO: guz] is a Bantu language (Guthrie Bantu ref. JE42 (Maho 2009: 62)) spoken in Southwest Kenya East of Lake Victoria (with the Nilotic Dho Luo lan-

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Prof. Hualde has been a major inspiration to me, as he has been to many others working more generally on the synchronic, diachronic, typological, and theoretical analysis of tone, accent, and so much more. It is thus an honor to dedicate this paper to him on the occasion of his special birthday. Thank you, José!

[2] In Leiden, after presenting an earlier version of Hyman & Schuh (1974) on universals of tone rules, either André Coupez or Leo Stappers (I can't remember which) brought up the Bantu "Law of Initials and Finals" as falling outside Russell Schuh's and my generalizations (which were based on West African tone languages). A. E. Meeussen's response (which I remember quite well, since I was rather struck by hearing him speak French) was "Oui, mais il faut admettre que c'est le seul exemple que nous connaissions". Unfortunately I seem to be the only living Bantuist present at this very small CALL meeting (we all sat around one table) who remembers this.

[3] In (1) the subject prefixes belong to singular noun class 1 and plural noun class 2, which differ in tone. As seen, H(igh) tone is marked by an acute accent (´) and L(ow) tone is unmarked. Many Bantu languages are analyzed with a privative /H/ vs. Ø tone contrast rather than /H/ vs. /L/. This is the case in Konda as well as Ekegusii (§2).

guage intervening). While we first began study of Ekegusii in an undergraduate field methods course in Spring 2021, I have since followed up with extensive consultant work with Hildah Kemunto Nyamwaro (HK), originally from Ititi (a village East of Marani in SW Kenya). As seen in Table 1, Ekegusii distinguishes 15 noun classes illustrated on nouns and agreeing subject prefixes in the present habitual of the verb **/gó-/** 'fall'. As seen, the subject prefix tone is Ø (realized L) in the main clause affirmative, but differs in tone in relative clauses (where the initial/final agreement is also found): Class 1 **o-** and classes 4 and 9 **e-** are Ø tone, while the remaining classes are H.

Table 1

Noun Classes and Subject Prefixes in Ekegusii

Cl	Noun examples	Gloss	Noun prefix	Main clause 'X fall(s)'	Subject relative clause 'X who/which fall(s)'
1	**ɔ́-mɔ-gɛni**	'guest'	**ó-mo-**	**... a-gw-éété**	**... o-gw-éété**
2	**á-ba-gɛni**	'guests'	**á-ba-**	**... ba-gw-éété**	**... bá-gw-éété**
3	**ó-mo-té**	'tree'	**ó-mo-**	**... o-gw-éété**	**... ó-gw-éété**
4	**é-me-té**	'trees'	**é-me-**	**... e-gw-éété**	**... e-gw-éété**
5	**rí-i-gena**	'egg'	**rí-i-**	**... ri-gw-éété**	**... rí-gw-éété**
6	**á-ma-gena**	'eggs'	**á-ma-**	**... a-gw-éété**	**... á-gw-éété**
7	**é-ke-rógó**	'chair'	**é-ke-**	**... ke-gw-éété**	**... ké-gw-éété**
8	**é-bi-rógó**	'chairs'	**é-bi-**	**... bi-gw-éété**	**... bí-gw-éété**
9	**é-m̀-bórí**	'goat'	**é-N-**	**... e-gw-éété**	**... e-gw-éété**
10	**chí-m̀-bórí**	'goats'	**chí-N-**	**... chi-gw-éété**	**... chí-gw-éété**
11	**ó-ro-kó**	'firewood'	**ó-ro-**	**... ro-gw-éété**	**... ró-gw-éété**
12	**á-ka-té**	'tree (dim.)'	**á-ka-**	**... ka-gw-éété**	**... ká-gw-éété**
14	**ó-bo-tá**	'bow'	**ó-bo-**	**... bo-gw-éété**	**... bó-gw-éété**
15	**ó-ko-goro**	'leg'	**ó-ko-**	**... ko-gw-éété**	**... kó-gw-éété**

With this established, we are ready to turn to verb forms, which have the internal structure below (Meeussen 1967).

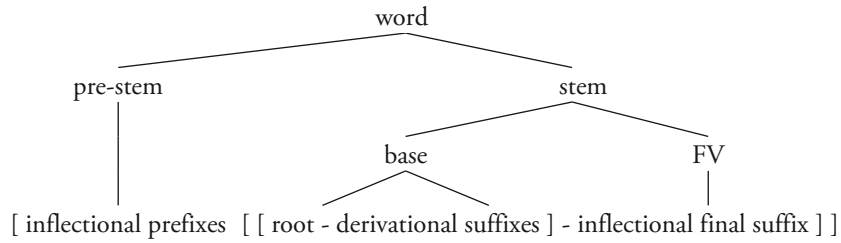

Figure 1

Bantu Verb Structure

In this study we will be particularly interested in the final tone of the stem, i.e. the root + possible derivational suffixes + an obligatory inflectional final suffix **/-a/**, **/-ɛ/**, **/-ete/**, or **/-ire/**.

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Turning to tone, verb roots can be either toneless, e.g. **/-sibor-/** 'untie' or have a /H/ on their first mora, e.g. **/-súgum-/** 'push'. When conjugated, almost all "cells" in the verbal paradigm have one of the following three tone patterns on their verb stem (Bickmore 1997, 1999; Hyman & Nyamwaro 2022; see also Cammenga 2002). In Tone Pattern I (TP1), there is no grammatical (or "melodic") tone. Thus in the following infinitive forms, the verb stem **/-sibor-/** is all Ø in (2a), while the underlying /H/ of **/-súgum-/** spreads one mora to the right:[4]

(2) a. **/sibor-/** 'untie' → **go-sibor-er-an-a** 'to untie for each other'
INF-untie-APPL-RECIP-FV

b. **/súgum-/** 'push' → **go-súgúm-er-an-a** 'to push to each other'
H H

As elsewhere, toneless moras receive a default L(ow) tone.

In Tone Pattern II (TPII), a suffixal or "melodic" H tone is assigned from the second to final moras of the verb stem, as in the present habitual main clause affirmative:

(3) a. **/sibor-/** 'untie' → **to-sibór-ér-án-á** 'we untie for each other'
H

b. **/súgum-/** 'push' → **to-súgúm-ér-án-á** 'we push to each other'
H H H

In (3a) this produces a stem with one toneless first mora [si] followed by all H tones moras, while in (3b) the stem begins with the root /H/ followed by all H tone moras. Recall from Table 1 that subject prefixes are Ø in main clause affirmative verb forms, hence **to-** 'we'.

In Tone Pattern III (TPIII) the subjunctive forms in (4) show a H on the final mora of the verb stem:

(4) a. /sibor-/ 'untie' → tó-síbor-er-an-ɛ́ 'let's tie for each other'
H H

b. /súgum-/ 'untie' → tó-súgum-er-an-ɛ́ 'let's tie for each other'
H H H

As also seen, the first mora of the stem is also H. The root-initial H of toneless **/-sibor-/** 'untie' in (4a) is from H tone spreading (HTS), triggered by the subject prefix **/tó-/** 'we', which is exceptionally /H/ in the subjunctive. As Bickmore (1997, 1999) points out, in TPIII the prefix that precedes the stem is always underlyingly /H/, hence there will always be HTS onto a following toneless mora (Bickmore 1997, 1999).[5]

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[4] In (2), the infinitive prefix /ko-/ becomes go- by a rule known as Dahl's Law which, in Ekegusii, dissimilates **/k/** to [**g**] when the following consonant is voiceless, here **/s/**.

[5] For possible approaches to explaining why there is no HTS from /-súgum-/, see Bickmore (1997, 1999).

The distribution of the three tone patterns across different tense-aspect-moods (TAMs) in main and relative affirmative and negative clauses is shown in the Table 2, where the different tense-aspect-moods (TAMs) are identified in the first column (the integers 1-4 refer to two different habitual constructions and to four degrees of past and future tense):

Table 2

Distribution of Tone Patterns in the Verbal Paradigm

TAM/ Root tone:	Main Clause Aff		Subject Rel Aff		Main Clause Neg		Subject Rel Neg	
	H	Ø	H	Ø	H	Ø	H	Ø
Habitual1								
Habitual2								
Progressive								
Perfect								
Past1			1	1			1	1
Past2			1	1			1	1
Past3								
Past4								
Generic			2	2				
Perf 'since'								
Perfect Inverse			2	2				
Past12 Inverse			1	1			1	1
Past234 Inverse								
Future1 =Prog								
Future234								
Imperative								
+Obj prefix								
Subjunctive								
+Obj prefix								
Should								
Past23 consec								
Dubitative Perf			2	2				
Infinitive								

In the table TPI = yellow, TPII = green, and TPIII = orange. The exceptional blue cells have a H from the stem second mora to the penult, while grey indicates non-existent cells. An important thing to notice is that /H/ and Ø roots mostly take the same tone pattern in any given TAM. Among these are two exceptional

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TAMs, the Generic and the Perfect Inverse, both of which show the green pattern when the root is /H/ vs. the orange pattern when the root is Ø.[6] These will be important for understanding initial/final tone agreement, to which we now turn.

3. Initial/final tone agreement

Of 156 cells in the main and subject relative clause paradigms in Table 2, 18 (outlined in bold) show a tonal agreement between the subject prefix and the FV, the focus of this paper. There are in fact two different initial/final tone agreement (IFTA) patterns marked 1 (orange) and 2 (green). The first pattern (IFTA-1) indicated by the bolded orange cells is exemplified in (5) from the (yesterday) Past2 relative clause negative (**-tá-** 'negative', **-á-**…**-ete** 'Past2').

(5) a. with /H/ tone subject prefix /bá-/ 'they' (human class 2)
/súgum-/ 'push' → á-ba-nto bá-tá-á-súgum-eté 'people who didn't push'
H H H H H H
/sibor-/ 'untie' → á-ba-nto bá-tá-á-síbor-eté 'people who didn't untie'
H H H H

b. with toneless (Ø) subject prefix /o-/ 's/he' (human class 1)
/súgum-/ 'push' → ó-mo-nto o-tá-á-súgúm-ete 'person who didn't push'
H Ø H H H Ø
/sibor-/ 'untie' → ó-mo-nto o-tá-á-sibor-ete 'person who didn't untie'
Ø H H Ø

In (5a) we see that IFTA-1 maintains the /H/ on the FV if the subject prefix is /H/, while the final /H/ is not present in (5b), where the subject prefix is Ø. In other words, the presence vs. absence of the suffixal /H/ agrees with the presence vs. absence of /H/ on the subject prefix.

In IFTA-2 (the bolded green cells in Table 2), a different dependency is observed. The following dubitative perfect ('might have') forms marked by the prefix **/ka-/** (→ **ga-** before **/s/**) and final inflectional ending exemplify this second pattern:

(6) a. with /H/ tone subject prefix /bá-/ 'they' (human class 2)
/súgum-/ 'push' → á-ba-nto bá-gá-súgúm-été
H H H H
'people who might have pushed'
/sibor-/ 'untie' → á-ba-nto bá-gá-sibór-été
H H H
'people who might have untied'

[6] The other exceptions include a Perfect that occurs in certain contexts, e.g. after 'since', where /H/ roots take the orange pattern and Ø roots take the green, and the "polar" tone of the imperative affirmative, where /H/ roots take the yellow pattern (**súgum-a** 'push!') and Ø roots take the green (**sibór-á** 'untie!'). For more on these and all tone patterns see Hyman & Nyamwaro (2022).

b. with toneless (Ø) subject prefix /o-/ 's/he' (human class 1)

/súgum-/ 'push' → ó-mo-nto o-ga-súgúm-ete

H H

H

'person who might have pushed'

/sibor-/ 'untie' → ó-mo-nto o-ga-sibór-ete

H

'person who might have untied'

In (6a), where the subject prefix is /H/, the suffixal H links from the second mora to the FV, as expected. In contrast, when the subject prefix is Ø, the still present suffixal H can only reach the penult. Thus, in IFTA-2 only the last syllable agrees with the /H/ vs. Ø tone of the subject prefix.

The above exemplifies how IFTA affects TAMs in which /H/ and Ø roots receive the same (orange or green) tone pattern. In the relative clause affirmative of the generic and perfect inverse TAMs, however, /Ø/ verbs take the orange pattern, while /H/ verbs take the green. These forms are therefore expected to be subject to both IFTA-1 and IFTA-2, respectively. However, this prediction is only partially fulfilled. To show this I cite examples from the productive process of deverbal adjective formation, based on the generic in Table 2 (cf. **á-ba-nto bá-súgúm-eté** 'people who push', **á-ba-nto bá-síbor-eté** 'people who untie'). The following relative forms in singular class 1 and plural class 2 were among 82 "adjective" entries derived from the generic relative with final **-ete** in the online version of Bosire & Machogu's (2009) dictionary (12,991 entries):

(7)					
a.	-kú-	'die'	**ó-mo-nto o-kw-éété**	'dead person'
	H		**á-ba-nto bá-kw-éété**	'dead people'
	-írok-	'fear'	**ó-mo-nto o-iróg-éte**	'fearful person'
	H		**á-ba-nto bá-íróg-eté**	'fearful people'
	-nyágaar-	'be greedy'	**ó-mo-nto o-nyágár-éte**	'greedy person'
	H		**á-ba-nto bá-nyágár-eté**	'greedy people'
b.	-rɔs-	'be tired'	**ó-mo-nto o-ros-éte**	'tired person'
	Ø		**á-ba-nto bá-rós-eté**	'tired people'
	-kiriny-	'be stationary'	**ó-mo-nto o-kiríny-éte**	'stationary person'
	Ø		**á-ba-nto bá-kírin-eté**	'stationary people'
	-manyekan-	'be well known'	**ó-mo-nto o-manyékán-éte**	'well-known person'
	Ø		**á-ba-nto bá-mányekan-eté**	'well-known people'

In (7a), /H/ roots take the IFTA-2 green pattern: (H from the second mora to the FV) when the subject prefix is /H/ (**bá-**) vs. blue (H from the second mora to the penult), when the subject prefix is Ø (**o-**). In (7b), Ø roots take the orange pattern (H on the FV) when the subject prefix is /H/, as in IFTA-1, but the blue pattern (H from the second mora to the FV) when the subject prefix is Ø. However, rather than losing the FV H, as in IFTA-1, Ø roots are realized with the blue pattern.

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This is because the Ø tone subject prefix **o-** first conditions a switch to the green pattern (H from the second mora to the FV) as expected when the pre-stem syllable is Ø (Bickmore 1997, 1999; Hyman & Nyamwaro 2022).[7] This then undergoes IFTA-2 to become the blue pattern (H from the second mora to the penultimate). The realizations in (7b) thus do not realize a new pattern, rather the inputs are different for /H/ vs. Ø subject prefixes. The IFTA generalizations can thus be stated as in (8).

(8)

input pattern		IFTA pattern
a. green (H on second mora to FV) subject prefix = /H/		green (no change)
b. green (H on second mora to FV) subject prefix = Ø	→	blue (H on second mora to penult)
c. orange (H on FV) subject prefix = /H/		orange (no change)
d. orange (H on FV) subject prefix = Ø	→	yellow (no suffixal H)

Finally, note that yellow cells in the paradigm that lack a suffixal H do not show IFTA.

This completes the survey of IFTA patterns in Ekegusii. The IFTA facts seen in the previous section raise six related questions: (i) Why does IFTA occur only in some tenses? (ii) Why does IFTA occur only in subject relative clauses? (iii) Why are there two patterns of IFTA? (iv) Why does IFTA happen at all? (v) What else is like IFTA? (vi) Is this phonology or morphology? In response to this last question, I will agree with Rolle & Bickmore (2022) that it is morphology, which in turn affects the answers to the other questions. To show this, I will now shift to languages of the Ring subgroup of Grassfields Bantu in Cameroon. Although very distantly related and located 2,500 miles away, these languages have a deverbal adjective formation process which is strikingly similar to Ekegusii in (7).

4. Deverbal adjective formation in Grassfields Bantu

The Ring Grassfields Bantu languages have a process of deriving adjectives from verbs (as we saw in Ekegusii).[8] This process is perhaps most highly developed in Kom, illustrated below with classes 19, 10 and 13 adjectives derived from the verb **báŋ** 'to be red':

(9)

a. class 19:	**ə-fə-tám**	**fə-báŋ-nɔ́-fə**	'a red fruit'
b. class 10:	**ə-mbām**	**sə-báŋ-lɔ́-nɔ́-sɔ́**	'red snakes'
c. class 13:	**ə-tə-bíī**	**tə-báŋ-lɔ́-nɔ́-tɔ́**	'red kolanuts'

[7] The class 1 subject prefix is **o-** in subject relative forms, but **a-** in main clauses and non-subject relative forms. In the main clause affirmative generic, all subject prefixes are realized with H tone, e.g. class 1 **á-**: **á-súgúm-été** 's/he pushes', **á-síbor-eté** 's/he unties'. Since the the tone of the **o-** prefix is Ø in subject relatives, it triggers the green suffixal tone pattern (H from the second mora to the FV), which then undergoes IFTA-2 to become the blue pattern (H from the second mora to the penult).

[8] The data cited in this section are from my personal fieldnotes from Cameroon (1974, 1977).

In the above, **-nə́-** is the verb to adjective derivational morpheme, while **-lə́-** is an individuating pluractional morpheme. What is crucial is that the noun class agreement markers co-occur as prefixes and suffixes.[9] As both are required, this is clearly a case of multiple exponence.

What is important for our understanding of IFTA is that the prefixes and suffixes on deverbal adjectives agree in (underlying) tone! This is seen in the following four languages in Table 3.

Table 4

Adjective Prefixes and Suffixes in Four Grassfields Languages

class		Weh		Aghem		Mmen		Kom	
		prefix	suffix	prefix	suffix	prefix	suffix	prefix	suffix
1	sg.	ù-	-wə̀	ò-	Ø	ə̀-	Ø	ə̀-	Ø
2	pl.	á-	-wə́	á-	-ɣɔ́	ə́-	-ɣé	ɣɨ́-	-ə́
3	sg.	ú-	-wə́	ó-	-wɔ́	ə́-	-vé	ə́-	-ə́
4	pl.	í-	-zə́	é-	-zɔ́			í-	-í
5	sg.	í-	-zə́	é-	-zɔ́	é-	-zé	í-	-í
6	pl.	á-	-ɣə́	á-	-ɣɔ́	ə́-	-ɣé	á-	-á
7	sg.	kɨ́-	-kɨ́	kɨ́-	-kɔ́	(k)ə́-	-ké	á-	-á
8	pl.	ú-	-wə́	ó-	-wɔ́	ə́-	-vé	ə́-	-ə́
9	sg.	ì-	-zə̀	è-	Ø	ə̀-	Ø	ì-	Ø
10	pl.					sé-	-sé	sə́-	-sə́
13	pl.	tɨ́-	-tə́	tɨ́-	-tɔ́	tə́-	-té	tə́-	-tə́
19	sg.	fɨ́-	-fə́	fɨ́-	-fɔ́	fə́-	-fé	fə́-	-fə́
6a	pl.	Ǹ-	-mə̀	Ǹ-	-mɔ̀	mè-	-(m̀)	Ǹ-	-̀

As indicated by the shading, classes 1, 9 and 6a have L(ow) tone prefixes and suffixes, while the remaining classes have H tone prefixes and suffixes. We also see that the L tone suffixes are subject to reduction and loss. The following examples from Weh (personal field notes, 1977) and Aghem (Hyman 1979: 33) show the tonal differences in the prefixes and the agreeing suffix tone. This is seen in a comparison of the following forms from very closely related Weh and Aghem, where the forms of /L/ tone classes 1, 9 and 6a are shaded:

[9] While there are several segmental differences between a prefix and its corresponding suffix, the tones are underlyingly the same. By a general rule in Kom, the /H/ of noun prefixes is automatically lowered to M(id) word-initially. Thus, after H tone spreading and prefix H lowering to M, the /H-H-L/ tone of **/ə́-fə́-ɣàm/** 'mat' is realized M-M-HL [**ə̄-fə̄-ɣâm**].

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Table 5

Adjective Agreement in Weh and Aghem

Weh					Aghem		
class		**noun**	**adjective**	**gloss**	**noun**	**adjective**	**gloss**
1	sg.	wà	ù-tăw-wə̀	'strong child'	fɨ̀l	ò-dùú	'big child'
2	pl.	wá	à-táw-wə́	'strong children'	fɨ̀l	à-dú$^{+}$ú-ɣɔ́	'big children'
3	sg.	lɨ́ŋ	ù-táw-wə́	'strong bamboo'	kǫ̀ʔ	ò-dú$^{+}$ú-wɔ́	'big ladder'
4	pl.	lɨ́ŋ	ì-táw-zə́	'strong bamboos'	kǫ̀ʔ	è-dú$^{+}$ú-zɔ́	'big ladders'
5	sg.	kɨ́m	ì-táw-zə́	'strong crab'	ɣóm	è-dú$^{+}$ú-zɔ́	'big egg'
6	pl.	kɨ́m	à-táw-ɣə́	'strong crabs'	ɣóm	à-dú$^{+}$ú-ɣɔ́	'big eggs'
7	sg.	fɨ́	kì-táw-kə́	'strong thing'	fú	kì-dú$^{+}$ú-kɔ́	'big rat'
8	pl.	fɨ́	ù-táw-wə́	'strong things'	fú	ò-dú$^{+}$ú-wɔ́	'big rats'
9	sg.	ndɔ̀ŋ	ì-tăw-zə̀	'strong horn'	ɲɔ̀	è-dùú	'big animal'
13	pl.	ndɔ́ŋ	tì-táw-tə́	'strong horns'	ɲɔ́m	tì-dú$^{+}$ú-tɔ́	'big animals'
19	sg.	nə́n	fì-táw-fə́	'strong bird'	nwɨ́n	fì-dú$^{+}$ú-fɔ́	'big bird'
6a	pl.	nə́n	ǹ-tăw-mə̀	'strong birds'	nwɨ́n	ǹ-dùú-mɔ̀	'big birds'

While the class 1, 9 and 6a suffixes are clearly L tone and the others H in Weh, all of the prefixes are L on the surface. (Aghem is the same except that classes 1 and 9 have lost their suffix.) However, both languages provide evidence that the prefixes of classes other than 1, 9 and 6a are underlyingly /H/. First, as seen in the Weh forms, the /H/ of the verb /-táw-/ 'be strong' becomes a LH rising tone after class 1, /ù-/, class 9 /ì-/ and class 6a /n-/. This is a result of the L tone spreading rule exemplified in (10a).

(10) a. Weh: ǹ- táw -mə̀ [ǹ-tăw-mə̀]

L H L

b. Aghem: [fì- dù ú -fɔ́ [fɨ́-dú$^{+}$ú-fɔ́]

#L H L H H

Since the prefixal L of classes other than 1, 9, and 6a does not spread, we can assume that it is /H/, but subject to a lowering rule which counterfeeds L tone spreading. Evidence for a word-initial boundary #L is more explicitly motivated in Aghem. As seen in (10b), this #L links to the /H/ of the prefix **/fɨ́-/**, which spreads onto the L mora of **/-dùú-/**. Since the resulting contours of what would be LH-HLH-H are not permitted, the /H/ of **/fɨ́-/** delinks, as does the L of **/-dùú-/** which standing be-

tween two Hs produces the indicated downstep (ˈ). There can thus be no question that there is tonal agreement between the prefixal and suffixal agreement markers.

Grassfields paired prefixing and suffixing is clearly a case of "multiple exponence", i.e. double marking of noun class agreement by initial and final morphemes that combine segmental and (identical) tonal exponents: H prefix + H suffix, L prefix + L suffix. As also observed in Table 4, the above languages show cases where the segmental content of a L tone suffix has fallen out, with two different effects. First, the class 1 suffix **-wə** and class 9 suffix **-zə** seen in Weh drop out in closely related Aghem, leaving no trace: **fɨl ò-dùú** 'big child' (class 1), **ɲɔ̀ è-dùú** 'big animal' (class 9). Second the class 6a suffix ***-mə** seen in the Weh and Aghem examples in Table 5 drops out in Kom (as it does optionally in Mmen), leaving its L tone:

(11) a. class 19: **ə-fə̄-tám** **fə̄- fə́m- nə́- fə́** 'a black fruit'
H H H H

b. class 6a: **ə-mə̄-tám** **m̀- fə̀m- lə́- nə̂** 'black fruits'
=
L H H H L

The class 19 adjective form in (11a) has all /H/ tones, although the initial prefixal /H/ lowers to M. The corresponding class 6a plural in (11b), however, has a nasal prefix and a floating L suffix which links to the preceding **/nə́-/** adjective-forming suffix, now realized with a HL falling tone.[10] Given the loss of the segments of the historical class 6a agreement suffix ***-mə** with its L tone remaining, we see how a tonal agreement can come into being. We are thus now ready to return to Ekegusii.

5. Bantu initial/final tone agreement

In considering the Grassfields data in § 4 we see how a construction that requires a corresponding prefix and suffix with the same tone can naturally lead to IFTA. What we have just seen in Kom supports the position originally staked out by Meeussen (1971: 10):

> [T]he same analysis and interpretation now offers itself for a number of other Bantu languages, as also for Proto-Bantu: instead of tonal harmony at a distance, there is a repetition of the initial morpheme at the end of the word, but in such a way that it is reduced to mere tone — except if this repetition is propped up by a pronominal (**-e**) or anaphoric (**-o**) support, as in Swahili.

In his last remark, Meeussen is referring to Swahili examples such as the following (Mpiranya 2015: 73):

(12) **ki-tabu** **ki- fund-ish-a** **=cho** **ku-soma** **ni** **hiki**
7-book 7SUBJ-learn-CAUS-FV=7REL INF-read COP 7this
'the book which teaches reading is this one'

[10] In the output, the final **/m/** of the root **/-tám/** fuses with the **m-** prefix on the adjective, such that what one hears is **[ə-mə̄-tám̀ fə̀m-lə́-nə̂]**.

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In (12) the relative clause is marked by a **ki-** subject prefix and a **=cho** (**/ki-o/**) enclitic, both agreeing with class 7 **ki-tabu** 'book'. Swahili has lost its tones, but historically both the class 7 subject prefix and the class 7 enclitic reconstruct with *H tone (and are realized as such in other Bantu languages). The subject prefix and enclitic would both have been *L in Proto-Bantu. The question then is how the two IFTA patterns arose in Ekegusii.

Recalling the 18 bolded cells in Table 2, the important observation is that only orange (H on the FV) and green (H on the second mora to FV) tone patterns are affected by IFTA. Since those TAMs that lack a suffixal H are not affected we have to assume either that they never acquired the enclitic, or that the *H enclitics fell into disuse without leaving their H behind. In fact, among the yellow relative clause cells in Table 2, all are built on the **/ko-/** infinitive as in (13a) except for the negative perfect in (13b).

(13) a. **ó-mo-nto** **o-go-sibor-a** 'person who unties' (Habitual)
á-ba-nto **bá-a-go-sibor-a**[11] 'people who untie'
SBJ-HAB-INF-untie-FV

b. **ó-mo-nto** **o-tá-ráa-sibor-a** 'person who hasn't untied' (Perfect)
á-ba-nto **ba-tá-ráa-sibor-a** 'people who haven't untied'
SBJ-NEG-PERF-untie-FV

What we can take from this is that only the *L enclitic affected the two tone patterns, at least in Ekegusii. Although infinitive-based TAMs are recent, it is still necessary to assume two kinds of H suffixes in Ekegusii (and many other Bantu languages): the orange pattern which realizes the H on the FV and the green pattern which maps the H from the second mora to the FV. I propose to account for IFTA-1 and IFTA-2 in the following way:

To account for IFTA-1 I propose in (14) that the orange FV H pattern is reconstructable as a LH sequence. The function of the L is to keep the H from spreading up to the second mora of the stem.[12]

(14)	Subj-	Root	-Suff	=Rel	
a.	H	H	LH	H	→ root-initial H + final H
b.	H	L	LH	H	→ final H
c.	L	H	LH	L	→ root-initial H + bounded HTS onto M2
d.	L	L	LH	L	→ all L stem[13]

As seen, the relative enclitic was either *H or *L. When it was *H, as in (14a,b), the H simply fused with the suffixal LH. Hence there was no tonal effect. When the enclitic was *L, as in (13c,d), it replaced the H of the LH suffix. Since this

[11] The habitual is marked by vowel lengthening which is realized only when the preceding prefix is CV-. Thus compare **bá-á-gó-sibor-a** 'they untie', **tó-ó-gó-sibor-a** 'we untie' vs. **á-gó-sibor-a** 's/he unties', **ó-gó-sibor-a** 'you (sg.) untie'.

[12] See Schadeberg (1989) for discussion of suffixal tonal complexes in Nyamwezi.

[13] Recall from (4a) that the root-initial H is from H Tone Spreading, as the prefix preceding the root always has an underlying/historical /H/ (Bickmore 1997, 1999).

H would have been on the FV, this means that a final HL tone was simplified to L.[14]

Turning to IFTA-2, its source is as proposed in (15).

(15)

	Subj-	Root	-Suff	=Rel	
a.	H	H	H	H	→ root-initial H + H from second mora to FV
b.	H	L	H	H	→ H from second mora to FV
c.	L	H	H	L	→ root-initial H + H from second mora to penult
d.	L	L	H	L	→ H from second mora to penult

As seen, in this case the suffixal *H tone maps from the second mora to the FV (the green pattern). The *H relative has no effect, while the *L relative enclitic links to the FV, perhaps creating an intermediate final HL falling tone, but ultimately producing the final L as seen in the blue pattern. In the introduction I mentioned that Ekegusii and many other Bantu languages are analyzed synchronically with privative /H/ vs. Ø. The main reason is that the non-H Ø tone is phonologically inactive: It may become H by rule, but is otherwise typically realized with a default L pitch. In the above reconstruction the non-H tone is clearly an active L tone. If correct, this would mean that *H and *L must both reconstructed at the Proto-Bantu level with privative systems evolving later.

An important caveat that must be mentioned, however, is that IFTA takes on different properties in different Bantu languages. As was seen in (1), the Konda dialect of Lomongo shows IFTA in non-subject relative clauses, whereas it exists only in subject relatives in Ekegusii. The tonal effects can also be quite diverse (cf. the discussion of Chilungu in Rolle & Bickmore 2022).

6. Conclusion

At the end of § 3 I raised six questions to which I now return:

(i) Why does IFTA occur only in some tenses? For various historical reasons some tenses allow the post-verbal relative enclitic and others do not. In this context, note that the Swahili relative enclitic in (11) only occurs in the present tense of the indicative mood (Mpiranya 2015: 73). Why this should be would take us far beyond the goals of this paper. Suffice it to say that restriction of IFTA to only a subset of TAMs is quite typical.

(ii) Why does IFTA occur only in subject relative clauses? In Ekegusii only these allow the post-verbal relative enclitic. There are, however, other Bantu lan-

[14] In an October 29, 2021 colloquium at Stony Brook University and a November 8, 2021 Phonology Zoom presentation, I instead assumed that the suffixal tone was *L. However, this can't account for the fact that the orange pattern characterizes several of the TAMs in all clause types. Since the main clauses clearly require the reconstructed suffix to have a *H tone, the only alternative would be to assume that the corresponding subject relative clauses lacked this *H. In this case, we could derive IFTA from the *H relative enclitic. (A further issue is that the H of the LH suffix could itself have been an enclitic.) However, since final HL > L is needed in IFTA-2 (see (15)), I have tentatively chosen the interpretation in (14). Since Bantu languages show differences, a cross-linguistic study of IFTA would be especially welcome in resolving these issues.

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guages which, like Kondo dialect Lomongo, repeat a post-verbal subject in non-subject relative clauses, e.g. Nzadi (Hyman 2012: 101):

(16) mwàán (nà) àkáàr ò món bɔ̌ 'the child that the women saw'
child (that) women$_i$ PAST see they$_i$

(iii) Why are there two patterns of IFTA? As proposed in (14) and (15), the input TAMs of IFTA-1 ended *LH suffix, while those of IFTA-2 ended in a *H suffix.

(iv) Why does IFTA happen at all? As indicated in the quote from Meeussen (1971) above, the segmental content of the relative enclitics falls out, leaving their tone, which was identical to the tone of the corresponding subject prefix.

(v) What else is like IFTA? Would it be surprising if we found: initial/final agreement in nasality? ATR? vowel length? Given the historical steps that lead to IFTA, other such dependencies would require that the corresponding prefix and suffix agree in some other phonological feature which, like tone, would remain after the loss of the consonants and vowels of one or the other affix. While nasality seems the most likely candidate, I am unaware of any such case having been reported.

(vi) Is this phonology or morphology? Here I will agree with Rolle & Bickmore: It's morphology. IFTA is not best analyzed as a single /H/ or /L/ tone that links to both the initial and final mora as in as in the following examples from (5):

(17) a.

				H	
/súgum-/	'push'	→	á-ba-nto	bá- tá- á- súgum-eté	'people who didn't push'
H				H H H H H	

b.

				L	
/súgum-/	'push'	→	ó-mo-nto	o- tá- á- súgúm-ete	'person who didn't push'
H				Ø H H H Ø	

As Schadeberg (1989: 35) puts it: "It would be unrealistic, phonetically, to assume some kind of long distance assimilation between the subject concord and the Final, across a variable and potentially very large number of tone bearing elements." Rolle & Bickmore (2022: 225) argue against such a (morphologically conditioned) phonological account on the basis of "typological precedence, computational complexity, and (to a lesser extent) learnability in a laboratory setting". First, there are no other clear cases requiring initial/final identity reported in the literature. Second, experimental studies cited by Rolle & Bickmore reveal a difficulty in learning artificial languages requiring initial/final phonological identity. Of course it appears that tone is computationally different from other phonology (Jardine 2016), but not to the extent that would be required of a language where all words have to start and end with the same tone, as represented in Table 6.[15]

[15] This language resembles Heinz's (2018: 143) unattested "Language X" requiring initial/final s(h)ibilants to agree as [s] or [ʃ], the difference being that words in that hypothetical language would presumably be allowed to exist without either consonant.

Table 6

A language that requires words to begin and end with the same tone

Initial/Final L		Initial/Final H	
grammatical	**ungrammatical**	**grammatical**	**ungrammatical**
L		H	
LL	*LH	HH	*HL
LLL	*LLH	HHH	*HHL
LHL	*LHH	HLH	*HLL
LLLL	*LLLH	HHHH	*HHHL
LLHL	*LLHH	HHLH	*HHLL
LHLL	*LHLH	HLHH	*HLHL
LHHL	*LHHH	HLLH	*HLLL

We might add that it is hard to imagine a diachronic scenario that would produce the above system. I refer to this observation as Greenberg's Edict (Hyman 2008: 127): "... no diachronic change gives rise to a synchronically non-existent type" (Greenberg 1966: 510). By recognizing that IFTA is morphological we can now fit it in with other types of "multiple exponence": The appropriate TAMs in the appropriate constructions (subject relative clauses in Ekegusii) require marking in different parts of the verb structure in Figure 1. Some of this marking is tonal, which should not be surprising. As we have noted elsewhere, "... tonal morphology . . . exhibits essentially the same range of morphological properties as in all of segmental morphology" (Hyman & Leben 2000: 588). In other words, "If tone can be a morpheme, then it can do anything a morpheme can do!" (Hyman 2011: 204).

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[16] As of this writing (April 25, 2022), this link no longer takes one to the actual dictionary. I am hopeful this will be fixed as this is a very valuable resource for the study of Ekegusii.

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