High vowel reduplication and infix genesis in Isu (West Ring)*

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1 Introduction

Isu is a Grassfields Bantu language of the Ring subgroup closely related to Aghem (Hyman 1979) and spoken by about 10000 people (Gordon 2005) in the North Western province of Cameroon (Breton & Fohtung 1991). From a purely formal perspective, two types of reduplication could be distinguished on the level of word formation: partial vs. total root reduplication. While total root reduplication seems to be restricted to occasional instances of lexicalised noun stems (section 2.1), partial reduplication turns out to be more productive. It is of the high vowel reduplication type and serves to derive an intensive participle stem from quality verbs and adjectives (section 2.2), both formally and functionally linking up to the widespread West African high vowel reduplication which involves the reduplication of the initial consonant and inserts an underspecified high vowel.

In a historical perspective, high vowel reduplication, as attested for intensive function in Isu and for intensive and progressive functions in related Babungo, provides the key to the understanding of another phenomenon in Isu (and other closely related Ring languages such as Zoa) which would seem an obscure oddity otherwise: a palatal infix for causative, pluractional and imperfective functions (section 2.3). In the framework of grammaticalisation and morphophonological condensation, this palatal infix is proven to be the result of the reduction of a prior high vowel reduplication (section 3). Taking a wider perspective, these finding are integrated into a unified model of the reduction of total reduplication in Benue-Congo via high vowel reduplication, high vowel infixation and initial consonant mutation (section 4).

2 Types of reduplication

Reduplication – an iconic device used to encode aspects of the quantity of an action or its participants, the intensity of an action or emotional involvement (Ameka 1999, Heine & Reh 1984: 46-48, Marantz 1994, Moravcsik 1978, Westermann 1944) – is basically of two types in Isu: total reduplication and partial initial high vowel

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reduplication.[1] Under total reduplication the entire lexical root is repeated (1a), whereas initial high vowel reduplication repeats the initial consonant of the lexical root as a prefix and inserts a high central vowel (1b). Both types of reduplication apply to the lexical root, i.e. nominal prefixes such as *mə̀ŋ-* (class 6a in 1a) and *kə́-* (class 7 in 1b) are not affected.

(1) Types of reduplicative patterns in Isu

(a) Total reduplication: $C_1V_1C_2(V_2)$-$C_1V_1C_2(V_2)$
Example: *mə̀ŋ-kwə̀lə̀-kwə̀lə̀̃* 'hook worms'

(b) Partial initial high vowel reduplication: C_1ɨ-$C_1V_1(C_2V_2)$
Example: *kə́-tsɨ́-tsáʔá* 'clod of soil, lump of earth, soil particle'

Syntactic repetitions such as (2-4) are excluded from this description since they do not represent instances of reduplication in the sense that they form new lexical items, they rather operate on the syntactic level and constitute a strategy which is used for the purpose to emphasize the duration or repetition of events and actions (2a-c) or the intensity of their impact (3-4). The reduplication of the quantifier *dzɨ̀m* 'all' in (4a) puts emphasis on the totality of the action which is absent in (4b).

(2) Syntactic repetition of verbal phrases

wán	ˡ*ə́*	*zù̀w*	*dɔ̀ʔɔ́*	*yɪ́yˡ*	*dɔ̀ʔɔ́*	*yɪ́yˡ*	*dɔ̀ʔɔ́*	*yɪ́yˡ*
child	D1	go	stay	such	stay	such	stay	such

'The boy went and stayed and stayed and stayed.'

(b) ˡ*wá zʊ́ʔɪ́ yɪ́yˡ zʊ́ʔɪ́ yɪ́yˡ zʊ́ʔɪ́ yɪ́yˡ kàmbá bù bʊ̀lɪ̀ yə̀̃*
child learn such learn such learn such instead come
become.an.expertCFG
'The child learned and learned and learned until it became an expert instead.'

(c) *yə́ˡ wán ə̀ kɔ̀ʔ yə́ˡ mbám*
as child D1 see CFG cobra

ú tsə̀ŋ tsɪ̀y kə́ ɪ̀tsɪ̀y ɲɪ́ŋə́ yɪ́yˡ
S3sg.human.P3 immediately pass only pass run such

[1] Field research in 2002 and 2003 was not specifically geared towards identifying types of reduplication in the target language; the present contribution rather results from looking through a fixed corpus of elicited data and six narrative texts. Due to these limitations, it might be the case that other types of reduplication show up or that reported types receive a different dimension in the course of a more detailed study.

ɲɨ́ŋə́ yɪ́ʸ ɲɨ́ŋə́ yɪ́ʸ ɲɨ́ŋə́ yɪ́ʸ ...
run such run such run such

'As the boy saw the cobra, he immediately started running, running, running …'

(3) Syntactic repetition of verbs and adverbials

ɲɪ́ ˡyə́ zàŋì zàŋì 'eat fast!'
eat CFG be.fast be.fast

ɲɪ́ yə̀ mbáb mbáb 'eat fast!'
eat CFG fast fast

(4) Syntactic repetition of nominal modifier *dzɪ̀m* 'all'

(a) *ú ˡnɪ́ə kə́ tə̀ŋgúɔʔ bə̀ŋ á yɪ́ʸ,*
S3sg.P3 eat.fruit DUR protrusions become.red to until
ŋwʊ̀nɪ́ ˡtsʊ́w màa tsə́ áká ˡyə́ à dzɪ́m á dzɪ̀m
birds SJN.pick completely TERM egusi.seeds 6-D1 6 all 6 all
'He ate the guavas until the birds finished picking ALL the egusi.'

(b) ... *á yɪ́ʸ ŋwʊ̀nɪ́ ˡtsʊ́w màa tsə́ áká ˡyə́ à dzɪ̏m*
to until birds SJN.pick completely TERM egusi.seeds 6-D1 6 all
'... until the birds finished picking all the egusi'

2.1 Total reduplication

Total reduplication on the lexical level seems to be very restricted. It has been observed in some nouns which refer to tiny items which typically come in agglomeration or swarms (5), in ideophones (6a-b) and in adverbials (6c). Occasionally a simplex could be identified, e.g. *kə̀ɣàŋə́ɣáˡŋə́* 'worm in bowels of humans, tapeworm' is derived from *ɪ́ɣáˡŋə́* 'root, vein'; but in the majority of cases a lexical base does not seem to be in use (any more).

(5) Total reduplication in nouns

reduplicative form	gloss	probable base
kə̀-ɣàŋə́-ɣáˡŋə́	'worm in bowels of humans, tapeworm'	*ɪ́-ɣáˡŋə́* 'root, vein'
mə̀ŋ-kwàlə̀-kwàlə̏	'hook worms'	?
kə́-kpáʔá-kpáʔà	'bean seed'	?
kə́m-fɔ́ŋ-fɔ́ŋˡ	'hornet'	?
tɛ́mə̀-ntɛ̀mə̀	'middle'	*tə̀-ntɛ̀mə́* 'loose ends of a thing, e.g. fibres tied to

		a basket; extended family relations'
à-ŋgə́-ŋgə̂ŋ	'spirits, people of the other world'	?
gəbə́-gə́bə̀	'part of skin which is not completely cut off in a wound and hanging limply' (pl. *tə́-gə̀bə́gə́bə̀*)	?
kʰɪ́-kʰɪ̀	'wasp'	?
kə́-tɪ̀-tɪ́	'frame for smoking meat, grillage'	?
kə́-fú-fú	'tortoise'	?
kə́-ndzú-ndzú	'toad'	?
kwárə́-kwə̀rə̀	'mat of flexible bamboo strings'	?
kə̀-bwì-bwì	'soft thing'	*buɪ́* 'be(come) soft'

(6) Total reduplication in ideophones and adverbials

Comment: Deviant type: *ɣé-kə́-ɣé* 'empty; without defense'.

(a) *káŋ-káŋ* (ideophone for noise of ringing)

mbyɔ́ŋɪ́ *ˈfɔ́ŋ* *tsə́* *ˈkáŋkáŋ.*
bell P3.make.noise momentary <ringing.noise>
'The bell made a little sound: ring!'

(b) *ŋkwə̀ŋ-kwə̀ŋ-kwə̀ŋ* (ideophone for dazzling brightness)

kə́ *mwâ* *ŋkwə̀ŋkwə̀ŋkwə̀ŋ.*
S7 shine <very.bright>
'It is dazzling bright.'

(c) *bʌ́lə̀-bʌ̀lə̀* 'early in the morning'
lə̂m-lə̀m 'very early morning before dawn' (< *kə́-lə́m* 'darkness')
kʊ̀lɪ́-kʊ̀lɪ́ 'near'
sɪ-sɪ́ 'first' < *sɪ́* 'ahead'

2.2 High vowel reduplication *C*$_1$*ɨ*-

High vowel reduplication copies the first consonant of the root, inserting a high central vowel *ɨ* which might change to *u* in labial environment (7). Lexicalised instances of *C*$_1$*ɨ*-reduplication could also be found in nouns of other Ring languages such as Zoa (8a) and Weh (8b).

(7) Lexicalised instances of *C*$_1$*ɨ*-reduplication in nouns

reduplicative form	gloss	probable base
kə̀-tsɨ̀-tsàʔə̃̀	'rattle-like musical instrument'	*tsàʔ* 'sift'
kə́-tsɨ́-tsáʔá	'clod of soil, lump of earth, soil particle'	*ɪ́-tsáʔ* 'clay'
kə̀-bvù-bvʊ̀rì	'dust that is infested with jiggers'	*kə́-bvʊ̂* 'dust'
kə́-sú-sɔ́ʔɔ́	'termite'	?

kə́-vú-vɔ́ŋɔ́	'soldier ant'	?
kə̀-dzɪ̀-dzə̏	'fly'	?
kə́-dzɪ́-dzɪ́	'vulture'	?
kə́-bɪ́-bwáì	'water snake'	?
kə́-fú-fú	'tortoise'	?
kə́-ndzú-ndzú	'toad'	?
kə́-sɪ́-sɪ́	'sand, sandy place, heap of sand, grain of sand'	?
fú-fwé↓	'nickname for a person with one smaller leg'	*ú-fwé* 'leg'
m-gbɪ́-ŋgbáŋ	'brain'	?

(8) Lexicalised C_1i-reduplication in nouns of other Ring languages:

(a) Zoa *kə́-sɪ́-sɪ́ʔə́* 'ant (sp.)'
kə́-sɪ́-sə̂lə̀ 'whip's mark'
ǹdzɪ̀-ndzʌ̏m 'really, truly'

(b) Weh *kə́-sə́-sóʔó* 'white ant'

Some of these items could be reconstructed at the Proto West Ring level (9), possibly even beyond, but the Aghem and Kom reflexes point to the fact that a stage of total initial reduplication precedes high vowel reduplication – an observation which is taken up in (49) below.

(9) Proto West Ring **kə́-sɔ́ʔ-sɔ́ʔɔ́* > **kə́-sɪ́-sɔ́ʔɔ́* (7/8) 'termite, white ant'

Isu *kə́-sú-sɔ́ʔɔ́* (7/8) 'termite'
Weh *kə́-sə́-sóʔó* (7/8) 'white ant'
Aghem *é-sɔ́ʔɔ́-sɔ́ʔ* (5/13) 'wingless termite'
Zoa *kə́-sɪ́-sɪ́ʔə́* (7/8) 'ant (sp.)'
Kom *á-séʔ-séʔ* (7/8) 'termite'

While these nouns represent isolated lexicalised instances of high vowel reduplication, the verbal domain provides more substantial evidence for the productive application of high vowel reduplication. Thus, Isu adjectives and a subclass of verbs which denote qualities form a derived verbal adjective by prefixing the reduplicative morpheme C_1i-.[2] Its function is to indicate an increased degree of intensity of the quality encoded in the basic verb or adjective, as illustrated in the exhaustive list in (10).

[2] Actually, it is only this class of quality denoting verbs which could morphologically be defined by its capacity to derive this kind of intensive stem. Other semantic classes such as dynamic verbs of manipulation or locomotion do not accept high vowel reduplication.

(10) Formation of intensive verbal adjectives via initial high vowel reduplication *C₁i-*

Comment: [Isu4:66-69]

base	distinct IPF form	intensive verbal adjective	Structure of examples: Head noun + concordial linker + intensive adjective + concordial out-of-focus marker
nè 'big'	-	*nɪ-nè*	*fɔ̀ŋ ì nɪnè yɪ̀ỳ* 'a very big buffalo' *kâʔ fə̀ nɪ̂nê fɪ̀ỳ* 'a very big tree', *ŋkàʔ mə̀ nɪ̂nê mɪ̀ỳ* 'very big trees'
sɪ̀ə 'small'	-	*sɪ-sɪ̀ə*	*kâʔ fə̀ sɪ̂sɪ̂ə fɪ̀ỳ* 'a very small tree' *ŋkàʔ mə̀ sɪ̀sɪ̀ə mɪ̀ỳ* 'very small trees'
dàb 'long, tall'	*dàbə̀*	*dɪ̂-dábə̀*	*kâʔ fə̀ dɪ̂dáˈbə́ fíỳ* 'a very tall tree' *ŋkàʔ mə̀ dɪ̂dábə̀ mɪ̀ỳ* 'very tall trees'
tɛ́b 'small'	*tɛ́bə́*	*tɪ̂-tɛ́bə́*	*kâʔ fə̀ tɪ̂tɛ́bə́ fíỳ* 'a very short tree' *ŋkàʔ mə̀ tɪ̂tɛ́bə̀ mɪ̀ỳ* 'very short trees'
tə́b 'short'	*tə́bə́*	*tɪ̂-tə́bə́*	*kâʔ fə̀ tɪ̂tə́bə́ fíỳ* 'a very short tree' *ŋkàʔ mə̀ tɪ̂tə́bə̀ mɪ̀ỳ* 'very short trees'
dʌ̀d 'heavy'	*dʌ̀də̀*	*dɪ̂-dʌ́də̀*	*ítáì ì dɪ̂dʌ́ˈdə́ yɪ́ỳ* 'a very heavy stone' *átáì à dɪ̂dʌ́ˈdə́ yɪ́ỳ* 'very heavy stones'
zàŋ 'light'	*zàŋə̀*	*zɪ̂-záŋə̀*	*ítáì ì zɪ̂záˈŋə́ yɪ́ỳ* 'a very light stone' *átáì à zɪ̂záˈŋə́ yɪ́ỳ* 'very light stones'
táŋ 'tough'	*táŋə́*	*tɪ̂-táˈŋə́*	*ɲàm ì tɪ̂táŋə̀ yɪ̀ỳ* 'a very tough piece of meat' *ɲâm tə̀ tɪ̂táˈŋə́ tɪ́ỳ* 'very tough pieces of meat'
táo 'hard'	*túu*	*tɪ̂-táo*	*kâʔ fə̀ tɪ̂táo fíỳ* 'a very hard tree' *ŋkàʔ mə̀ tɪ̂tâo mɪ̀ỳ* 'very hard trees'
buí 'soft'	-	*bɪ̂-buí*	*kâʔ fə̀ bɪ̂buí fíỳ* 'a very soft tree' *ŋkàʔ mə̀ bɪ̂buî mɪ̀ỳ* 'very soft trees'
ɣáʔ 'fat'	*ɣáʔá*	*ɣɪ̂-ɣáʔá*	*wù ù ɣɪ̀ɣáʔà wɪ̀ỳ* 'a very fat person' *áɣê à ɣɪ̂ɣáʔá yɪ́ỳ* 'very fat people'
dɪ̀yɛ̀ 'huge'	-	*dɪ̂-dɪ́yɛ̀*	*wù ù dɪ̀dɪ̀yɛ̀ wɪ̀ỳ* 'a very tall person' *áɣê à dɪ̂dɪ́yɛ̀ yɪ̀ỳ* 'very tall people'
zʊ́m 'dry'	*zʊ́mə́*	*zɪ̂-zʊ́mə́*	*fʊ́wˈ tə̀ zɪ̂zʊ́mə́ tɪ́ỳ* 'very dry leaves' *ŋkàʔ mə̀ zɪ̂zʊ́mə̀ mɪ̀ỳ* 'very dry pieces of wood'
kài 'wet'	*kʰɪ̀i*	*kʰɪ̂-kʰɪ́ˈ*	*ndzʊ̀ ì kʰɪ̂kʰɪ̂ yɪ̀ỳ* 'a very wet piece of cloth' *ndzʊ́ tə̀ kʰɪ̂kʰɪ́ˈ tɪ́ỳ* 'very wet clothes'
dzɪ́ 'dirty'	*dzə́ə*	*dzɪ̂-dzə́ə*	*ndzʊ̀ ì dzɪ̂dzə̂ yɪ̀ỳ* 'a very dirty piece of cloth' *ndzʊ́ tə̀ dzɪ̂dzə́ tɪ́ỳ* 'very dirty clothes'
zʊ́ 'clean'	*zʊéé*	*zɪ̂-zʊéé*	*ndzʊ̀ ì zɪ̂zʊêe yɪ̀ỳ* 'a very clean piece of cloth' *ndzʊ́ tə̀ zɪ̂zʊéé tɪ́ỳ* 'very clean clothes'

Comment: Check if intensive stem is only possible in imperfective aspect and if this imperfective form is always identical to the imperfective of the simplex; check if the verbs take imperfective or pluractional infix –i-.

dzʊ̀n ‘old’	*dzʊ̀nə̀*	*dzɪ̂-dzʊ́nə́*	*ndzʊ̀ ì dzɪ̂dzʊ́nə̀ yɪ̏̀y* ‘a very old piece of cloth’ *ndzʊ́ tə̀ dzɪ̂dzʊ́nə́ tɪ́y* ‘very old clothes’
fɪ́ə ‘new’	-	*fɪ̂-fɪ́ə*	*ndzʊ̀ ì fɪ̂fɪ̂ə yɪ̏̀y* ‘a very new piece of cloth’ *ndzʊ́ tə̀ fɪ̂fɪ́ə tɪ́y* ‘very new clothes’
bàŋ ‘red’	*bàŋə̀*	*bɪ̂-bá↓ŋə́*	*ndzʊ̀ ì bɪ̂báŋə̀ yɪ̏̀y* ‘a very red piece of cloth’ *ndzʊ́ tə̀ bɪ̂bá↓ŋə́ tɪ́y* ‘very red clothes’
ləŋ́ ‘black’	*ləŋə́*	*lɪ̂-ləŋə́*	*ndzʊ̀ ì lɪ̂ləŋə̀ yɪ̏̀y* ‘a very black piece of cloth’ *ndzʊ́ tə̀ lɪ̂ləŋə́ tɪ́y* ‘very black clothes’
fʌ̀m ‘white’	*fʌ̀mə̀*	*fɪ̂-fʌ́↓mə́*	*ndzʊ̀ ì fɪ̂fʌ́mə̀ yɪ̏̀y* ‘a very black piece of cloth’ *ndzʊ́ tə̀ fɪ̂fʌ́↓mə́ tɪ́y* ‘very black clothes’
fìài ‘frightful’	*fìàa*	*fɪ̂-fɪ́↓áa*	*fɪ́ə kə̀ fɪ̂fɪ́↓áa kɪ́y* ‘a very frightful thing’ *úfɪ́ə ù fɪ̂fɪ́↓áa wɪ́y* ‘very frightful things’
dʊ̀w ‘wide’	-	*dɪ̂-dʊ́w↓*	*lɔ́↓ʔɔ́ kə̀ dɪ̂dʊ́w↓ kɪ́y* ‘a very wide place’ *úlɔ́↓ʔɔ́ ù dɪ̂dʊ́w↓ wɪ́y* ‘very wide places’
mɪ́əlɪ́ ‘deep’	*mɪ́ələ́*	*mɪ̂-mɪ́ələ́*	*tsɪ́m↓ kə̀ mɪ̂mɪ́ələ́ kɪ́y* ‘a very deep pool’ *útsɪ́m↓ ù mɪ̂mɪ́ələ́ wɪ́y* ‘very deep pools’
dzwàb ‘good’	*dzwàbə̀*	*dzɪ̂-dzwá↓bə́*	*kâʔ fə̀ dzɪ̂dzwá↓bə́ fɪ́y* ‘a very good tree’ *ŋkàʔ mə̀ dzɪ̂dzwábə̀ mɪ̏̀y* ‘very good trees’
bɛ́b ‘bad’	*bɛ́bə́*	*bɪ̂-bɛ́bə́*	*kâʔ fə̀ bɪ̂bɛ́bə́ fɪ́y* ‘a very bad tree’ *ŋkàʔ mə̀ bɪ̂bɛ́bə̀ mɪ̏̀y* ‘very bad trees’

Morphosyntactically, these reduplicative intensive forms are hybrids between noun and verb and should best be called participles or verbal adjectives. They are either based on adjectives such as *nè* ‘big’ or in the majority of cases on imperfective verb forms such as *dàbə̀* ‘become long, become tall’ and share with verbs their morphotonological properties. On the other hand, they lack crucial verbal characteristics: they cannot be inflected for aspect and they cannot be used as main verbs in a matrix clause, instead they only occur in the above attributive construction which resembles a subject relative clause or in nominal predication such as (11). For an equivalent in independent clauses, the simplex is used in combination with the intensifier preverb *`ŋgé* ‘very’ (12).

(11) Intensification in nominal predication by reduplicative participle

kâʔ	*f-ə̀*	*də̌*	*fə̀*	*dɪ̂dá↓bə́*	*f-ɪ́y*
tree	19-D1	COP	19	very.long	19-OF

‘This tree is a very tall one.’

(12) Intensification of verbal predication by *`ŋgé* ‘very’

(a) *kâʔ f-ə̀ ŋgə̌ dàb-ə̀ ŋwə̏*
tree 19-D1 very be.long-IPF CF
'This tree is very tall.'

(b) *kâʔ f-ə̀ mə́ ˡŋgé dàb*
tree 19-D1 P0.F very be.long
'This tree has become very tall.'

While these intensive adjectives serve as a base to derive class 7 nouns of abstract qualities (13), there are also cases where the intensive reduplication seems to build directly on a nominal root, e.g. in derivation of *kə́ndɪ́ndáŋ* from the noun of quality *kə́ndáŋ* 'long thing, tall one' (14).

(13) Nouns derived from intensive adjectivals

ɣáʔ 'become fat': *ɣɪ̂ɣáʔá* 'very fat': *kə́ɣɪ̂ɣàʔ, kə̀ɣɪ̀ɣàʔ* 'very fat thing'
ɣɪ̀ɣàʔ kə́ wû 'a very fat person'

dàb 'become long': *dɪ̂dáˡbə́* 'very long': *kə́dɪ̂dàb* 'very long thing'
kâʔ fə̀ də̌ fə̀ dɪ̂dáˡbə́ fíý 'this tree is a very tall one'
ɪ́sɔ́ŋˡ ì dɪ̂dáˡbə́ yɪ́ý, dɪ̀dàb kɪ́ɪsɔ̀ŋ 'a very long tooth'

dzwàb 'be good': *dzɪ̂dzwáˡbə́* 'very good': *kə̀dzɪ̀dzwàb, kə́dzɪ̂dzwàb* 'very good thing'
ù kʰú dzɪ̀dzwàb kə́ úmwàm 'he has very good manners'
dzɪ̀dzwàb kə́ fə́kàʔ 'a very good tree'

bɛ́b 'be bad': *bɪ̂bɛ́bə́* 'very bad': *kə́bɪ́bɛ́b* 'very bad thing'
ù kʰú ˡbɪ́bɛ́b kə́ úmwàm 'he has very bad manners'

buɪ́ 'become soft': *bɪ̂buɪ́* 'very soft': *kə̀bwɪ̀bwɪ̀* 'soft thing'
ù kʰú bwɪ̀bwɪ̀ kə́ úwɛ̀ 'he has a soft body'

ŋgé 'much, excessively': *kə́ŋgɪ́ŋgé* 'excess, abundance'

Comment: check: *ŋgɪ́ŋgé* 'xxx'

ɣú ɲɪ̂ə ŋgɪ́ŋgé kə́ məŋˡkʰwʊ́ʔɪ́ áwɔ̀ ɪpfɔ́ y-ɪ́ý
S3pl give excess 7 respect to death 5-OF
'They give / pay very much respect to death.'

(14) Intensive denominal derivation

ndɪ́ndáŋ kə́ dzʌ́tˡ 'a very distant road = the long way round, i.e. a road which is longer than others leading to the same destination'

The importance of the attestation of this type of high vowel reduplication in Isu resides in two facts: first, it links Isu and probably other Ring languages of the Grassfields to West African Benue-Congo and Kwa languages in general where high

vowel reduplication has been found an ubiquitous feature. Second, it provides the key to the historical explanation of another phenomenon in Isu (and other closely related Ring languages such as Zoa) which would seem odd otherwise: a palatal infix for imperfective function. It is exactly the intensive function of Isu high vowel reduplication observed in (10, 12-14) which establishes a link to this infix marker *-i-* via external parallels in a cognate strategy of South Ring Babungo discussed below in (35-36).

2.3 High vowel reduplication and its reflexes in verbal derivation and inflection

Given the fact that reduplication is such a paramount feature in many West African languages, one may ask why it seems to be restricted to these relatively isolated usages in Isu. The answer is that results of prior processes of vital reduplication have been obliterated in Isu on a broad scale by a process of haplological reduction, leaving as its terminal trace a palatal infix *–i-* which covers a variety of related meanings in modern Isu, namely causative, pluractional and imperfective (Kießling 2004, 2006). In all three functions the palatal infix is inserted immediately after the initial consonant of the verbal root and combines with an aspectual suffix *–i* (perfective) vs. *-ə* (imperfective). This section describes the semantics and the morphophonemics of this infix and assembles internal as well as external evidence of its origin in a high vowel reduplication C_1i- which was reduced along the lines of haplology combined with reanalysis of morphological boundaries.

2.3.1 Palatal infix for causative and pluractional function

The palatal infix for causative function is marginal and largely restricted to quality verbs, most of them listed in (15), and to some motion verbs which allow for an assistive or adiuvative causative. Many verbs do not form a distinct causative stem, since they are characterized by dual transitivity, i.e. they unite transitive and intransitive reading, e.g. *dzwʊ̀ʔì* ‘become loose; make loose, loosen’. Most other verbs have the capacity to form a syntactic causative by paraphrase with *zɨ́ŋɪ́* ‘do, make’. This suggests that the infix for causative function is in the process of fading out – which is important to note as terminal stage of reduction which started from initial high vowel reduplication.

(15) Causative formation by palatal infix plus suffix[3]

simplex	causative perfective	causative imperfective	gloss
bàŋ	*biàŋì*	*biàŋə̀*	'be red' : 'redden'
bɛ́b	*biɛ́bɪ́*	*biɛ́bə́*	'be bad' : 'spoil'
dàb	*diàbì*	*diàbə̀*	'be long' : 'lengthen'
dàŋ	*diàŋì*	*diàŋə̀*	'cross, traverse' : 'make cross, assist to traverse'
fə̀m	*fiəmì [fyìmì]*	*fyìmə̀*	'be white' : 'whiten'
fə́m	*fiəmí [fyímí]*	*fyímə́*	'suffer' : 'vex, molest, disturb'
ləŋ	*liəŋí [lyíŋí]*	*lyíŋə́*	'be black' : 'blacken'
tə́b	*tiəbí [tyíbí]*	*tyíbə́*	'be short' : 'shorten'
tsɛ́m	*tsəɛ́mí*	*tsəɛ́mə́*	'drop' : 'let drop'

Still more productive than the causative is the pluractional function of the infix as shown in (16). The label „pluractional" here subsumes at least six overlapping meanings exemplified in (17): patient plurality, resultative plurality, repetition, continuation, intensity and totality.

(16) Pluractional formation by palatal infix plus suffix[4]

simplex	pluractional, perfective	pluractional, imperfective	gloss
bʌ́b	*biəbí [byíbí]*	*biəbə́*	'ask' : 'ask repeatedly'
bʌ̀d	*biəlì [byìlì]*	*biələ̀*	'tear' : 'tear many items'
bə̀m	*biəmì [byìmì]*	*biəmə̀*	'mould' : 'mould completely'
bɔ́ŋ	*biɔ́ŋí*	*biɔ́ŋə́*	'pick up (once)' : 'pick up repeatedly'
dàŋ	*diàŋì*	*diàŋə̀*	'cross, traverse' : 'cross in a multiple fashion (e.g. like a spider)'
fáŋ	*fiáŋí*	*fiáŋə́*	'cross (arms, fingers), make immobile' : 'tie, entangle, become entangled'
fɛ́b	*fiɛ́bí*	*fiɛ́bə́*	'blow out air, puff out once' : 'puff out air several times, in several puffs, blow out air constantly, e.g. of wind; winnow'
kàb	*kiàbì*	*kiàbə̀*	'scratch' : 'scratch repeatedly'

[3] Apart from the infix strategy, some verbs derive a causative by taking the suffix *–i* (for perfective) vs. *–ə* (for imperfective), e.g. *kùm* 'arrive, reach', *ŋúŋ* 'suck' and *twáb* 'be sharp, be sweet' derive *kùmì* / *kùmə̀* 'bring', *ŋúŋí* / *ŋúŋə́* 'beastfeed' and *twábí* / *twábə́* 'sharpen', respectively. Other verbs operate an internal vowel change, e.g. *ŋə̀m* 'be hot' derives the causative *ŋù[u]mì* 'heat up').

[4] Most revealingly, some verbs with inherent semantic plurality present a palatal element immediately after the initial consonant, probably reflecting a fossilised instance of the palatal infix, e.g. in *kyɪ́lɪ́* 'rub', *tiàŋì* 'stumble', *liáʔɪ́* 'shatter'.

kɛ́m	*kiɛ́mɪ́*	*kiɛ́mə́*	‘break in two parts’ : ‘break in several parts’
mɔ̀ʔ	*miɔ̀ʔɪ̀*	*miɔ̀ʔɔ̀*	‘imitate’ : ‘imitate repeatedly’
táŋ	*tiáŋɪ́*	*tiáŋə́*	‘count, enumerate, declare’ : ‘count several times’
tə́m	*tiə́mɪ́ [tyɪ́mɪ́]*	*tiə́mə́ [tyɪ́mə́]*	‘dig; shoot; weave’ : ‘dig, shoot repeatedly’
tə́ŋ, tɪ́ŋ	*tiə́ŋɪ́ [tyɪ́ŋɪ́]*	*tiə́ŋə́ [tyɪ́ŋə́]*	‘push’ : ‘push repeatedly’

(17) Readings of the pluractional form

(a) patient plurality, i.e. multiple patients undergo the process encoded in the verb, e.g. *fáŋ* ‘cross two fingers, hands, arms’ vs. *fiáŋɪ́* ‘tie, clench’

mə́ kɪ̂ fáŋ-ə́ ŋwɔ̀ wɔ́ k-ɪ́y ‘I will cross two fingers.’
S1sg FUT1 cross-IPF CF hand 7-OF

mə́ kɪ̂ fiáŋ-ə́ ŋwɔ̌ ˡŋgwɔ́ʔ
S1sg FUT1 cross.PLUR-IPF CF fist
‘I will fold all my fingers, clenching a fist.’

(b) resultative plurality, i.e. the action results in a multiple patient, e.g. *kɛ́m* ‘break in two parts’ vs. *kiɛ́mɪ́* ‘break in several parts’

dzáŋ káa-ŋwà kə̀ mə́ ˡkiɛ́mɪ́
stalk 7.7-writing S7 P0.F break.PLUR.PF
‘The pen is broken in several pieces.’

ɪ́dzʊɔ́ ɪ́ ntwàa ɪ́ kiɛ́mɪ́ dɔ̀ʔɔ̀ ŋwɔ̃̀
mouth 5 pot S5 break.PL.PF stay CF
‘The mouth of the pot is broken in several places.’

(c) repetitive / iterative, i.e. the action is repeated several times on the same patient, e.g. *tə́ŋ* ‘push’ vs. *tyɪ́ŋɪ́* ‘push repeatedly’

mə́ mə́ ˡtyɪ́ŋɪ́ wɛ́
S1sg P1.F push.PLUR.PF O3sg
‘I have been pushing him repeatedly.’, ‘I have kept pushing him continuously.’, ‘I have forced him.’

(d) continuative; i.e. the action or event continues for some time, e.g. *tə́ŋ* ‘push’ vs. *tyɪ́ŋɪ́* ‘keep pushing’

mə́ kɪ̂ tyə́ŋə́ ŋwɔ̌ wɛ̀
S1sg FUT1 push.PLUR.IPF CF O3sg
‘I will keep pushing him continuously.’, ‘I will be pushing him repeatedly.’, ‘I will force him.’

(e) intensive, i.e. the event or action is carried out with a lot of energy and concentration for a certain duration (implying repetition) and has an extreme result, e.g. *bwɔ́ʔ* 'sound, ring' (simplex) vs. *bvúʔɪ́* 'shout' (pluractional)

mə́	*kɪ̂*	*bwɔ́ʔɔ́*	*ŋwɔ̋*	'I will ring.'
S1sg	FUT1	sound.IPF	CF	
mə́	*bvɔ́ʔɔ́*		*məmbɔ̋ŋ*	'I am shouting.'
S1sg	sound.PLUR.IPF		6ab.cries	

(f) totality, i.e. the patient is completely affected by the process encoded in the verb, e.g. *bə̀m* 'mould' vs. *byìmì* 'mould completely'

tə́m	*k-ə́*	*mə́*	*byìmì*	'The fruit has moulded completely.'
fruit	7-OF	P0.F	mould.PLUR.PF	

There is sporadic evidence that both strategies, suffixation of *–i* and infixation of *–i-*, operate independently of each other. For instance, the verb root *lə̀m* 'emit a (mostly unpleasant) smell' in (18) derives a causative *lə̀mì* 'sniff, take in a smell' by attaching the suffix *–i* without accompanying internal palatalisation. Combined suffixation of *–i* and infixation of *–i-* is used to derive a pluractional causative *lìəmì* 'sniff continuously'. Two different forms with slightly different meanings compete for the non-causative imperfective: *lə̀mə̀* 'emit an unpleasant smell', formed by the regular imperfective suffix *-ə* vs. *lìəmə̀* 'emit a pleasant smell' combining the palatal infix with the regular imperfective suffix *-ə*, formally identical to the causative imperfective and the pluractional imperfective. It seems as if the second form *lìəmə̀* represents an incomplete backformation from the causative (or pluractional form), replacing the causative suffix *–i* by the imperfective suffix *-ə*, but leaving the palatal infix for causative or pluractional function untouched. This might have been semantically motivated by the fact that it is only with pleasant odours that one is inclined to take in a sniff by conscious and repeated efforts.

(18) Causative, pluractional and imperfective formation with *lə̀m* 'emit a smell'

	perfective	imperfective	pluractional perfective	pluractional imperfective
simplex 'emit a smell'	*lə̀m*	*lə̀mə̀, lìəmə̀*	?	*lìəmə̀*
causative 'sniff, take in a smell'	*lə̀mì*	*lìəmə̀*	*lìəmì*	*lìəmə̀*

2.3.2 Palatal infix for imperfective function

The palatal infix *–i-* is in a quasi-complementary distribution with a couple of other strategies such as suffixation of *–ə* and various types of vowel alternation all of which serve the function to derive an imperfective verb stem. The distribution of these strategies is to a large extent conditioned by the structure of the perfective base, as outlined in table (22). In this way, verbal stems such as *bɔ̀ʔɔ̀* 'take, carry', *nù* 'hide', *ná* 'keep, store', *bɛ́mə́* 'agree', *mwàmì* 'taste, try' and *màʔà* 'throw' in (19a, 20a, 21a) derive the imperfective stems *biɔ̀ʔɔ̀*, *nèe*, *niá*, *biɛ́mə́*, *mwàmə̀* and *miàʔà* in (19b, 20b, 21b), respectively.

(19) Palatal infix for the imperfective aspect *–i-*: *bɔ̀ʔɔ̀* (PF) vs. *biɔ̀ʔɔ̀* (IPF) 'take, carry', *ná* (PF) vs. *niá* (IPF) 'keep, store'

(a) *ɣú mə́ bɔ̀ʔɔ̀ nù ná úkʰɪ́ w-ɪ́y*
3pl P0.F carry hide keep money 3-OF
'They have taken and hidden the money.'

(b) *ɣú kî biɔ̀ʔɔ̀ nèe niá ŋwɔ̀ ùkʰɪ́ w-ɪ́y*
3pl FUT1 carry:IPF hide:IPF keep:IPF CF money 3-OF
'They will take and hide the money.'

(20) Palatal infix for the imperfective aspect *–i-*: *bɛ́mə́* (PF) vs. *biɛ́mə́* (IPF) 'agree'

(a) *mə́ mâŋ mwàmì bɛ́mə́ sɔ̀ʔɔ̀ ŋwɔ̃̀*
1sg only try agree also CF
'I agree only hesitantly."

(b) *mə́ kî màaŋə̀ mwàamə̀ biɛ́mə́ sɔ̀ʔɔ̀ ŋwɔ̃̀*
1sg FUT1 only:IPF try:IPF agree:IPF also CF
'I will agree only hesitantly.'

(21) Palatal infix for the imperfective aspect *–i-*: *màʔà* (PF) vs. *miàʔà* (IPF) 'throw'

(a) *mə́ mə́ màʔà ɪ̀táɪ́́ y-iy*
1sg P0.F throw stone 5-OF
'I have thrown a stone.'

(b) *mə́ ɲîə miàʔà yə̀ ɪ̀táɪ́́*
1sg now throw:IPF CFG stone
'I am throwing a stone.'

(22) Distribution of imperfective marking strategies according to the verbal structure[5]

	Structure of the perfective base	imperfective strategy
A	*CVC*	*CVC-ə*
B	*CVCi*	*C-i-VC-ə*
C1	*CVCə*	*C-i-VCə*
C2	$CV_1ʔV_1$	$C\text{-}i\text{-}V_1ʔV_1$
D1	*CiVCV, CyiCV*	*CiVC-ə, CyiC-ə*
D2	*{tw, dw, sw, zw}VCi*	*{tw, dw, sw, zw}VC-ə*
D3	*{ts, dz, bv, pf}VCi*	*{ts, dz, bv, pf}VC-ə*
E1	*Ca* *Cɛ* *Cə*	*C-i-a-a, C-ə-a-a* *C-i-sɛ-ɛ* *C-i-ə-ə*
E2	*CV (V = a, ɛ, e, i, ə, ɨ, ɔ)*	*CV-V*
E3	*Cʊ*	*C[w]-ʊɔ*
E4	*Cu*	*Cw-ee*
F1	*Cai*	*Ca-a*
F2	*Cai*	*Ci-i*
F3	*Cau*	*Cu-u*
G	*Ci, Ciy, Ciə*	*Ci-aʔa*
H	*CVw, CVy, CVV, CwV*	= PF

While imperfective formation of monoradical roots (types E-H) seems to be very idiosyncratic indeed, diradical roots (types A-D) reveal a quasi-complementary distribution of the principal strategies of imperfective formation, i.e. infixation of *–i-* and suffixation of *-ə*. The palatal infix is blocked as an imperfective marker, as soon as the initial consonant in a diradical base is either palatalised (type D1), labialised (type D2) or affricate (type D3). In these cases the suffix *-ə* is the only option for the imperfective. However, this suffix is blocked, as soon as the diradical base terminates in schwa (C1) or echo-vowel (type C2), and the only option for the imperfective is the palatal infix. Only verb types A and B allow for a combination of palatal infix and schwa suffix. For verbs of type A it is clear that the suffix *-ə* forms the imperfective, while the palatal infix derives a pluractional stem, resulting in systematic morphological quadruples (23). For verbs of type B (24) which apply infixation of *-i-* and suffixation of *-ə* simultaneously, it is not clear if there is a systematic distinction of pluractional and imperfective or whether there is polysemy of one form uniting pluractional and imperfective reading.

[5] Since a detailed overview plus morphophonological analysis of all the strategies involved in the imperfective formation is contained in Kießling 2006, only those dimensions are taken up here which relate to the palatal infix and provide evidence of its origin in a high vowel reduplication.

(23) *CVC* (type A): combined imperfective suffix *-ə* and pluractional infix *–i-*

simplex	imperfective	pluractional, perfective	pluractional, imperfective	gloss
bʌ́b	*bʌ́bə́*	*biə́bɪ́ [byɪ́bɪ́]*	*biə́bə́*	‘ask’
bʌ̀d	*bʌ̀də̀*	*biə̀lì [byìlì]*	*biə̀lə̀*	‘tear’
bə̀m	*bə̀mə̀*	*biə̀mì [byìmì]*	*biə̀mə̀*	‘mould’
bɔ́ŋ	*bɔ́ŋə́*	*biɔ́ŋɪ́*	*biɔ́ŋə́*	‘pick up’
dàŋ	*dàŋə̀*	*diàŋì*	*diàŋə̀*	‘cross, traverse’
fáŋ	*fáŋə́*	*fiáŋɪ́*	*fiáŋə́*	‘cross (arms, fingers)’
fɛ́b	*fɛ́bə́*	*fiɛ́bɪ́*	*fiɛ́bə́*	‘blow out air’
kàb	*kàbə̀*	*kiàbì*	*kiàbə̀*	‘scratch’
kɛ́m	*kɛ́mə́*	*kiɛ́mɪ́*	*kiɛ́mə́*	‘break’
mɔ̀ʔ	*mɔ̀ʔɔ̀*	*miɔ̀ʔì*	*miɔ̀ʔɔ̀*	‘imitate’
taŋ	*taŋə́*	*tiaŋɪ́*	*tiaŋə́*	‘count, enumerate, declare’
tə́m	*tə́mə́*	*tiə́mɪ́ [tyɪ́mɪ́]*	*tiə́mə́ [tyɪ́mə́]*	‘dig; shoot; weave’
tə́ŋ, tɪ́ŋ	*tə́ŋə́*	*tiə́ŋɪ́ [tyɪ́ŋɪ́]*	*tiə́ŋə́ [tyɪ́ŋə́]*	‘push’

(24) *CVCi* (type B): combined imperfective infix *–i-*and suffix *-ə* replacing perfective ending *i*

perfective	imperfective	gloss
bə̀lì	*biə̀lə̀*	‘answer’
kaŋɪ́	*kiaŋə́*	‘fry’
kɔ́ŋɔ́	*kiɔ́ŋə́ [kiɔ́ŋɔ́]*	‘move across level ground’
nə̀ŋì	*niə̀ŋə̀*	‘lie down’
tàŋì	*tiàŋə̀, [tiàŋà]*	‘sew’
tə́mɪ́	*tiə́mə́ [tyɪ́mə́]*	‘stand, stop’

Verbs of type C (25) end in schwa or in an echo-vowel in their perfective base and form the imperfective by the palatal infix. The echo-vowel is the regular result of a total progressive transglottal assimilation of schwa, as testified by productive imperfectives of type A with terminal glottal stop in (26).

(25) *CVCə* (type C1)*, $CV_1ʔV_1$* (type C2): imperfective infix *-i-*

perfective	imperfective	gloss
bɛ́mə́	*biɛ́mə́*	‘agree’
bɔ̀ʔɔ̀	*biɔ̀ʔɔ̀*	‘carry load on shoulder or head’
dɔ̀ʔɔ̀	*diɔ̀ʔɔ̀*	‘sit down’
mʌ́lə́	*miə́lə́*	‘sink, drown, submerge’
lə́mə́	*liə́mə́*	‘wait’

mà?à	*mià?à*	‘throw’

(26) Transglottal assimilation of the imperfective suffix *-ə* to the quality of the root vowel[6]

perfective	imperfective	gloss
bà?	*bà?à*	‘herd’
bwɔ̀?	*bwɔ̀?ɔ̀*	‘drill’
bwɔ́?	*bwɔ́?ɔ́*	‘sound’
fà?	*fà?à*	‘work’
fɔ̀?	*fɔ̀?ɔ̀*	‘measure, imitate’
kɔ̀?	*kɔ̀?ɔ̀*	‘see’
tsɔ́?	*tsɔ́?ɔ́*	‘laugh’
tsʊɔ̀?	*tsʊɔ̀?ɔ̀*	‘rinse’

In type D1 (27) the imperfective suffix *-ə* replaces the final vowel *i* of the perfective. The palatal infix cannot be applied, since the base already contains *i* or a palatalised consonant in the crucial position immediately following the initial consonant.

(27) *CiVCV, CyiCV* (D1): imperfective suffix *-ə* replaces final vowel *i*, infix *–i-* blocked

perfective	imperfective	gloss
biə̀lì	*biə̀lə̀*	‘tear many things’
biɛ́bɪ́, biə́bɪ́	*biɛ́bə́ [biə́bə́]*	‘spoil, destroy’
kyɪ́lɪ́	*kyɪ́lə́*	‘rub’
tiə̀ŋì	*tiə̀ŋə̀*	‘stumble’
liá?ɪ́	*liá?á (< *liá?-ə)*	‘shatter’

As soon as the initial consonant is labialised (type D2 in 28) or affricate (type D3 in 29), the palatal infix is blocked again and suffix *-ə* must be chosen to form the imperfective.

(28) *{tw, dw, sw, zw}VCi* (D2): imperfective suffix *-ə* replaces final vowel *i*, infix *–i-* blocked

perfective	imperfective	gloss
twúmɪ́	*twúmə́*	‘reject’
dʊ́?ɪ́	*dwɔ́?ɔ́*	‘rejoice, be happy’

[6] In these imperfectives, the terminal vowel is strikingly restricted to the qualities *a* and *ɔ*. This is probably due to a series of root-internal assimilations in the environment of the glottal stop, see (42-48) below.

swɔ̀ʔì	*swɔ̀ʔɔ̀*	‘tease’
twʊ̀ʔì	*twɔ̀ʔɔ̀ [twʊ̀ʔə̀, twɔ̀ʔə̀]*	‘take good care’
zʊ̀ʔì	*zwɔ̀ʔɔ̀*	‘press, squeeze’

(29) *{ts, dz, bv, pf}VCi* (D3): imperfective suffix *-ə* replaces final vowel *i*, infix *–i-* blocked

perfective	imperfective	gloss
dzɔ́ŋɪ́	*dzɔ́ŋə́ [dzɔ́ŋɔ́]*	‘return’
tsəɛ́mɪ́	*tsəɛ́mə́*	‘drop’
bvʊ́ʔɪ́	*bvɔ́ʔɔ́*	‘call’
dzʊ̀ʔì	*dzwɔ̀ʔɔ̀*	‘get loose’

A comparison of the verbal base forms in types D1, D2 and D3 in (27-29) reveals that they are all characterised by complex onsets, the complexity either resulting from palatalisation (27), labialisation (28) or affrication (29). It seems likely that these bases refuse imperfective formation by infixation exactly because their onset types represent the fusion of a simpler root initial consonant with a productive or a fossilised (palatal) infix, as indicated in table (30). The verb stems *biɛ́bɪ́* ‘spoil’ and *tsəɛ́mɪ́* ‘let drop’, for instance, are causatives, transparently derived from *bɛ́b* ‘become bad’ and *tsɛ́m* ‘drop, trickle’, respectively; *biə̀lì* ‘tear many things’ and *bvʊ́ʔɪ́* ‘call’ can be recognised as pluractionals of *bʌ̀d* ‘tear, split’ and *bwɔ́ʔ* ‘sound’, respectively. In analogy to these instances of a productive derivation by way of infixation of *–i-*, verbs such as *liáʔɪ́* ‘shatter’ and *kyɪ́lɪ́* ‘rub’, by virtue of their pluractional meaning, might be analysed as fossilised pluractionals, derived from *kʌ́d* ‘cover’ and a non-existent verbal base to be inernally reconstructed as **láʔ*.

(30) Presence of pluractional or causative infix *-i-* blocks imperfective formation by infix *-i-*

perfective	imperfective	gloss	base
biɛ́bɪ́	*biɛ́bə́*	‘spoil, destroy’	causative < *bɛ́b* ‘become bad’
biə̀lì	*biə̀lə̀*	‘tear many things’	pluractional < *bʌ̀d* ‘tear, split’
tsəɛ́mɪ́	*tsəɛ́mə́*	‘let drop’	causative < *tsɛ́m* ‘drop, trickle’
bvʊ́ʔɪ́	*bvɔ́ʔɔ́*	‘call’	pluractional < *bwɔ́ʔ* ‘sound’
kyɪ́lɪ́	*kyɪ́lə́*	‘rub’	pluractional < *kʌ́d* ‘cover’
tiàŋì	*tiàŋə̀*	‘stumble’	?pluractional < **tàŋ* ?
liáʔɪ́	*liáʔá*	‘shatter’	?pluractional < *láʔ* ?

The fact that the imperfective infix *–i-* does not combine with labialised onsets *tw*, *dw*, *sw*, *zw* and affricate onsets *ts*, *dz*, *bv*, *pf* raises the suspicion that both labialisation and affrication originate in infixation, probably representing an

advanced stage of phonological reduction of the infix. Direct synchronic evidence for this hypothesis is provided by the fact that the plosive *b* in simplex *bwɔ́ʔ* 'sound' is replaced by its affricate counterpart *bv* in the pluractional *bvʊ́ʔɪ́* 'call', an instance of initial consonant mutation where the affricate takes the functional role of a palatalised variant of *b*, discussed in (37-41) below.[7]

In both causative and imperfective function, the palatal infix tends to be lost in the environment of acute sound qualities: as soon as coronal consonants such as *t*, *d*, *s*, *z*, *n* precede and front or central non-low vowels such as *ɛ*, *i*, *ə*, *ɨ* immediately follow, the palatal infix tends to undergo lowering and centralisation, attested in the causative *tsəɛ́mɪ́* 'let drop' (< **tsiɛ́mɪ́*) and the imperfective *zəɛ̀mə̀* 'awaken, wake up someone' (< *ziɛ̀mə̀*) in (31). The resulting schwa may then either assimilate completely to the root vowel, as in the imperfective *nɛ́ɛmə́* 'grow up' (< *niɛ́mə́*), or it may cause a lengthening in the friction phase of the preceeding fricative or affricate, attested in the variants *tssɛ́mɪ́* and *zzɛ̀mə̀*. Occasionally, predecessor forms such as *ziɛ̀mə̀* and *niɛ́mə́* continue as rare archaic variants.

(31) Reduction of the palatal infix in acute environment (sibilants, coronals, front vowels)

(a) *tsɛ́m* 'drop, trickle'
causative: **tsiɛ́mɪ́* 'let drop' > *tsəɛ́mɪ́* (lowering & centralisation) > *tssɛ́mɪ́* (compensatory sibilant lengthening)

(b) *nɛ́mə́* 'grow up'
imperfective: *niɛ́mə́* > *nəɛ́mə́* (lowering & centralisation) > *nɛ́ɛmə́* (total assimilation: compensatory vowel lengthening)

(c) *zɛ̀m* 'wake up' : *zəɛ̀mə̀* 'awaken, wake up someone'
imperfective: *ziɛ̀mə̀* > *zəɛ̀mə̀* (lowering & centralisation) > *zzɛ̀mə̀* (compensatory sibilant lengthening)

The diversity of imperfective forms presents the image of functional syncretism of previously distinct morphological strategies. In general, two distinct markers converge in imperfective function: the infixation of *–i-* and the suffixation of *-ə* which surfaces in many allomorphs, most of which derived by partial or total assimilation to the root vowel.

[7] The aspectually determined alternation of root vowel *ʊ* (perfective) vs. *ɔ* (imperfective) is discussed in (42-48).

2.3.3 Diachronic analysis of the palatal infix

The palatal infix *–i-* in Isu probably evolved from a prior reduplicative prefix * C_1i- with progressive function, i.e. a prefix which reduplicates the initial consonant of the root inserting a high front vowel between the original and its copy. This type of strategy, known as high vowel reduplication, is widely attested in Kwa and Benue-Congo languages in various functions (Faraclas & Williamson 1984: 2), e.g. in Akan (Schachter & Fromkin 1968: 155-177), Fongbe (Lefebvre & Brousseau 2002: 195-216), Yoruba (Awobuluyi 1982: 93, Bamgbose 1974: 9, Ward 1952: 70-72), Igbo (Anyanwu 1998: 62-3) and in Central Nigerian Plateau, e.g. in Kwoi (Gerhardt 1988), where it has repetitive function in the verbal domain and distributive plural function in the nominal domain. It also occurs in the wide Grassfields, e.g. in Ghomala' (32a) and Fe'fe' (32b), and in Northwestern Bantu, e.g. Ewondo (32c).

(32) High vowel reduplication in Grassfields and North Western Bantu languages

(a) Ghomala' (Nissim 1975: 158f., Nissim 1981: 262-3, 294)
saʔ 'juger' : *n-sɯ̂-saʔ* 'à juger ou jugé'
sɔ̀h 'laver' : *n-sɯ̂-sɔ̀h* 'lavé ou à laver'

(b) Fe'fe' (Hyman 1972: 95-126)
za 'eat' : *zɯ-za* 'eadible; do nothing but eating'
to 'punch' : *tɯ-to* 'do nothing but punching'

(c) Ewondo (Redden 1979: 17f.; Essono 2000: 282)
dɪ́g 'burn' : *i-dɪ́-dig-a* 'burnt' (qualificative adjective)
bú́g 'break, shatter' : *e-bú́-bug-a* 'broken, shattered' (qualificative adjective)
wɔŋ 'fear' : *ǹ-wú́-wɔ́ŋ* 'fearful person' (qualificative noun)
ŋ́-koe 'bachelor' : *ŋ̀-ku-koe* 'confirmed bachelor' (intensification)
dɪ́ 'eat' : *i-dɪ́-dɪ́-i* 'completely eaten up (e.g. by a moth)' (totality)
dɪ́ŋ 'love' : *i-dɪ́ɪ́-diŋ-i* 'uncontrolled love' (excessive)

Table (33) details the steps by which the infix might have developped from initial high vowel reduplication, relevant changes highlighted by bold. First, a perfective base such as *bɔ̀ʔɔ̀* 'carry, take' derives an imperfective stem by reduplicating the initial consonant *b* and inserting a front high vowel *i*, resulting in the form *b_1i-b_2ɔ̀ʔɔ̀ (33a). Haplological reduction (33b) deletes the root initial consonant, i.e. the original. As a consequence the remaining reduplicated consonant which is part of the prefix is reanalysed as part of the root vis-à-vis the perfective base. This process finally turns the high front vowel of the prior prefix into an infix (33c). Thus, the palatal infix originates in the haplologically motivated reduction of the reduplicated verb form

combined with a paradigmatically conditioned reanalysis of morphological boundaries.

(33) Infix genesis via haplologically motivated reduction of the reduplicated verb form

perfective stem: *bɔ̀ʔɔ̀* 'carry, take'	pattern	example
(a) imperfective formation via *C_1i-	*$\boldsymbol{C_1i}$-C_1VC_2V	*$\boldsymbol{b_1i}$-b_2ɔ̀ʔɔ̀
(b) haplologically motivated deletion of C_2 in the root	*C_1i-$\boldsymbol{\varnothing}VC_2V$	*b_1i-$\boldsymbol{\varnothing}$ɔ̀ʔɔ̀
(c) paradigmatic reanalysis of the reduplicated initial as part of the root	$C_1\boldsymbol{i}VC_2V$	$b_1\boldsymbol{i}$ɔ̀ʔɔ̀

Even though stage (33a) is not attested synchronically, this process of infix genesis could be inferred on the basis of two general observations – its typological plausibility and the attestation of its predecessor form in the macro-area in semantically related functions – and two Ring specific details: (i) cognates of the reduplicated form are attested in other Ring languages, (ii) the internal reconstruction of the high vowel in the reduplicated prefix helps to explain further morphophonological peculiarities of imperfective formation such as initial consonant mutations and internal vowel changes.

2.3.3.1 Typological plausibility

Far from being unique in Africa, this type of infix genesis is attested in Cushitic languages. The Southern Cushitic language Alagwa (Tanzania) employs a reduplicative suffix -aC_z for progressive function. In the course of haplologically motivated reduction and paradigmatically conditioned reanalysis of morpheme boundaries, the vowel of the suffix slips into the root, merging with the root vowel and creating an infix *–aa-* (Kießling 2003: 114ff.).

(34) Alagwa: genesis of an infix *–aa-* via haplological reduction of a reduplicative suffix -aC_z

Verbal bases *ʔar* 'see', *kwaħ* 'throw'	pattern	*ʔar* 'see'	*kwaħ* 'throw'
(a) progressive derivation via suffix –aC_z (combined with the durative suffix *–im*)	*C_1aC_z-$\boldsymbol{aC_z}$-*im*	*ʔar*$_1$-$\boldsymbol{ar_2}$-*im*	*kwaħ*$_1$-$\boldsymbol{aħ_2}$-*am*
(b) haplologically motivated deletion of C_1 in the root	*$C_1a\boldsymbol{\varnothing}$-$aC_z$-*im*	*ʔa*$\boldsymbol{\varnothing}$-*ar*$_2$-*im*	*kwa*$\boldsymbol{\varnothing}$-*aħ*$_2$-*am*
(c) paradigmatic reanalysis of the reduplicated C_2 as part of the root	*C_1-aa-C_z-*im*	*ʔ-aa-r-im*	*kw-aa-ħ-am*

In principle, the Alagwa and the Ring instances of infix genesis are parallel with respect to both the reduplicative input form and the mechanisms and motivations of

reduction. The only difference is that the Alagwa infix originates in a reduplicative suffix *-aC$_z$*, in harmony with the predominantly suffixing character of this Southern Cushitic language, whereas the Isu infix originates in a prefix *C$_1$i-*.

2.3.3.2 Ring-internal evidence of high vowel reduplication *C$_1$i-*

Initial reduplication involving a central high vowel is attested in another Ring language, namely in *Vəŋo* a.k.a. Babungo (South Ring), where it serves two distinct functions (Schaub 1985: 217f., 353ff.): deriving a progressive form from dynamic verbs (35) and an intensive form from stative verbs (Schaub 1985: 218, 255) in (36). On the one hand, this second semantic notion clearly links the Babungo high vowel reduplication with the synchronically productive Isu high vowel reduplication in intensive function illustrated in (10) above. On the other hand, the double function of the Babunge reduplication as progressive and intensive is the hinge which links the Isu reduplication in intensive function and the palatal infix for the imperfective.

(35) Babungo (South Ring): prefix *C$_1$i-* for progressive(-imperfective) (Schaub 1985: 353ff.)

(a) H-verbs: *bwéy* ‘sleep’, *sáŋ* ‘beat’, *kúunə́* ‘return home’, *nyɔ́ŋsə́* ‘suckle, breastfeed’

simplex: perfective	progressive(-imperfective)
ŋwə́ ˈbwéy ‘he slept’	*ŋwə́ ˈbɪ́-ˈbwéy* ‘he is sleeping’
ŋwə́ ˈsáŋ wée ‘he beat a child’	*ŋwə́ ˈsɪ́-ˈsáŋ wée* ‘he is beating a child’
ŋwə́ ˈkúunə́ ‘he returned home’	*ŋwə́ ˈkɪ́-ˈkúunə́* ‘he is returning home’
ŋwə́ ˈnyɔ́ŋsə́ wée ‘she suckled the child’	*ŋwə́ ˈnyɪ́-ˈnyɔ́ŋsə́ wée* ‘she is suckling the child’

(b) L-verbs: *bwèy* ‚live’, *fée* ‚fear’, *nəʔnə́* ‚shake’, *fésə́* ‚frighten’

simplex: perfective	progressive(-imperfective)
ŋwə́ bwêy ‘he lived’	*ŋwə́ ˈbɪ́-bwéȳ* ‘he is living’ = ‘he is alive’
ŋwə́ ˈfée bɔ́ɔ ‘he feared the leopard’	*ŋwə́ ˈfɪ́-fée ˈbɔ́ɔ* ‘he is fearing the leopard’
ŋwə́ nə́ʔnə̀ ‘he shook (himself)’	*ŋwə́ ˈnɪ́-nə́ʔˈnə́* ‘he is shaking’
ŋwə́ fésə́ wèe ‘he frightened a child’	*ŋwə́ ˈfɪ́-féˈsə́ wée* ‘he is frightening a child’

(36) Babungo (South Ring): prefix *C$_1$i-* for intensive (Schaub 1985: 218)

bà̀y ‘become red’

ŋwə́ bɪ́-bā́ȳ ‘he is redding; he becomes red; he is very red’

Reanalysing Schaub’s 1985 description of the aspectual categories in Babungo, it appears that the progressive is part of a tripartite opposition involving perfective and imperfective. According to him (1985: 217), the progressive is based on the imperfective: “progressive aspect is marked by a prefix, consisting of a repetition of the initial consonant of the verb root [...] plus a central vowel. The tones found in the progressive aspect indicate that it is an elided form of a reduplication of the verb in its imperfective aspect.” (Schaub 1985: 217). The perfective is marked by a floating *H prefixed to the verb, while the imperfective is marked by a prefixed succession of floating *LH (Schaub 1985: 337ff.). Assuming that the Babungo imperfective morpheme is cognate to the Isu floating *L which marks the imperfective in Isu non-initial serialised verbs, the following comparative interpretation emerges: Babungo represents a more archaic stage of the aspectual marking than Isu. Tonal marking of the imperfective has been restricted to non-initial serialised verbs in Isu, while the former progressive marking strategy *C_1i-, retained as such in Babungo, has been grammaticalised as a secondary imperfective marking strategy in Isu, the semantic extension being formally reflected by a process of erosion which results in the high vowel of the prefix slipping into the root as an infix. Formally and functionally these lines of development present nothing peculiar. Actually it is quite common for a progressive to be formed by reduplication and to evolve into an imperfective (Bybee, Perkins & Pagliuca 1994: 166-175).

2.3.3.3 Initial consonant mutation

The same historical scenario of a haplologically motivated reduction of initial high vowel reduplication also helps to explain another peculiarity in verbal morphophonology: the alternation of *b* vs. *bv* to be observed in the verbs cited in (37).

(37) Paradigmatic alternation of *b* vs. *bv*

Perfective	imperfective	pluractional perfective	pluractional imperfective
bʊ́nɪ́ ‘sleep’	***bv***ʊ́nə́	-	-
bwɔ́ʔ ‘sound’	*bwɔ́ʔɔ́*	***bv***ʊ́ʔɪ́	***bv***ɔ́ʔɔ́
bwɔ̀ʔ ‘drill’	*bwɔ̀ʔɔ̀*	***bv***ʊ̀ʔɪ̀, *bv*ɔ̀ʔɪ̀	***bv***ɔ̀ʔɔ̀
bwà̀lɪ̀ ‘force into or through a set of sticks in order to create space’	***bv***ʊà̀lə̀	-	-
bwá ‘bend, turn; become calm’	***bv***ʊáa	-	-

In this context, **bv* could be analysed as the result of a regressive spirantisation triggered by a high vowel, which is reminiscent of the well-known Bantu spirantisation (Hyman 2003: 53, Schadeberg 1994/95) and might be integrated into the following scenario of morphophonological development (38).

(38) Chronology of high vowel reduplication and spirantisation

Perfective stem: *bʊ́n-ɪ́* 'sleep'	
(a) imperfective derivation by *C_1*i- -ə*	****b*$_1$*i-*b_2*ʊ́n-ə́*
(b) haplologically motivated deletion of root initial C_2	*b_1*i-Ø-ʊ́n-ə́*
(c) spirantisation (under high vowel influence)	*b_1***v***i-ʊ́n-ə́*
(d) monophthongisation and deletion of the high vowel	*b_1*vØ-ʊ́n-ə́*
(e) paradigmatically conditioned reanalysis of the reduplicated initial as part of the root	*b_1*vʊ́n-ə́*

Two examples in (37) present additional complications: first, the initial affricates encode the pluractional, not the imperfective; second, there is a root internal change in vowel quality which could be ascribed to the operation a regressive transglottal assimilation discussed in (42-48). The morphophonological development of these examples unfold in full detail in (39).

(39) Chronology of high vowel reduplication and spirantisation

perfective stems	*bwɔ̀ʔ* 'drill' (< **bʊ̀ʔ*)	*bwɔ́ʔ* 'sound' (< **bʊ́ʔ*)
(a) pluractional-perfective derivation by *C_1*i- -i*	****b*$_1$***i***-*b*$_2$*ʊ̀ʔ-ì*	****b*$_1$***i***-*b*$_2$*ʊ́ʔ-ɪ́*
(b) haplologically motivated deletion of root initial C_2	*b_1*i-Ø-ʊ̀ʔ-ì*	*b_1*i-Ø-ʊ́ʔ-ɪ́*
(c) spirantisation (under high vowel influence)	*b_1***v***i-ʊ̀ʔ-ì*	*b_1***v***i-ʊ́ʔ-ɪ́*
(d) monophthongisation and deletion of the high vowel	*b_1*vØ-ʊ̀ʔ-ì*	*b_1*vØ-ʊ́ʔ-ɪ́*
(e) paradigmatically conditioned reanalysis of the reduplicated initial as part of the root	b_1*vʊ̀ʔ-ì*	b_1*vʊ́ʔ-ɪ́*

The feature shared by the examples in (37-39) is that the initial affricate *bv*, irrespective of whether it encodes pluractionality or imperfectivity, represents the last trace of the original high vowel reduplicative prefix. Mutations of this kind seem to be restricted to the affricative alternation *b* > *bv* in Isu. In neighbouring Zoa, however, the initial consonant mutation also affects the consonants *s*, *z* and *dz*, which are replaced by *ʃ*, *ʒ* and *dʒ*, respectively, in the imperfective, as indicated in (40).

(40) Zoa: palatalisation and affrication of the initial consonant in the imperfective

type of mutation	perfective	imperfective	gloss
s > *ʃ*	*sʊ̀w*	*ʃù, sù*	'wash'

z > *ʒ*	*zʋ́w*	*ʒú*	‘hear’
dz > *dʒ*	*dzà̀o*	*dʒò̀o*	‘divide, share’
dz > *dʒ*	*dzg̀*	*dʒì̀g̀ [dʒg̀]*	‘say’
b > *bv*	*bʌ́b*	*bvə́bə́*	‘ask’

The affricative alternation *b* > *bv* therefore is part of the same paradigm as the palatalising alternations *s* > *ʃ* and *z* > *ʒ*. This suggests that both process types, i.e. affrication and palatalisation, originate in the same source: a high front vowel. Thus, *bv* is the regular result of palatalisation of *b* in Isu as well as in Zoa. The difference between both languages is that palatalisation of the initial consonant is much more advanced in Zoa than in Isu.

The affricative-palatalising initial consonant mutation must be quite old, since its irregular pattern of distribution across the modern West Ring languages points to the fact that it has been superseded by secondary processes of analogical leveling and backformation. On this line of thought, the initial affricate in the perfective form of the Aghem reflex of Proto-West-Ring **bʊ́b* ‘ask’ in (41) must be analysed as the result of a backformation based on the imperfective form.

(41) Distribution of *b* vs. *bv* in Proto-West Ring **bʊ́b* (PF) ‘ask’ vs. **bi-bʊ́b-ə* (IPF)

	perfective	imperfective
Aghem	*bvʊ́*	*bvʊ́ɔ*
Bu	*bɪ́*	[?]
Isu	*bʌ́b*	*bə́bə́*
Weh	*bʌ́b*	[?]
Zoa	*bʌ́b*	*bvə́bə́*

2.3.3.4 Internal vowel alternations

The consonant mutations in the verbal aspectual paradigm are accompanied by vowel alternations, the most regular of which is the change from *ʊ* in the perfective to *ɔ* in the imperfective.[8]

(42) Alternation of root vowel *ʊ* (perfective) vs. diphthong *ʊɔ* ~ *wɔ* (imperfective)

[8] Other contexts present various marginal types of vowel alternations, e.g. the derivation of the causative stem *ŋù[u]mì* ‘heat up, excite’ from the root *ŋə̀m* ‘become hot’ displays a change of *ə* to *u*. Comparative evidence confirms the originality of a lexical back rounded vowel in the Proto-West Ring reconstruction **nʊ̀m*. In Isu backness spread regressively to the preceding nasal turning it into a velar and leaving a delabialised and centralised vowel in the root. Thus, the causative form, probably derived via a chain of changes such as **ŋi-ŋʊ̀m-ì* > **ŋiʊ̀m-ì* > **ŋù[u]m-ì*, retains an original feature which has been shifted in the simplex.

perfective	imperfective
zʊ́ʔɪ́ ‘explain; teach; learn’	*zʊɔ́ʔɔ́ ~ zwɔ́ʔɔ́*
zʊ̀ʔɪ̀ ‘press, squeeze’	*zʊɔ̀ʔɔ̀ ~ zwɔ̀ʔɔ̀*
bwɔ̀ʔ (< **bʊ̀ʔ*) ‘drill’[9]	*bʊɔ̀ʔɔ̀ ~ bwɔ̀ʔɔ̀*
bvʊ́ʔɪ́ ‘call’	*bvʊɔ́ʔɔ́ ~ bvɔ́ʔɔ́*
dʊ́ʔɪ́ ‘rejoice, be happy’	*duɔ́ʔɔ́ ~ dwɔ́ʔɔ́*
tsʊ̀ʔ ‘rinse’	*tsʊɔ̀ʔɔ̀ ~ tswɔ̀ʔɔ̀*
tsʊ́ʔɪ́ ‘be merry, be cheerful’	*tsʊɔ́ʔɔ́ ~ tsəɔ́ʔɔ́*
twʊ̀ʔɪ̀ ‘take good care for’	*twʊɔ̀ʔɔ̀ ~ twɔ̀ʔɔ̀*
dzʊ̀ʔɪ̀ ‘get loose, make loose’	*dzwɔ̀ʔɔ̀*

This vowel alternation is the result of a series of assimilations which start from an imperfective form with suffix *ə*, as sketched in (43) and exemplified in (44) in single steps. First, the verbal root vowel spreads its features [+back, +round] to the schwa suffix, turning it into *ɔ*, already observed in the verbs of group E3 in (22). In the next step the quality of this vowel is anticipated through the glottal stop, resulting in a root internal diphthong *ʊɔ*, the first part of which then develops into an approximant. ~

(43) Morphophonological details of imperfective formation of verbs with the structure **Cʊʔ*

(a) suffixation of the imperfective marker: **Cʊʔ-**ə***

(b) progressive transglottal spreading of the features [+back, +round] to the imperfective suffix: **Cʊʔ-**ɔ***

(c) diphthongisation by partial regressive transglottal vowel assimilation: *Cʊɔʔ-ɔ*

(d) diphthong resolution by creation of an approximant (loss of vowel mora?): **C**w**ɔʔ-ɔ*

(44) Assimilations create vowel alternations in the paradigm

perfective stems	*zʊ̀ʔ-ɪ̀* ‘press’	*zʊ́ʔ-ɪ́* ‘explain’
(a) imperfective derivation via **-ə*	**zʊ̀ʔ-ə̀*	**zʊ́ʔ-ə́*
(b) progressive transglottal spreading of the features [+back, +round]	**zʊ̀ʔ-**ɔ̀***	**zʊ́ʔ-**ɔ́***
(c) partial regressive transglottal vowel assimilation (diphthongisation)	**zʊ**ɔ̀**ʔ-ɔ̀*	**zʊ**ɔ́**ʔ-ɔ́*
(d) diphthong resolution by approximant deletion	*z**w**ɔ̀ʔɔ̀*	*z**w**ɔ́ʔɔ́*

[9] Comparative evidence from the West Ring reconstruction **bʊ̀k* suggests that the modern Isu perfective form *bwɔ̀ʔ* with the labial glide has arisen by backformation from the imperfective.

This means that the labialisation of the initial consonant in the contemporary imperfective forms reflects the original labial root vowel *ʊ*, still present in the perfective base, while the more open vowel *ɔ* results from a regressive assimilation of the imperfective suffix.

(45) Assimilations create vowel alternations in the paradigm

	perfective	imperfective	pluractional perfective	pluractional imperfective
'drill'	*bwɔ̀ʔ* (< **bʊ̀ʔ*)	*bwɔ̀ʔɔ̀* (< **bʊ̀ʔ-ə̀*)	*bvʊ̀ʔì*	*bvɔ̀ʔɔ̀*
'sound' > 'call' (PL)	*bwɔ́ʔ* (< **bʊ́ʔ*)	*bwɔ́ʔɔ́* (< **bʊ́ʔ-ə́*)	*bvʊ́ʔí*	*bvɔ́ʔɔ́*

The labial approximants in the contemporary perfective forms of the verbs *bwɔ̀ʔ* 'drill' and *bwɔ́ʔ* 'sound' in (45) result from backformations which are based on the imperfective forms *bwɔ̀ʔɔ̀* and *bwɔ́ʔɔ́*, respectively, and which must have ousted the prior bases **bʊ̀ʔ* and **bʊ́ʔ*, respectively. In the course of analogical leveling in the aspectual paradigm, the final vowel in the imperfective forms has been reanalysed as the sole imperfective marker, while the fusional results of partial regressive transglottal vowel assimilation (diphthongisation) (46c) and diphthong resolution by approximant deletion (46d) have been retained and carried over to the perfective. In both cases, the underlying root vowel *ʊ* has been retained as such only in the pluractional perfective (probably under the influence of the suffix vowel *–i*). In the case of *bwɔ̀ʔ* 'drill', this analysis is confirmed by external comparative evidence, since this Isu reflex could be linked very smoothly to the West-Ring reconstruction **bʊ̀k* 'drill'.[10]

(46) Vowel assimilations create internal vowel alternations

perfective stems	*bwɔ̀ʔ* 'drill' (< **bʊ̀ʔ*)	*bwɔ́ʔ* 'sound' (< **bʊ́ʔ*)
(a) imperfective derivation by **-ə*	**bʊ̀ʔ-ə̀*	**bʊ́ʔ-ə́*
(b) progressive transglottal spreading of the features [+back, +round]	**bʊ̀ʔ-**ɔ̀***	**bʊ́ʔ-**ɔ́***
(c) partial regressive transglottal vowel assimilation (diphthongisation)	**bʊ**ɔ̀**ʔ-ɔ̀*	**bʊ**ɔ́**ʔ-ɔ́*
(d) diphthong resolution by approximant creation	*b**w**ɔ̀ʔɔ̀*	*b**w**ɔ́ʔɔ́*

[10] If there was no such external evidence, the root vowel *ʊ* in those verbs which contain the perfective suffix *-i* (48) might alternatively be explained as resulting from regressive vowel raising triggered by *-i*. There is no compelling Isu internal evidence to decide which way the assimilation went and which of the contemporary aspectual forms represent the original lexical vowel quality.

The derivation of the imperfective pluractional forms in (47) combines regressive transglottal assimilation (47c) with the reduction of high vowel reduplication. Note that under these conditions there is no diphthongisation and subsequent approximant creation, i.e. the regressive transglottal assimilation is not partial, as in the case of the simplex stems (46c, 44c), but rather total. It seems as if there is no need to retain the high quality of the root vowel, probably motivated by the presence of the reduplicative prefix which contains a high vowel. Historically speaking, the high root vowel has been compensated by the presence of the high vowel prefix which has been transferred to the initial consonant in the form of affrication.

(47) Chronology of high vowel reduplication and spirantisation in imperfective pluractionals

perfective stems	*bwɔ̀ʔ* 'drill' (**bʊ̀ʔ*)	*bwɔ́ʔ* 'sound' (< **bʊ́ʔ*)
(a) imperfective pluractional derivation by **C_1i- -ə*	****b$_1$i**-b$_2$ʊ̀ʔ-ə̀*	****b$_1$i**-b$_2$ʊ́ʔ-ə́*
(b) progressive transglottal spreading of the features [+back, +round]	**b$_1$i-bʊ̀ʔ-**ɔ̀***	**b$_1$i-bʊ́ʔ-**ɔ́***
(c) total regressive transglottal vowel assimilation	**b$_1$i-b**ɔ̀**ʔ-ɔ̀*	**b$_1$i-b**ɔ́**ʔ-ɔ́*
(d) haplologically motivated deletion of root initial C_1	**b$_1$i-∅ɔ̀ʔ-ɔ̀*	**b$_1$i-∅ɔ́ʔ-ɔ́*
(e) spirantisation (under high vowel influence)	**b$_1$**v**i-ɔ̀ʔ-ɔ̀*	**b$_1$**v**i-ɔ́ʔ-ɔ́*
(f) monophthongisation (deletion of the high vowel)	**b$_1$v∅-ɔ̀ʔ-ɔ̀*	**b$_1$v∅-ɔ́ʔ-ɔ́*
(g) paradigmatically conditioned reanalysis of the reduplicated initial as part of the root	*b$_1$vɔ̀ʔ-ɔ̀*	*b$_1$vɔ́ʔ-ɔ́*

The operation of all these processes in Isu brings about the establishment of a fixed pattern of morphologically conditioned vowel changes in the aspectual paradigm, i.e. root vowel *ʊ* in the perfective alternates with *ɔ* in the imperfective. Unless the process is combined with an affrication of the initial consonant (resulting from reduced high vowel reduplication), the vowel *ʊ* in the perfective alternates with *ʊɔ* or *wɔ* in the imperfective, where the higher round vowel, i.e. the reflex of the original quality of the root vowel, is preserved in a labialisation of the initial consonant. The stages in this development are detailed and exemplified in (48).

(48) Morphophonological adaptations of the imperfective pattern **CʊʔV*

perfective	internal reconstruction of imperfective form	progressive spreading of the features [+back, +round]	partial regressive transglottal vowel assimilation	diphthong resolution
zʊ́ʔɪ́ 'explain'	**zʊ́ʔ-ə́*	*zʊ́ʔ-ɔ́*	*zʊɔ́ʔɔ́*	*zwɔ́ʔɔ́*
zʊ̀ʔɪ̀ 'squeeze, pressen'	**zʊ̀ʔ-ə̀*	*zʊ̀ʔ-ɔ̀*	*zʊɔ̀ʔɔ̀*	*zwɔ̀ʔɔ̀*
bwɔ̀ʔ (< **bʊ̀ʔ*)	**bʊ̀ʔ-ə̀*	*bʊ̀ʔ-ɔ̀*	*bʊɔ̀ʔɔ̀*	*bwɔ̀ʔɔ̀*

‘drill’				
dʊ́ʔɪ́ ‘be happy’	**dʊ́ʔ-ə́*	*dʊ́ʔ-ɔ́*	*dʊɔ́ʔɔ́*	*dwɔ́ʔɔ́*
tsʊ̀ʔ ‘rinse’	**tsʊ̀ʔ-ə̀*	*tsʊ̀ʔ-ɔ̀*	*tsʊɔ̀ʔɔ̀*	*tswɔ̀ʔɔ̀*
twʊ̀ʔɪ̀ ‘take good care of’	**twʊ̀ʔ-ə̀*	*twʊ̀ʔ-ɔ̀*	*twʊɔ̀ʔɔ̀*	*twɔ̀ʔɔ̀*
bvʊ́ʔɪ́ ‘call’	**bvʊ́ʔ-ə́*	*bvʊ́ʔ-ɔ́*	*bvʊɔ́ʔɔ́*	*bvɔ́ʔɔ́*
tsʊ́ʔɪ́ ‘be cheerful’[11]	**tsʊ́ʔ-ə́*	*tsʊ́ʔ-ɔ́*	*tsʊɔ́ʔɔ́*	*tsəɔ́ʔɔ́*

3 A unified model of the historical development of total reduplication in Benue-Congo

Faraclas & Williamson 1984 present two models in order to explain the distinct paths of morphophonological development of two different strategies of reduplication in Niger-Congo: high vowel reduplication in (49) vs. non-high vowel reduplication in (50). “While Niger-Congo ([+high] vowel, RK) reduplication seems to have developed through the reduplication of the verb root, [-high] vowel reduplication could have resulted from the fusion of a verb root and a cognate object (a verbal noun derived from the verb in question) following it” (Faraclas & Williamson 1984: 6). In their model, high vowel reduplication is the final outcome of reduction of a total reduplication of the verbal root CVC-CVC (49a). This reduction includes the loss of the final consonant in the first (reduplicated) part (49b) and the reduction of the vowel (49c) which means maximal closure plus centralisation (if the phonological system of the respective language supports this option), both processes motivated by „stricture assimilation“ „to bring about a maximally reduced vowel in a reduplicated syllable“ (Faraclas & Williamson 1984: 3). Within Grassfields, the transition of (49a-c) could be exemplified by the oscillation between Proto West Ring reconstructions **kə́-sɔ́ʔ-sɔ́ʔɔ́* (7/8) ‘termite, white ant’ (total reduplication variant) and **kə́-sɪ́-sɔ́ʔɔ́* (reduced variant with high vowel reduplication). It has also been reported for Eastern Grassfields Fe’fe’, where the majority of the villages, e.g. Bafang and Petit Diboum, have developed high vowel reduplication from what must have been total reduplication, as attested in Banka (Hyman 1972: 95-126).

West Ring evidence from Isu and Zoa now point to the fact that high vowel reduplication certainly does not represent the final stage of reduction. Instead, high vowel reduplication can further be reduced via haplologically motivated deletion of the initial consonant of the verbal root (49d), producing a form which retains nothing but the (high) vowel of the original reduplicated syllable which slips as infix into the

[11] This is a pluractional form of *tsɔ́ʔ* ‘laugh’, attesting a process of regressive transglottal vowel assimilation triggered by the high vowel pluractional suffix *–i*: *tsʊ́ʔɪ́* < **tsɔ́ʔ-ɪ́*.

root by way of reanalysis of morpheme boundaries. Obviously even this vowel may disappear, leaving a terminal trace in spiranticising or simply lengthening the initial consonant (49e-f).

(49) Origin and further reduction of high vowel reduplication (based on Faraclas & Williamson 1984)

(a) total reduplication of the verb stem	CVC-CVC
(b) deletion of final consonant in first part	CV∅-CVC
(c) reduction of the reduplicated vowel	C*i*-CVC, C*i*-CVC, C*u*-CVC
(d) haplologically motivated deletion	$CV_{[+hoch]}$-∅VC
(e) affrication (under high vowel influence)	$C_{[+affr]}V_{[+hoch]}$-VC, $CCV_{[+hoch]}$-VC
(f) high vowel deletion	$C_{[+affr]}$∅-VC, CC-VC

(50) Origin and further reduction of non-high vowel reduplication (based on Faraclas & Williamson 1984: 14), exemplified with Obolo (Lower Cross)

(a) construction of verb plus cognate complement (e.g. for predication focus)	CVC *ə*-CVC
(b) vowel assimilation	CVC *o*-CVC, CVC *e*-CVC
(c) consonant deletion	CV*o*-CVC, CV*e*-CVC
(d) vowel fusion / approximant creation	Cw*o*-CVC, Cy*e*-CVC
(d) approximant deletion	C*o*-CVC, C*e*-CVC

In the course of these developments a complete reduplication of the verbal root becomes condensed in a modification of the root initial consonant which is manifest synchronically as an affrication or lengthening mutation in the morphological paradigm. Against the background of this scenario, the proliferation of highly elaborate systems of secondary modifications in initial consonants observed in a number of Grassfields languages, e.g. in Ngiemboon (Anderson 2001), might prove to reflect even further advanced stages of development in which the consonant alternations have lost their grammatical functions, becoming fully lexicalised.[12]

4 Conclusion

The focus of this contribution has been on the diachronic analysis of the palatal infix in Isu which serves various functions such as derivation of causative and pluractional verb stems and formation of the imperfective. It has been shown that, formally, this

[12] It also has to be checked how phenomena such as internal vowel lengthening in durative function in Lamnso' (*bám* 'hold' vs. *baámé* 'embrace', see Ndzenyuy & Mba 2003: 51) and infixed mid vowels for derivation of participles in Tikar (*tan* 'count' vs. *tean* 'counted', see Stanley 1991: 102-125) fit into this typological scenario.

infix originates in high vowel reduplication which is widespread in Kwa and Benue-Congo languages of West Africa and even attested as a cognate predecessor form in progressive function in the South Ring language Babungo. From a functional point of view, a former high-vowel-reduplicative progressive in Isu became increasingly grammaticalised as an imperfective, intruding upon the domain of the older imperfective which operates with the schwa suffix.[13] In this way, the palatal infix of Isu and some of its closest neighbours does not stand out as a weird phenomenon which sets these languages apart from the rest of Benue-Congo, but rather intergrates fairly smoothly into the overall constitution of Benue-Congo.

Abbreviations

[13] Taking into account the relation between meaning and form, this investigation also illustrates the fact that there is a tendency in Niger-Congo (and probably universally, see Bybee 1985) to draw aspect marking strategies as close as possible to the verbal root even to such a degree that phonological fusion occurs which is a step towards conflation of lexical meaning and aspectual meaning, motivated by the notion of semantic relevance. The palatal infix for imperfective aspect evolving from initial high vowel reduplication in some Grassfields languages of the West Ring group is one example. Another example can be seen in the intrusion of parts of the perfect suffix ***-*ide** into the verbal root in some Bantu languages, especially in zone J – a process known as „imbrication“ (Bastin 1983, 2003: 526-7).

CF clause focus
CFG centrifugal
COP copula
D1 near demonstrative
DUR durative
F focalisation
FUT1 near future
FUT2 distant future
IPF imperfective
O object
OF out-of-focus marker
P0 immediate past
P1 hodiernal past
P2 hesternal past
PF perfective
PLUR pluractional
S subject
SJN subjunctive
TERM terminative

References

Ameka, Felix. 1999. The typology and semantics of complex nominal duplication in Ewe. *Anthropological Linguistics* 41,1: 75-106.

Anderson, Stephen. 2001. Phonological characteristics of Eastern Grassfields languages. In: Ngessimo M. Mutaka & Sammy B. Chumbow (eds), *Research Mate in African Linguistics: Focus on Cameroon: a Fieldworker's Tool for Deciphering the Stories Cameroonian Languages Have to Tell; in Honor of Professor Larry N. Hyman*, Köln: Rüdiger Köppe Verlag, 33-54.

Anyanwu, Rose-Juliet. 1998. *Aspects of Igbo grammar: phonetics, phonology, morphology and the tonology of nouns*. Hamburg: Lit.

Awobuluyi, Oladele. 1982. *Essentials of Yoruba grammar*. Ibadan: University Press.

Bamgbose, Ayo. 1974 *A short Yoruba grammar*. Ibadan: Heinemann.

Bastin, Yvonne. 1983. *La finale verbale -ide et l'imbrication en bantou*. Tervuren: Musée Royal de l'Afrique Centrale.

Bastin, Yvonne. 2003. The interlacustrine zone (Zone J). In: Nurse, Derek & Gérard Philippson (eds.), *The Bantu languages*, London: Routledge, 501-528.

Breton, Roland & Bikia Fohtung. 1991. *Atlas administratif des langues nationales du Cameroun*. Yaoundé & Paris: CERDOTOALA, ACCT.

Bybee, Joan L. 1985. *Morphology. A study of the relation between meaning and form*. Amsterdam & Philadelphia: John Benjamins.

Bybee, Joan L., Pagliuca, W. & R. Perkins. 1994. *The evolution of grammar: tense, aspect and modality in the languages of the world*. Chicago & London: University of Chicago Press.

Essono, Jean-Jacques Marie. 2000. *L'Ewondo - langue bantu du Cameroun: phonologie - morphologie – syntaxe*. Yaoundé: Presses de l'Université Catholique d'Afrique Centrale.

Faraclas, Nicholas & Kay Williamson. 1984. Assimilation, dissimilation and fusion: vowel quality and verbal reduplication in Lower Cross. *Journal of African Languages and Linguistics* 6,1: 1-18.

Gerhardt, Ludwig. 1988. Bemerkungen zur Morphologie des Kwoi. In: Wilhelm J.G. Möhlig (ed.), *Afrikanistische Beiträge zum XXIV. Deutschen Orientalistentag* (Afrikanistische Arbeitspapiere Sondernummer), Köln: Institut für Afrikanistik, 53-65.

Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: **http://www.ethnologue.com/**.

Heine, Bernd & Mechthild Reh. 1984. *Grammaticalization and reanalysis in African languages*. Hamburg: Helmut Buske.

Hyman, Larry. 1972. A phonological study of Fe'fe'-Bamileke. *Studies in African Linguistics*, Supplement 4.

Hyman, Larry. 1979. *Aghem grammatical structure*. Los Angeles: Department of Linguistics UCLA.

Hyman, Larry. 2003. Segmental phonology. In: Nurse, Derek & Gérard Philippson (eds.), *The Bantu languages*, London: Routledge, 42-58.

Kießling, Roland. 2003. Infix genesis in South Cushitic. In: M. Lionel Bender, Gábor Takács & David L. Appleyard (eds.), *Selected comparative-historical Afrasian linguistic studies in memory of Igor M. Diakonoff*, München: Lincom Europa, 109-122.

Kießling, Roland. 2004. Kausation, Wille und Wiederholung in der verbalen Derivation der westlichen Ring-Sprachen (Weh, Isu). In: Raimund Kastenholz & Anne Storch (eds.), *Sprache und Wissen in Afrika*, Köln: Rüdiger Köppe, 159-181.

Kießling, Roland. 2006. Woher kommen die Infixe im Isu (Kameruner Grasland)? *Afrikanistik Online*. http://www.afrikanistik-online.de/archiv/2006/594/.

Lefebvre, Claire & Anne-Marie Brousseau. 2002. *A grammar of Fongbe*. Berlin & New York: Mouton de Gruyter.

Marantz, A. 1994. Reduplication. In: Asher, R.E. (ed.), *The encyclopedia of language and linguistics*, Oxford, New York, Seoul & Tokyo: Pergamon Press, 3486-87.

Moravcsik, Edith A. 1978. Reduplicative constructions. In: Joseph H. Greenberg (ed.), *Universals of Human Language* 3, Stanford: University Press, 297-334.

Ndzenyuy, Vernyuy Francis & Gabriel Mba. 2003. Verbal Extensions in Lamnso. In: Idiata, Daniel Franck & Gabriel Mba (eds.), *Studies on voice through verbal extensions in nine Bantu languages spoken in Cameroon, Gabon, DRC and Rwanda*, München: Lincom, 39-63.

Nissim, Gabriel. 1975. *Cours de grammaire bamileke*. Yaoundé: Université de Yaoundé.

Nissim, Gabriel. 1981. *Le bamileke-ghomálá' (parler de Bandjoun, Cameroun): phonologie, morphologie nominale, comparison avec des parlers voisins*. Paris: SELAF.

Redden, James E. 1979. *A descriptive grammar of Ewondo*. Carbondale: Department of Linguistics, Southern Illinois University (Occasional Papers on Linguistics 4).

Schachter, Paul & Victoria Fromkin. 1968. *A Phonology of Akan : Akuapem, Asante & Fante*. Los Angeles : University of California.

Schadeberg, Thilo C. 1994/95. Spirantization and the 7-to-5 vowel merger in Bantu. In: Dominicy, Marc & Didier Demolin (eds.), *Sound change*, Amsterdam: John Benjamins, 73-84.

Schaub, Willi. 1985. *Babungo*. London & al.: Croom Helm.

Stanley, Carol. 1991. *Description morpho-syntaxique de la langue tikar*. Lille: Université de Lille III.

Ward, Ida.C. 1952. *An introduction to the Yoruba language*. Cambridge: Heffer & Sons.

Westermann, Diedrich. 1944. Form und Funktion der Reduplikation in einigen westafrikanischen Sprachen. *Studien zur Auslandskunde. Afrika* 3,2: 83-104.