

## Derivationalism in Kikamba Vowel Hiatus Phenomena\*

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### §0 Introduction

Optimality Theory assumes a single step from underlying to surface form mediated by GEN and H-EVAL. Kikamba phonology challenges that organization of the grammar. Underlying representations in Kikamba have empty skeletal positions which play an active role in the grammar up to a certain point, after which they are deleted.

- (1) Vowel hiatus- Evidence for the presence of Empty Cs  
Vowel sequences coalesce as in (a). Lack of syllable fusion indicates the underlying presence of an empty C as in (b).

a. /ko-aǝ-a/ infin-stem-infl	kwaǝǝǝ	‘to govern’
b. /ko-Cǎǝ-a/ infin-stem-infl	ko.ǎǎǎ	‘to shoot’

- (2) Vowel shortening- Evidence that the Empty C deletes  
 $V + V \rightarrow GVV$  in (a). In spite of the empty C in (b), [twaa] shortens before a long vowel as though the C were not present, because the empty C has been deleted at this point in the grammar.

a. /né-tó-a-kon-á/ t/a-1pl-t/a-stem-infl	nétwáakoná	‘we just hit’
b. /né-tó-a-Ceβ-á/ t/a-1pl-t/a-stem-infl	nétwá.eβá	‘we just paid’

### §1 Evidence for the presence of empty Cs

#### 1.1 Vowel hiatus phenomena

- (3) Glide Formation with Compensatory Lengthening:  
The first strategy for eliminating vowel hiatus

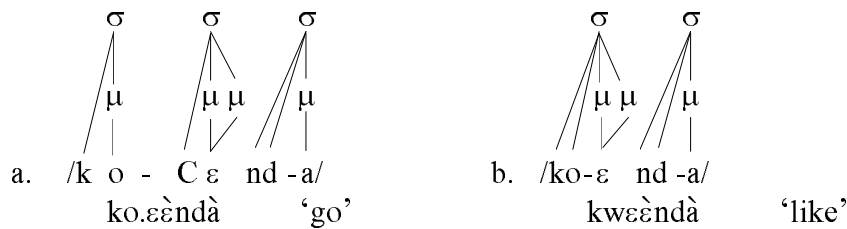
a. /ko-ák-a/ infin-stem-infl	kwááá	‘to build’
b. /ko-enok-a/ infin-stem-infl	kweenokà	‘to go home’
c. /ko-ít-a/ infin-stem-infl	kwíitá	‘to strangle’

- (4) When a surface vowel-vowel sequence does not coalesce, the Onset Principle is not violated because the empty root node is syllabified as the onset of the syllable.

C = empty root node (in UR)      (.) = syllabification break (in surface forms)

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(5) GF with CL in other verb roots demonstrates this robust pattern in the language

- a. /ko-ót-a/ kwóótǎ 'to warm self'    b. /ko-Cóót-a/ ko.óótà 'to dream'  
 c. /ko-ék-a/ kwéékǎ 'to do'                      d. /ko-Cεβ-a/ ko.εβà 'to pay'  
 e. /ko-ín-a/ kwíinǎ 'to dance'                      f. /ko-Cind-a/ ko.ì̀ndà 'to submerge'

(6) Mid Vowel Fusion: The second strategy for eliminating vowel hiatus  
 The same verbs which fail to undergo GF fail to undergo MVF.

- a.        a + e, ε ---> εε                      a + o, o ---> oo  
 b. /ko-má-εnd-a/                      komé̀̀ndà                      'to like them'  
 c. /ko-má-Cεnd-eC-a/                      komá.εndε.à                      'to go for them'

(7) MVF in other verb roots demonstrates this robust pattern in the language

- a. /ko-má-enz-eC-a/                      koméεnzε.à                      'to dig for them'  
 b. /ko-má-Cεβ-a/                      komá.εβà                      'to pay them'  
 c. /ko-má-ós-eC-a/                      komóóσε.à                      'to take for them'  
 d. /ko-má-Cóót-eC-a/                      komá.óóτε.à                      'to dream for them'  
 e. /ko-má-ókit-a/                      komóókità                      'to fight them'  
 f. /ko-má-Cóm-a/                      komá.ómǎ                      'to bite them'

(8) The empty C may surface as a real consonant if the verb stem contains an /l/,  
 [lateral] spreads to the empty C, causing it to surface as /l/, as in (b-c) below.

- a. /ko-suunɣ-eC-a/                      kosuunɣε.à                      'to guard for'  
 b. /ko-βul-eC-a/                      ko-βul-el-à                      'to go through pile for'  
 c. /ko-lées-eC-a/                      ko-lées-el-à                      'to climb mountain for'

## 1.2 The 1st singular Object Prefix

(9) The 1st sing. Object Prefix is underlyingly a moraic nasal unspecified for place of articulation; it assimilates to the place of articulation of the following consonant.

- a. /ko-N-βiindo-a/                      koombiindo.à                      'to wake me up'  
 b. /ko-N-tál-a/                      koondǎlá                      'to count me'  
 c. /ko-N-kon-a/                      koonɣonà                      'to hit me'  
 d. /ko-N-suunɣ-a/                      koonzuunɣà                      'to guard me'

● After the 1st sing. Object prefix, phonetically-vowel initial verbs surface with an excrement consonant; and that consonant is different for V- and Empty C-initial verbs.

(10) Vowel-initial verbs surface with [b]

infinitive	1st sing. OP form	gloss
a. kwááká	koombáká	'to strengthen me'
b. kweenzá	koombenze.à	'to dig for me'
c. kwéénzá	koombénzá	'to shave me'
d. kwííná	koombíne.à	'to sing for me'
e. kookità	koombokità	'to fight me'
f. kwóóná	koombóná	'to see me'
g. kúumelà	koombúmèlà	'to appear to me'

(11) Empty C-initial verbs surface with [d]

infinitive	1st sing. OP form	gloss
a. ko.a.à	koonda.e.à	'to divide for me'
b. ko.eβà	koondeβà	'to pay me'
c. ko.εkà	koondεkà	'to leave me'
d. ko.i.ità	koondi.ità	'to treat me'
e. ko.o.à	koondo.e.à	'to buy for me'
f. ko.ɔ.à	koondɔ.à	'to bewitch me'
g. ko.ú.á	koondú.e.à	'to cook for me'

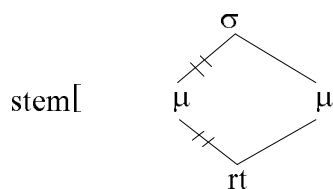
- With the addition of the 1st sing. Object Prefix, the length of a stem-initial long vowel is different in V- and Empty C-initial verbs.

(12) Vowel-initial verbs surface with a SHORT vowel following the 1st sing OP /N/: They are subject to a rule of stem-level Initial Shortening.

a. infinitive	/ko-óok-a/	kóòkà	'to come'
b. 1st sing. OP form	/ko-N-óok-eC-a/	koombóke.à	'to come for me'

(13) Initial Shortening (stem level):

Shortens a long, onsetless syllable when it is in verb stem-initial position.



(14) Empty C-initial verbs surface with a LONG vowel following the 1st sing. OP /N/: The empty C serves as the onset of the initial long vowel. Since the long vowel is not in stem-initial position, stem-level Initial Shortening is not applicable and the vowel remains long.

a. infinitive	/ko-Cóot-a/	ko.óòtá	'to dream'
b. 1st sing. OP form	/ko-N-Cóot-eC-a/	koondóote.à	'to dream for me'

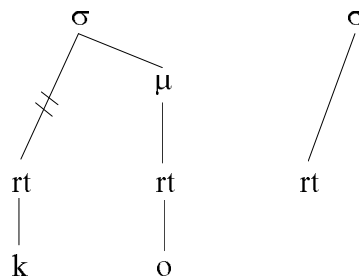
- (15) Further examples demonstrate the robustness of this contrast:  
 Vowel-initial verbs: vowel surfaces as short following the 1st sing OP /N/:
- |              |              |                     |
|--------------|--------------|---------------------|
| a. kwaambatà | koombambatyà | ‘cause me to go up’ |
| b. kweènà    | koombenze.à  | ‘dig for me’        |
| c. kwèènzá   | koombènzá    | ‘shave me’          |
| d. kóombá    | koombómbá    | ‘mold me’           |
- Empty C-initial verbs: vowel surfaces as long following the 1st sing OP /N/:
- |                  |                |                |
|------------------|----------------|----------------|
| e. ko.aandekà    | koonaandeké.à  | ‘write for me’ |
| f. ko.εèndà      | kooneεnde.à    | ‘go for me’    |
| g. ko.oonɔ̃gamyà | koonoonɔ̃gamyà | ‘stop me’      |

## §2 Evidence that empty Cs have been deleted

### 2.1 Prefix /k/-deletion

The /k/ in the prefix /ko/ deletes if the following syllable has an onset.

- (16) Prefix-/k/ deletion: post-vocalic, left-right, iterative



- [k] deletes in the 2nd sing. Object prefix /ko/

- (17) Vowel-initial verbs surface with [k], since after coalescence the structural description of Prefix-/k/ deletion is not met.

a. /ko-ko-ák-a/	kokwááká	‘to build you-sg’
b. /ko-ko-ón-a/	kokwóná	‘to see you-sg’

- (18) Consonant-initial verbs surface without [k], since the structural description of Prefix-/k/ deletion is met.

a. /ko-ko-tál-a/	ko.ótálá	‘to count you-sg’
b. /ko-ko-βálok-i-a/	ko.óβáloçà	‘to make you-sg fall’
c. /tó-káa-ko-tál-a/	toká.ótálá	‘we will count you-sg’

- (19) Empty C-initial verbs unexpectedly surface with [k], indicating that the structural description of Prefix-/k/ deletion is not met: the following syllable has no onset, supporting the claim that the empty C has deleted.

a. /ko-ko-Calyool-a/	koko.alyoòlà	‘to change you-sg’
b. /ko-ko-Cóot-eC-a/	koko.óote.à	‘to dream for you-sg’

- [k] deletes in the Cl.15 Infinitive prefix /ko/

- (20) Just as seen in (18-19), Prefix-/k/ deletion is not applicable in Vowel-initial verbs (a-b) and is applicable in Consonant-initial verbs (c-d). As in (20), Prefix-/k/ deletion is *unexpectedly* not applicable in Empty C-initial verbs (e-f).

V-initial verbs	C-initial verbs	Empty C-initial verbs
a. $\acute{n}\acute{e}\acute{m}\acute{a}k\acute{w}\acute{e}\acute{z}\acute{n}\acute{z}\acute{a}$ 'they are shaving'	c. $\acute{n}\acute{e}\acute{m}\acute{a}.\acute{o}\acute{t}\acute{a}\acute{l}\acute{a}$ 'they are counting'	e. $\acute{n}\acute{e}\acute{m}\acute{a}k\acute{o}.\acute{a}m\acute{o}k\grave{a}$ 'they are waking up'
b. $\acute{n}\acute{e}\acute{m}\acute{a}k\acute{w}\acute{a}\acute{a}k\acute{a}$ 'they are building'	d. $\acute{n}\acute{e}\acute{m}\acute{a}.\acute{o}\beta\acute{i}k\grave{a}$ 'they are arriving'	f. $\acute{n}\acute{e}\acute{m}\acute{a}k\acute{o}.\acute{e}\beta\grave{a}$ 'they are paying'

- [k] does NOT delete in the Cl.15 Object prefix /kó/

- (21) Prefix-/k/ deletion is a lexical rule, since it applies to some Object prefixes but not others. Therefore, Empty C deletion is a lexical rule, since Prefix-/k/ deletion applies after the empty C has been deleted.

a. /ko-ko-titiC-a/	ko. <u>o</u> titi.à	'to rub you-sg (2s)'
b. /ko-kó-titiC-a/	ko <u>k</u> ótiti.à	'to rub it /cl.15'
c. /ko-ko-βák-a/	ko. <u>o</u> βáká	'to rub/smear on you-sg(2s)'
d. /ko-kó-βák-a/	ko <u>k</u> óβáká	'to smear on it /cl.15'
e. /né-né-ko-ko-tál-aC-a/	né <u>ng</u> o. <u>o</u> tála.a	'I've counted you-sg(2s)'
f. /né-né-ko-kó-tál-aC-a/	né <u>ng</u> o <u>k</u> ótála.a	'I've counted it /cl.15'
g. /né-káa-ko-kon-a/	ngá. <u>o</u> konâ	'I will hit you-sg(2s)'
h. /né-káa-kó-kon-a/	ngá <u>k</u> á <u>k</u> ókonâ	'I will hit it /15'

## 2.2 Sequential shortening

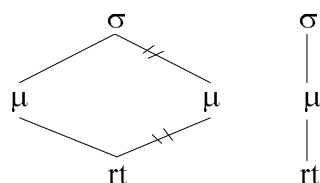
When a long vowel is immediately followed by another vowel, a rule of Sequential shortening shortens the long vowel. In order for such a rule to apply properly, the empty C must be deleted.

- (22) In (a,c), vowel coalescence has taken place, and a long vowel precedes the verb stem. In (b,d), the vowel surfaces as short before another vowel. Therefore, the empty C is transparent to the vowel shortening process: Sequential shortening applies at a point in the grammar after the empty C has deleted.

a. /né-tó-a-tál-á/	nét <u>w</u> áatálâ	'we just counted'
b. /né-tó-a-Cóm-á/	nét <u>w</u> á.ómâ	'we just bit'
c. /né-né-a-séεmb-aC-a/	néná <u>a</u> séεmba.â	'I always run'
d. /né-né-a-Cεnd-aC-a/	néná. <u>ε</u> nda.â	'I always go'

- (23) Sequential shortening (SS):

Shorten a long vowel if it is followed by an onsetless syllable.



(24) Further examples demonstrate the robustness of the SS phenomena.

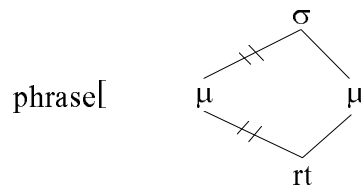
a. /ko-éC-a/	kwé.ǎ	‘to tell’
b. /né-mó-éC-éet-é̂/	némwé.éeté̂	‘you-pl told’
c. /né-né-éC-aC-á/	néné.a.â	‘I always tell’
d. /né-tó-éC-aC-á/	nétwé.a.â	‘we always tell’
e. /né-né-a-CeC-á/	néná.e.â	‘I just cried’
f. /né-tó-a-CoC-á/	nétwá.o.â	‘we just bought’
g. /ko-óCaC-a/	kó.a.à	‘to kill’

### 2.3 Initial shortening in the imperative

The initial long vowel of all phonetically vowel-initial verbs shortens in the imperative, demonstrating that the empty C has deleted.

(25) Initial Shortening (phrase level)

At the phrase level, an initial long vowel is shortened.



(26) Vowel-initial verbs: Initial shortening takes place at the phrase level.

a. /ko-óok-a/	kóókà	óka	‘come!’
b. /ko-ambat-a/	kwaambatà	ambáta	‘go up!’
c. /ko-enz-a/	kweènzà	enzâ	‘dig!’
d. /ko-énz-a/	kwéénzâ	énza	‘shave!’
e. /ko-ómb-a/	kóómbá	ómba	‘mold!’
f. /ko-ɔŋgel-a/	kwɔŋgelà	ɔŋgélá	‘increase!’

(27) Empty C-initial verbs: Unexpectedly, initial long vowels also shorten, indicating that Empty C deletion takes place by the word level.

a. /ko-Cóot-a/	ko.óòtâ	óta	‘dream!’
b. /ko-Candek-a/	ko.aandekâ	andéka	‘write!’
c. /ko-Cend-a/	ko.ɛèndâ	énda	‘go!’

### §3 Phonetic evidence for the presence and deletion of C

Duration measurements provide further evidence for the Empty C phenomena above.

(28) A heterosyllabic sequence of short vowels has greater duration than a monosyllabic long vowel. Difference in duration is the result of contrast in syllabification. Empty Cs account for this syllabification contrast by blocking syllable fusion.

(1) Monosyllabic vowel sequences	(2) Bisyllabic vowel sequences
/ko-má-aǎ-a/ komáaǎaǎ ‘govern them’	/ko-má-Caǎ-a/ komá.aǎaǎ ‘shoot them’
/ko-ké-ék-a/ kokééká ‘possess him (7)’	/ko-ké-Ceβ-a/ koké.eβà ‘pay him (7)’

(29)

Representation of vowel sequences	monosyllabic	bisyllabic
identical vowel sequences	V <sub>i</sub> V <sub>i</sub>	V <sub>i</sub> .V <sub>i</sub>
non-identical vowel sequences	V <sub>i</sub> V <sub>j</sub>	V <sub>i</sub> .V <sub>j</sub>

Identical vowels

V <sub>i</sub> V <sub>i</sub>	/ko-tó-óm-i-a/	kotóomyá	‘dry us’
V <sub>i</sub> .V <sub>i</sub>	/ko-tó-Cóm-a/	kotó.ómá	‘bite us’

Non-identical vowels

V <sub>i</sub> V <sub>j</sub>	/ko-má-óm-i-a/	komóomyá	‘dry them’
V <sub>i</sub> .V <sub>j</sub>	/ko-má-C-óm-a/	komá.ómá	‘bite them’

A bisyllabic short vowel sequence has significantly greater duration than a monosyllabic long vowel.

Figure 1: Durational contrast between a monosyllabic long vowel-VV and a bisyllabic vowel sequence-V.V

	duration	N		duration	N	p-value
a. V <sub>i</sub> V <sub>i</sub>	150 ms	194	V <sub>i</sub> .V <sub>i</sub>	214 ms	39	p < .001
b. V <sub>i</sub> V <sub>j</sub>	179 ms	25	V <sub>i</sub> .V <sub>j</sub>	211 ms	58	p < .001

(30) There is neutralization of vowel duration differences across a phrasal boundary for roots which underlyingly begin with an empty C (b,d) vs. those that begin with a vowel (a,c).

Identical vowels

a. V <sub>i</sub> #V <sub>i</sub>	Mweema aǎa	‘Mweema govern!’
b. V <sub>i</sub> #CV <sub>i</sub>	Mweema aǎa	‘Mweema shoot!’

Non-identical vowels

c. V <sub>i</sub> #V <sub>j</sub>	Mweema okita	‘Mweema fight!’
d. V <sub>i</sub> #CV <sub>j</sub>	Mweema oma	‘Mweema bite!’

There is no significant difference in vowel duration between empty C-initial verbs and vowel-initial verbs at the phrase level.





Word	Syllabification/Vowel Coalescence Excrescent consonant insertion (1sg.Object Prefix /-N-/) Lateral Spread <b><u>Empty C Deletion</u></b> Prefix /k/-deletion (2sg.Object Prefix, Infin. /ko/)
Phrase	Syllabification/Vowel Coalescence Sequential Shortening Initial Shortening (phrasal)

(33) The empty C is present at the stem level blocking Initial shortening, as in (a), and the empty C has deleted for the phrasal phonology allowing Initial shortening, as in (b).

a. /ko-N-Cóot-eC-a/	[koondóotε.à]	‘dream about me’
b. /Cóot-a/	[óta]	‘dream’

When Excrescent consonant insertion takes place, the empty C must be present to explain why a vowel-initial verb surfaces with [b] in (34a) and an empty C-initial verb surfaces with [d] in (34b). When Prefix-/k/ deletion takes place, the empty C must be deleted to explain why Prefix-/k/ deletion doesn’t apply in (35b).

(34) 1st SG OP form

	V-stem	Empty C-stem
	a. /ko-N-að-a/	b. /ko-N-Cóot-eC-a/
Excrescent consonant insertion	ko-N <b>ɓ</b> að-a	ko-N- <b>d</b> óot-eC-a
Empty C deletion	N/A	ko-ndóot-ε.-a
Prefix /k/ deletion	N/A	N/A
	[koomb <b>ɓ</b> aðà]	[koond <b>d</b> óotε.à]
	‘govern me’	‘dream about me’

(35) 2nd SG OP form

	C-stem	Empty C-stem
	a. /ko- <b>ko</b> -tál-a/	b. /ko- <b>ko</b> -Calyool-a/
Excrescent consonant insertion	N/A	N/A
Empty C deletion	N/A	ko <b>ko</b> .alyoola
Prefix /k/ deletion	ko.otála	N/A
	[ko.ot <b>á</b> l <b>á</b> ]	[ko <b>ko</b> .alyo <b>ò</b> l <b>à</b> ]
	‘count you-sg’	‘change you-sg’

#### 4.2 An Optimality Theoretic account of empty Cs

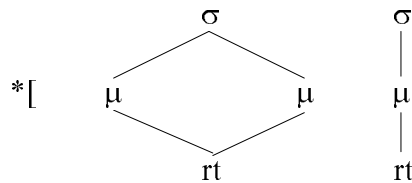
A monostratal approach obeying containment is not capable of simultaneously maintaining and eliminating the distinction between hiatus-maintenance and hiatus resolution. Thus, we use Correspondence Theory to allow deletion and adopt a multistratal account to emulate extrinsic ordering to account for the Kikamba data.

- Sequential shortening and Vowel Hiatus

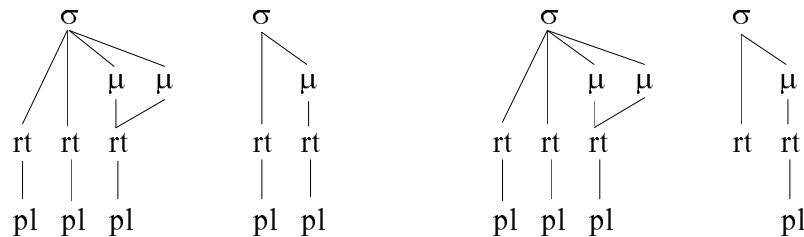
In a monostratal account, both the assumption that the empty C is parsed and unparsed are problematic.

(36) A long vowel may not precede an onsetless syllable.

\*Long vowel + Onsetless syllable



(37) If the empty C is parsed, it serves as the syllable onset and there is no motivation for syllable fusion in (b). However, there is also reason why Sequential shortening should occur in (b): with the empty C parsed as an onset, the structure should not violate the constraint in (36).



/ne t o a t a la/

a. [nétwáatáá]̂

verb stem /-tál/ ‘count’  
‘we just counted’

/ne t o a C o ma/

b. [nétwá.ómá]̂

verb stem /-Cóm/ ‘bite’  
‘we just bit’

(38) If the empty C is not parsed, Sequential shortening takes place in (b); but we cannot explain why coalescence does not occur between /a/ and /Cóm/.

a. /ne-ne-a-om-aC -a/

[néńóma.â]̂

verb stem /-óm/ ‘dry’  
‘I’m always dry’

b. /ne-ne-a-<C >om-aC-a/

[néńá.ómá.â]̂

verb stem /-Cóm/ ‘bite’  
‘I always bite’

(39) Thus, a parsing paradox results: the empty root node needs to be parsed to explain vowel hiatus, but unparsed to explain Sequential shortening. A multistratal

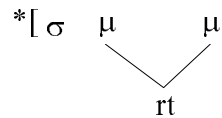
account handles these facts by allowing the level at which the empty C is ‘present’ to choose as the optimal candidate one in which the underlined vowels in (a) are not coalesced; and the level at which the empty C is not ‘present’ to choose as the optimal candidate one in which an underlying long vowel surfaces as short before an onsetless syllable, as in (b), demonstrating the need for deletion and the notion of before and after.

	(a)	(b)
	output of 1st level	output of 2nd level
/né-né-á-Cóm-aC-a/ →	nena <u>a</u> o <u>ma</u> .a →	né <u>ná</u> .ó <u>ma</u> .â
/né-tó-á-Cóm-a/ →	netwaa o <u>ma</u> →	nétwá.ómâ

● Initial shortening: A Monostratal account

- (40) Problems with a monostratal account of Kikamba Initial shortening
- The empty C cannot be simultaneously parsed and unparsed.
  - The correct form of vowel-initial verbs cannot be generated.

- (41) The initial mora of a long vowel is not parsed if the syllable is onsetless.  
No Long Vowel Constraint (NLV):



- (42) The empty C is parsed in (a) the stem level; but unparsed in (b) the phrase level.

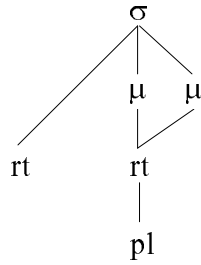
a. /ko-N-Cóot-eC-a/	[koondóote.à]	‘to dream about me’
b. /Cóot-a/	[óta]	‘dream!’

- (43) If the empty C is unparsed, we incorrectly predict a short vowel to surface after the 1st singular Object prefix /N/, as in (a).



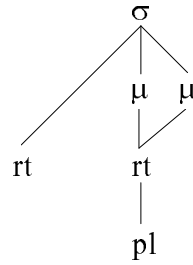
koN	C	o	t	a	C	o	t	a
a. *[koondóte.à]					b. [óta]			
‘to dream for me’					‘dream’			

- (44) If the empty C is parsed, we incorrectly predict a long vowel to surface in the imperative, as in (b).



koN C ɔ t a

a. [koodɔtɛ.à]  
‘dream for me’

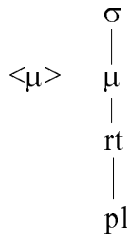


C ɔ t a

b. \*[ɔta]  
‘dream’

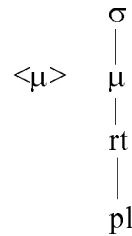
The parsing paradox is seen in (44b). A monostratal account requires the empty C, which is both stem- and word-initial, to be parsed and unparsed simultaneously.

- (45) Initial shortening explains why both (a) and (b) surface with a short stem vowel /a/. However, in a monostratal account, the stem-initial syllable of (45a) has an onset: /mb/. Therefore, (45a) should not violate (41): we incorrectly predict that (45a) should surface with a long vowel.



koN a ða

a. [koombãðà]  
‘to govern me’



a ða

b. [ãðâ]  
‘govern!’

● Initial shortening: A Multistratal account

Assuming a multistratal version of OT will allow the empty C to be present for earlier phonology and deleted later at the interface of levels.

Derivational Residue: Deletion

To handle Kikamba, we allow parsed elements without phonetic content to be deleted at the end of one, specified level. Such deletion is allowed in Correspondence theory, which abandons containment. The constraints MAX and \*SILENCE are needed.

- (46) MAX: Everything present in the input must be present in the output.  
\*SILENCE: Segments may not lack phonetic output.

- (47) In strata where MAX dominates \*SILENCE, empty Cs will be preserved.

Level <sub>i</sub>: C is present at the stem level, MAX, ONS >> \*SILENCE

/ Cɔɔt-a/	MAX	ONS	*SILENCE
ɔta	*!	*	
☞ Cɔɔta			*

- (48) In strata where \*SILENCE dominates MAX, the syllabified empty C is deleted.

Level <sub>j</sub>: C is not present at the phrase level, \*SILENCE >> MAX, ONS

σ σ	*SILENCE	MAX	ONS
/ Cɔɔt-a/			
☞ ɔta		*	*
Cɔɔta	*!		

### Derivational Residue: Ordering

The fact that empty C-deletion is ‘ordered’ between levels requires a multistratal account.

- (49) Level 1 - stem

Initial Shortening of onsetless syllables

Level 2 - word

Excrescent consonant insertion

(insert /d/ if there is an empty C, otherwise insert /b/)

**Empty C deletion**

Prefix /k/-Deletion (2sOP, infinitive prefix)

Level 3 - phrase

Initial Shortening of onsetless syllables

- (50) A multistratal approach predicts that, throughout a given level, a segment should behave consistently as though it is or is not present. However, (49) shows that the empty C is deleted in the middle of a level. Therefore, a constraint-based approach bifurcates the word level into two separate word levels, in order to encode the distinction between phenomena which respect and ignore the empty C.

STEM ONS, MAX >> \*SILENCE

WORD LEVEL 1 ONS, MAX >> \*SILENCE

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WORD LEVEL 2 \*SILENCE >> ONS, MAX

PHRASE \*SILENCE >> ONS, MAX

The purpose is to emulate extrinsic rule ordering: in Word level 1 where the empty C is present, MAX dominates \*SILENCE. In Word level 2 where the empty C is not present, \*SILENCE dominates MAX.

However, this split does not correspond to a natural morphological split. The split forces the 1st singular Object prefix phonology to take place in Word level 1 where empty Cs are retained, but forces the reduction of the 2nd singular Object prefix /ko/ to take place in Word level 2, where empty Cs have been deleted. Thus, the problem with a multistratal, constraint-based approach is that we are forced to posit levels that are not independently justified in the language.

## §5 Conclusions

(51) (a) Kikamba provides both phonological and phonetic evidence for empty Cs.

(b) In a derivational account, the empty C deletes after some rules, and before others, which indicates that ordering and deletion are crucial to accounting for the Kikamba vowel hiatus facts.

(c) Recent changes to Optimality Theory, such as Correspondence Theory allows there to be deletion of the empty C, but still leaves us with the undesirable result that levels are postulated for the sole purpose of providing a level for the empty C to delete. This constitutes a weakening of a constraint-based theory, unless there is a way to constrain the theory from postulating otherwise unnecessary levels which are not independently justified in a language.

## §6 References

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