A Phonological Reanalysis of Morphological Segment Deletion and De-affrication in Ik

1 Introduction

The kind of patterns that are handled in this paper are of the type: 'process x happens uniquely with items x, y, z... only across morpheme boundaries (root + Nominative or Instrumental).

1.1 The Language

Ik is a Kuliak language spoken by approximately 7,500 people on a 50/1km strip between Kenya and Uganda.

	Labial	Alveolar	Lateral	Palatal	Velar	Glottal
Stop	p, b	t, d			k	
Implosive	ɓ	ɗ		ʄ		
Ejective		ts'			k'	
Affricate		ts, dz		tʃ, dʒ		
Fricative	f	s		ʃ		h, ɦʲ
Nasals	m	n		ɲ	ŋ	
Liquid		r	l			
Glides	w			j		

2 The pattern

In (3) the noun 'dog' is found in the Nominative case and it is pre-pausal (‖) (which I will call 'domain'). Its shape is different to when it is found before any other linguistic element (non-domain-final).

(3) Final vs. Non-Final allomorphy 'dog-NOM'

a. Final version

ep-a	**ŋók-ᵃ ‖**	
sleep.3SG-REAL	dog-NOM	'the dog is asleep'

b. Non-Final version

áts'-á	**ŋók-á**	ɔká-ka ‖	
gnaw.3SG-REAL	dog-NOM	bone-ACC	'the dog is gnawing the bone'

(4) Final vs. Non-Final allomorphy

a. Final version (Schrock 2014:525, partial example)

tawán-á-a	ɲɛɗɛkɛ-a	**imá-kᵃ ‖**	
harm-REAL-PRF	illness-NOM	child-ACC	'Illness is harming my child'

b. Non-Final version

wet-it-uk'ót-u-o	**imá-á**	tʃɛmɛrɪ-kɛ ‖
drink-CAUS-COMP-3SG-SEQ	child-ACC	herb-DAT

(5) Ik case allomorphy (Schrock 2014:241)

/ŋókí/ ‘dog’

Case	Non-Final	Final
a. OBL(ique)	ŋókí	ŋók^{i}
b. NOM(inative)	ŋók-á	ŋók-^{a}
c. INS(trumental)	ŋók-ó	ŋók-^{o}
d. ABL(ative)	ŋókú-o	ŋókú-Ø
e. GEN(itive)	ŋókí-e	ŋókí-Ø
f. DAT(ive)	ŋókí-e	ŋókí-k^{e}
g. ACC(usative)	ŋókí-a	ŋókí-k^{a}
h. COP(ulative)	ŋókú-o	ŋókú-k^{o}

2.1 Vowel devoicing/deletion

Vowel devoicing in Ik is a highly distinctive aspect of its phonology. Unlike in the neighbouring Turkana language where vowel devoicing is synchronically contrastive (Dimmendaal 1983), in Ik all vowels in final position devoice[1] and conversely all vowels in non-final position are voiced.

(6) Devoicing (Schrock 2014:51)

a.	/rébe/	[rêp^{e}]	‘finger millet’
b.	/édi/	[êt^{i}]	‘name’
c.	/sega/	[sèk^{a}]	‘umbrella thorn’
d.	/moriɗo/	[mòrìɗ^{o}]	‘beans’
e.	/emé/	[ēm̥]	‘meat’
f.	/wɛla/	[wɛ̀l̥]	‘opening’
g.	/baro/	[bàr̥]	‘herd’

(7) Vowels in Final positions after stops (Schrock 2014:53)

a.	/rébe/	[rêp^{e}]	[rêp̚]	‘finger millet’
b.	/édi/	[êt^{i}]	[êt̚]	‘name’

Final vowels of hiatus roots are devoiced in the Final context. If the two vowels are identical, the devoiced vowel is simply inaudible, while if the vowels are underlyingly different the devoiced vowel survives as a bit of devoicing/aspiration.

[1] In fact, there are a few syntactic contexts where apparently final vowels don’t devoice, but there are clearly circumscribed in context, and could result from not being truly final (phonologically).

(8) Hiatus roots in Final context

a.	/didì.ì/	[dìdì]	‘rain’
b.	/ɗóɗo.o/	[ɗóɗò]	‘sheep’
c.	/ŋk’wa.á/	[ŋk’wāʰ]	‘traditional healer’

2.2 Morphological Consonant-Zero Alternation

(9) Consonant deletion

a. Case allomorphy (repeated from (5))

		UR	**Final**	**Non-Final**
i.	DAT(ive)	ke	ŋókí-k	ŋókí-e
ii.	ACC(usative)	ka	ŋókí-k	ŋókí-a
iii.	COP(ulative)	ko	ŋókú-k	ŋókú-o

b. Other consonant deleting items (the vowel changes are due to assimilation)

i.	ADV	=ʃɪke	=ʃɪk	=ʃɪ.ɪ
ii.	DP	=́dɛ	=́t	=́ɛ
iii.	PRF	ˊka	ˊk	ˊa
iv.	PST2	=batse	=bats	=bɛɛ

c. Dummy Pronoun (DP) as example

i. Dummy Pronoun

ats-	iní	=**i**=	kot	
come-	SEQ	=DP=	then	‘they came with it’

ii.

ńt-á	k’a-í-	íí=**t** ‖	
NEG-REAL	go-PL-1.SG=DP		‘I don’t go there regularly’

Every instance of this C-deletion is complementary with an instance of vowel deletion/devoicing.

(10) Complementarity between V deletion/devoicing and C deletion

a. Final

ɪɓɛ́ɓɛ́-ʊk’ɔt-á-**k**
lay.eggs-COMP-REAL-PRF

b. Final

dakú-k
tree-ACC

b. Non-Final

buan-uk’ot-á-**á** ínu̯
disappear-COMP.3.SG.REAL.PRF animal.NOM

b. Non-Final

dakú-á (or dakwáá)
tree-ACC

3 Strict CV analysis

Explanation of the complementarity of the processes of V devoicing and C deletion.

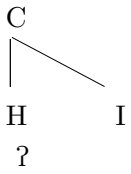
Why C deletion only happens in some items, without having an item-dependent phonology (lexically-indexed constraints and a morpheme-specific phonology (Pater 2007).

Why some cases (NOM/INS) overwrite the root-final vowel while others do not. The proposed explanation should fit the fact that only non-overwriting affixes have C deletion.

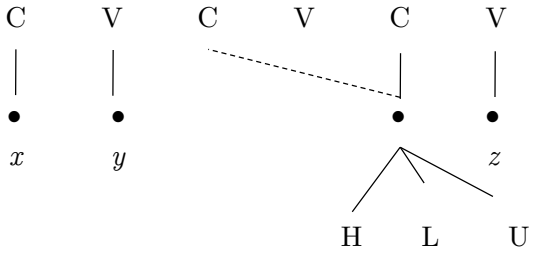
3.2.3 The segment in Strict CV

Although not usually acknowledged, there is mounting evidence that there is a segment node in Strict CV representations. These are implicitly handled in (Enguehard & Luo to appear) where their model seems to rely on features either adjoining or fusing to positions. This distinction between 'fusion' into the 'core' of the segment, as opposed to a position adjoining it also seems implicit in the representation of Kula (2006; 2008).

(14) Derived palatalization as adjoined to the 'core' (not within it)



(15) **Spreading/Gemination** and spreading (C_x becomes C_x**:**)



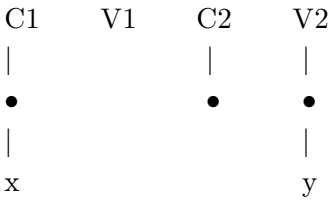
'root and pattern' morphology (McCarthy 1981). If this is taken to be generatively productive (Faust *to appear*), it implies that the roots are stored as a series of ordered segments (ibid.). In cases such as this, melodic features must be grouped together at least at the level of the root node, not the skeleton, because the **roots do not encode consonant length**.

(16) √ktb = k → t → b katab, kattib, katabu...

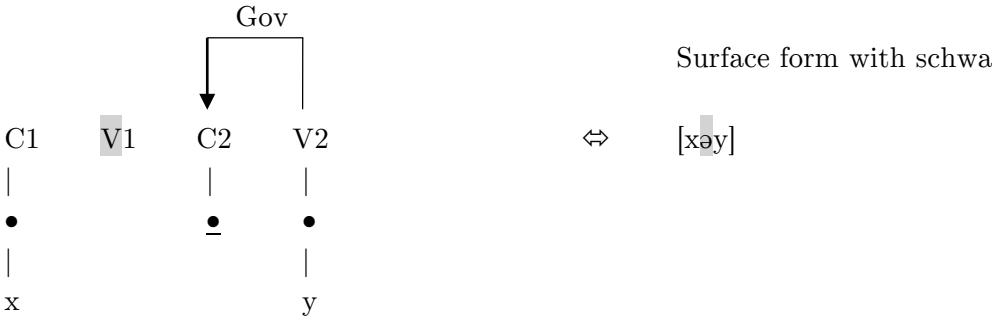
H-aspiré in French (Charette 1991), not all vowel-initial words behave like vowel-initial words: /l+ami/ > [lami] vs. /lə+ero/ > [l**ə**ero]. Pagliano (2003) proposes an underlying glottal stop in h-aspiré roots, however, this glottal stop is completely optional.

(17) Pointed onsets and government

a. UR with pointed onset (C2)

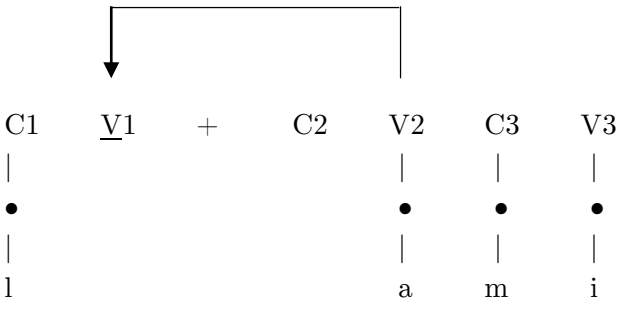


b. Computed form (non-silenced empty positions are grey-shaded (V1), silenced positions are underlined (C2))

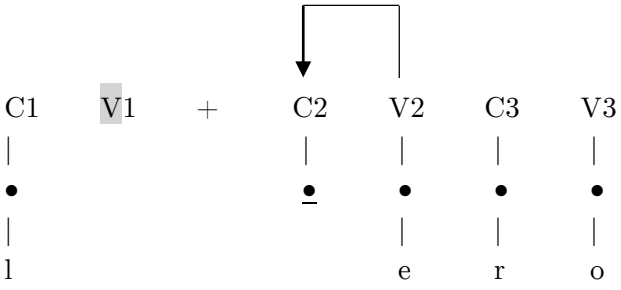


(18) H-aspiré with initial Seg node

a. /l + ami/ > [lami]



b. /lə + ero/ > [l~~ə~~ero]



4 Floating Segments, vowel devoicing and C deletion in Ik

(19) Ik case allomorphy /ŋókí/ ‘dog’ (Schrock 2014:241)

a. No changes

Case	Non-Final	Final
OBL	ŋókí	ŋók^{i}

b. Overwriting root-final vowel

NOM	ŋók-á	ŋók-^{a}
INS	ŋók-ó	ŋók-^{o}

c. No overwriting root-final vowel

ABL	ŋókú-o	ŋókú-Ø
GEN	ŋókí-e	ŋókí-Ø

d. No overwriting and morphological c-deletion

DAT	ŋókí-e	ŋókí-k^{e}
ACC	ŋókí-a	ŋókí-k^{a}
COP	ŋókú-o	ŋókú-k^{o}

4.1 No change, OBL

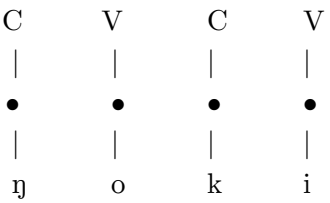
The OBL is marked by no regular changes in the root. I assume that OBL spells out no vocabulary item.

(20) OBL ⇔ Ø

As is phonologically regular, Domain-final devoicing (DFD) applies to the final CV of the root (see 21b). The final vowel will be referred to as FN (final nucleus).

(21) /ŋókí + Ø ‖/ OBL ‘dog’ (Final)

a. UR of root



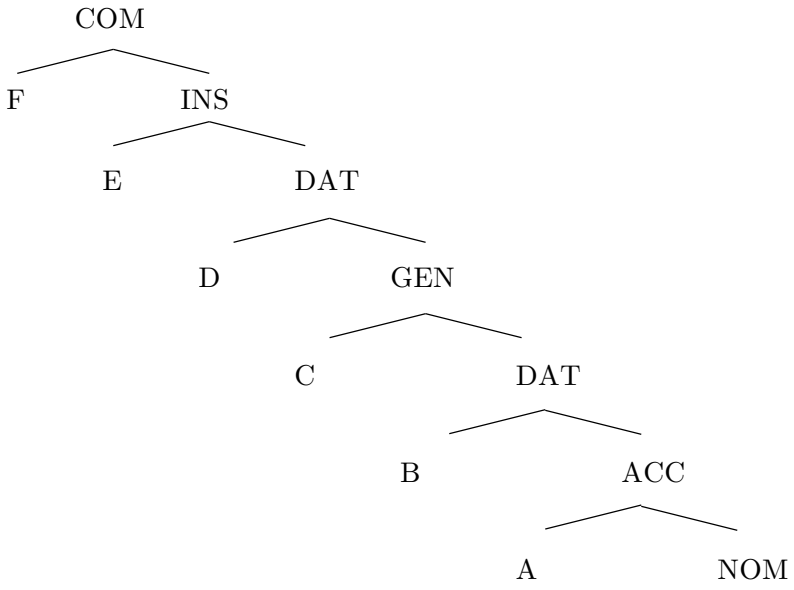
b. Computed form (the FN is shown to be 'silenced'-devoiced, the /i/ is greyshaded)

C	V	C	V	DFP
•	•	•	•	
ŋ	o	k	i	

4.2 Overwriting affixes

There is no syntactic reason to expect INS to be closer to root than other cases.

(22) Case hierarchy (Caha 2009:24)



NOM and INS have floating segment exponents. The Seg node symbol (•) linearly symbolises exponents that are made up only of the Seg node and melodic features (cf. Newell *under review*).

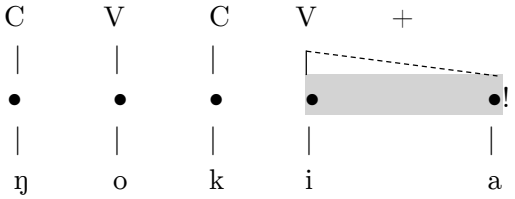
(23) NOM ⇔ a•
INS ⇔ o•

(24) Overwriting segment-case affixes

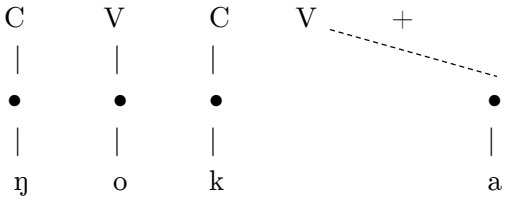
a. UR /ŋókí + a•/ 'dog + NOM' (Non-Final)

C	V	C	V	+	
•	•	•	•		•
ŋ	o	k	i		a

b. Linking Floating segment triggering OCP



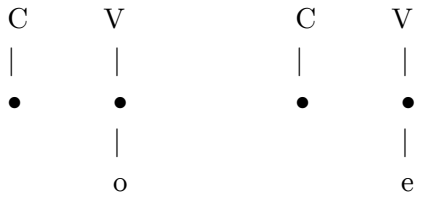
c. Deleting Seg (OCP) Output: [ŋóká] ‘dog.NOM’ (Non-final)



The derivation of the INS is exactly analogous, except that its UR is /e•/.

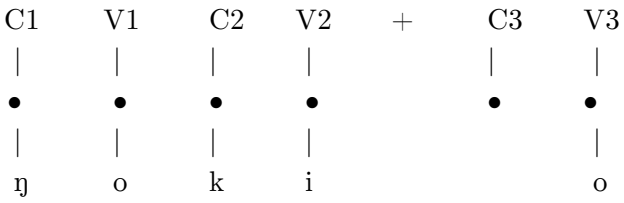
4.3 Non-Overwriting affixes without C-deletion

(25) a. UR of ABL b. UR of GEN

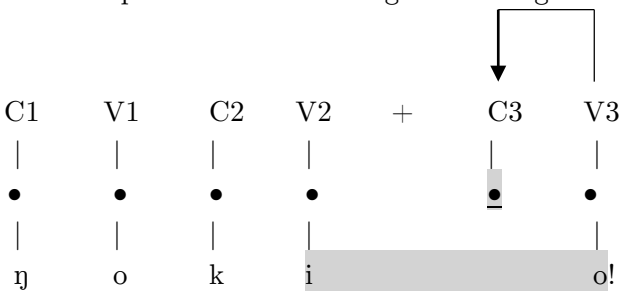


(25) Non-overwriting non-consonant deletion segments

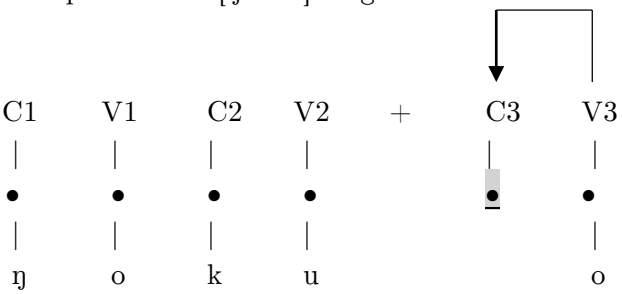
a. UR /ŋókí + o/ ‘dog + ABL’ (Non-Final)



b. Gov the pointed onset and segment change

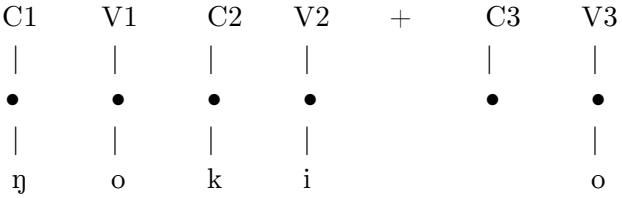


c. Computed form [ŋókúo] ‘dog-ABL’

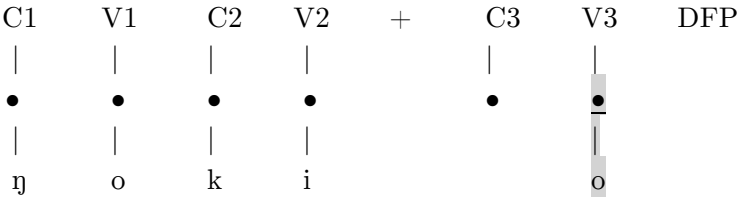


(26) Non-overwriting non-consonant deletion segments

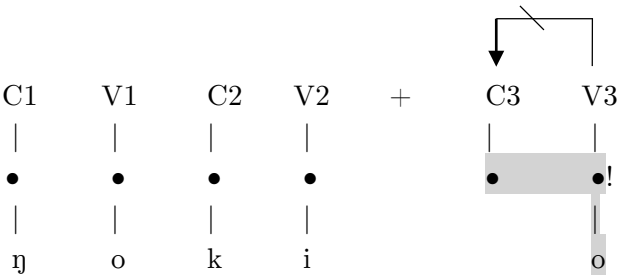
a. UR /ŋókí + o ‖/ ‘dog + ABL’ (Final)



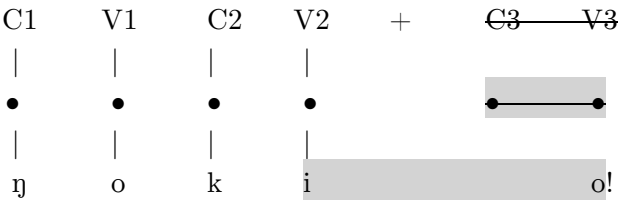
b. FN is silenced by the DFP



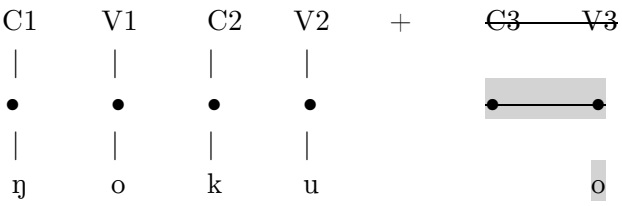
c. C3 cannot be Gov’d leading to ECP



d. Final CV deletion and segment change



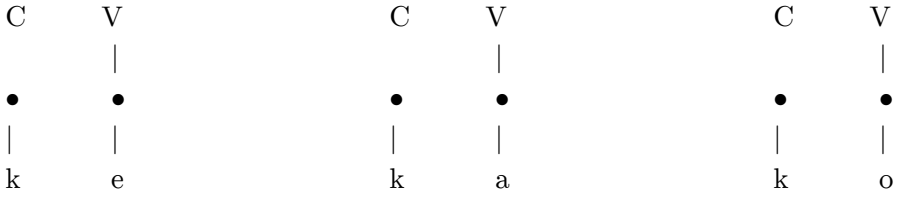
e. Computed form [ŋókú] (presented as ŋókú-Ø in Schrock 2014:241)



4.4 Non-overwriting cases with C-deletion

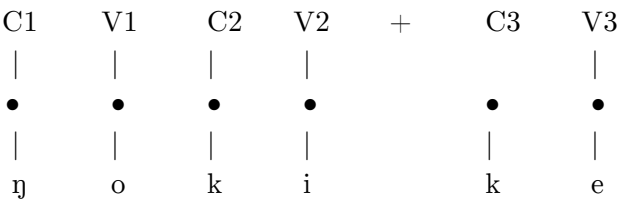
C-deletion is morpheme-specific (it's usually /k/ but affects /ts/ also: -batse > -bɛː 'PST2').

(27) a. DAT b. ACC c. COP

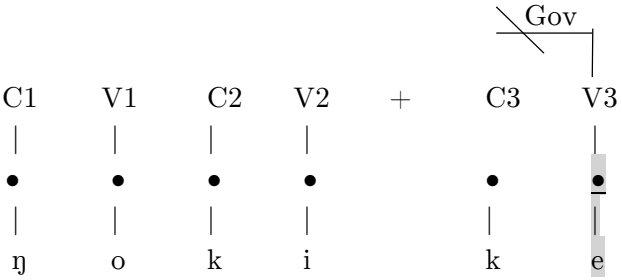


(28) Non-overwriting cases with C-deletion in Final position

a. UR /ŋókí + <k>e ‖/ 'dog + DAT' (Final)

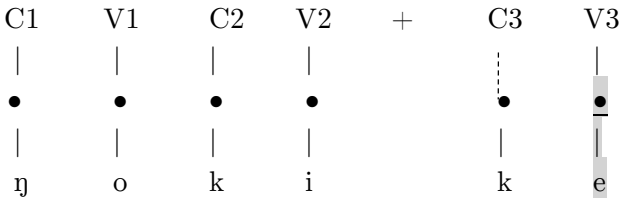


b. FN is Silenced by DFP *inhibiting* its ability to Gov C3



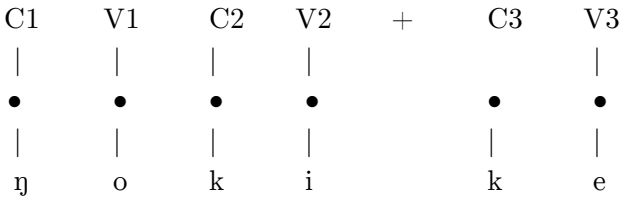
c. C3 cannot be silenced, so it must be phonetically interpreted

Computed form: [ŋókík͡e] ‘dog.DAT’ (Final)



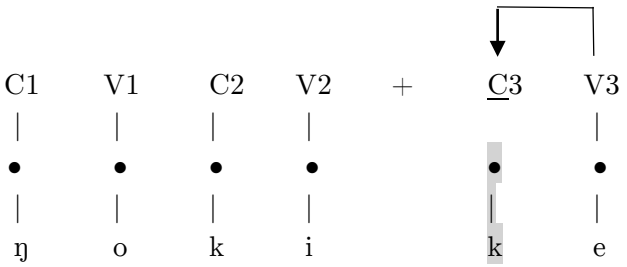
(29) Non-overwriting cases with C-deletion in Non-Final position

a. UR /ŋókí + <k>e ‖/ ‘dog + DAT’ (Non-Final)



b. V3 Governs C3 stopping it from being a good hosting site for the floating C

Output: [ŋókíe] ‘dog.DAT’ (Non-Final)



5 Consequences for the analysis on De-Affrication

This process is a prime case study for the success of a purely phonological approach to these ‘morpho-phonological’ phenomena because de-affrication only occurs with certain lexical items and only at a certain morphological juncture before two case affixes (and none of the others).

(30) De-affrication

a. Case allomorphy (/witʃé/ child)

	Non-Final	Final
OBL	witʃe	witʃ͡e
NOM	**wika**	**wik͡ᵠ**
INS	**witʃo/wiko**	**witʃᵠ/wikᵠ**

ABL	witʃóó	witʃéᵍᵒ
GEN	witʃéé	witʃé
ACC	witʃéá	witʃékᵃ
DAT	witʃéé	witʃékᵉ
COP	witʃóó	witʃékᵍᵒ

b. /ɲtʃi-/ ‘I’

OBL	ɲtʃi
NOM	**ɲk-a**
INS	**ɲk-o**
ABL	ɲtʃu-o
GEN	ɲtʃi-e
ACC	ɲtʃi-a
DAT	ɲtʃi-e
COP	ɲtʃu-o

(31) De-palatalisation and overwriting from/witʃé/ (Schrock 2017:506)

a. Overwriting:	wi**k**-ini	‘their children’ (cf. tát**àà** vs. tát**a**íní ‘aunt/1P.POSS’)
b. Non-overwriting:	wi**tʃé**nánèsì	‘childhood/childishness’ (Schrock 2017:270)
	wi**tʃe**=ni	‘these children’ (Schrock 2014:459)

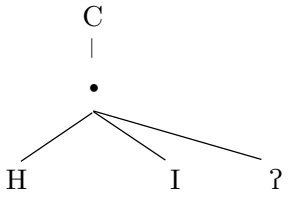
The second observation is that de-affrication is also characterised by ‘de-palatalisation’.

(32)

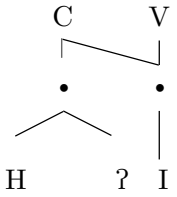
|H, ʔ|•	⇔	k
|H, ʔ, I|•	⇔	tʃ
|H, ʔ|• |I|•	⇔	tʃ (alternating)

(33) Alternating vs. non-alternating affricate

a. Non-alternating affricate



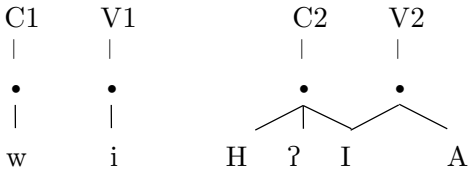
b. Alternating affricate



5.3 De-affrication and overwriting

(34) De-palatalisation with overwriting affixes

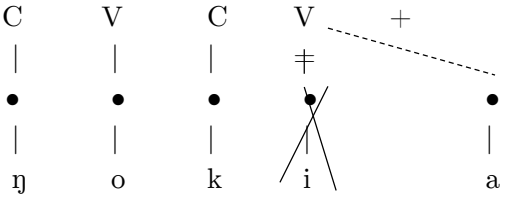
a. UR of /witʃé/ (shown in Element Theory)



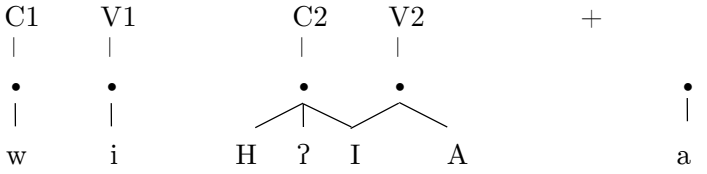
(35) Overwriting and de-palatalisation

a. Overwriting (vocalic root node OCP deletion)

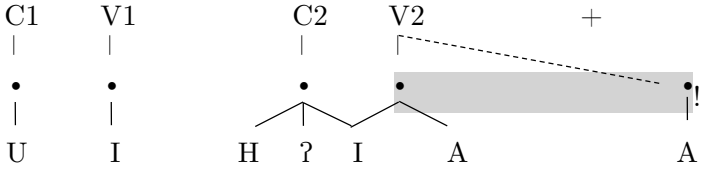
/ŋóká + a•/ > [ŋóká] 'dog.NOM' (Non-final)



b. UR of /witʃé + a•/ 'dog-NOM' (Non-Final)

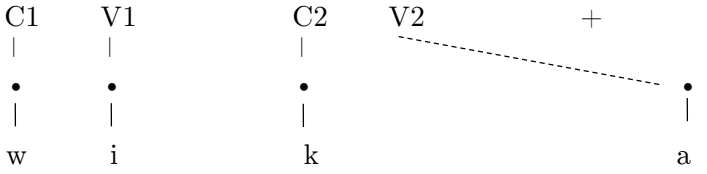


c. Vocalic OCP



d. Deletion of leftmost vocalic Seg node (and all the features beneath it)

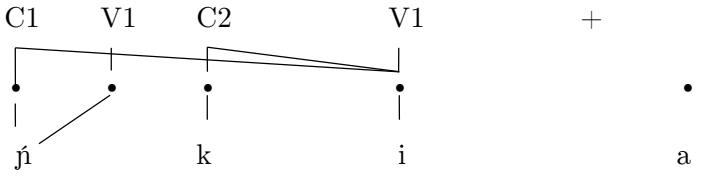
Output: [wika] 'dog.NOM' (Non-final)



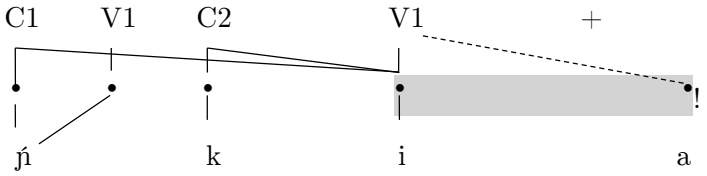
The derivation shown in (35) applies identically for the de-palatalisation of the first person pronoun, moreover, it explains (in one step) the fact that its preceding nasal loses palatalization.

(36) De-palatalisation of the nasal in the first person pronoun

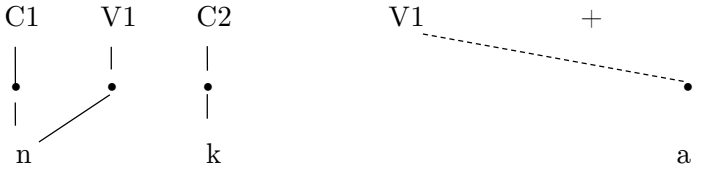
a. UR /ɲtʃi-a/ ‘I-NOM’



b. OCP, Seg node deletion



c. Output (no palatal feature) [ŋk-a] ‘I-NOM’



Speakers who have lexicalised ‘children’ with this purely consonantal affricate will not undergo de-affrication (for that lexical item), hence accounting for the variation: ‘child-INS’ wi**tʃo**/wi**ko** (Non-Final) & wi**tʃ˚**/wi**k˚** (Final). However, despite the variation, de-affrication never occurs in any token that does not also contain overwriting, confirming the analysis in (35-36).

We do not expect to get any ‘de-affrication’ before non-overwriting case exponents. This is because those affixes come with their own syllable structure, including an empty consonantal Seg node.

The fact that all this surface variation is possible from unique underlying forms should encourage others to pursue similar analyses. What is currently missing is a careful and full typology of all the possible morphological segment-zero types of alternation, the first step of which will be a series of language case studies of these phenomena.