On de-affrication in Modern Georgian*

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1. Introduction

In this paper we describe and analyse the facts of de-affrication in Western Georgian dialects. Traditionally, a number of issues are relevant in the discussion of the phonological structure of complex segments such as affricates: among these are, first, the question of whether the affricates truly function as a single segment from the viewpoint of the synchronic phonology. We will see that there is no doubt that affricates function as single segments in the dialects under discussion. The second question concerns the relationship between features denoting manner and those denoting place: if affricates consist of two parts, with different manner characteristics (an occlusion followed by a frication phase), how are these manner characteristics linked up to place features: do the manner features have separate place specifications, is only one of them specified for place, and, if so, how is this relation characterised? Finally, the nature of the place and manner features is at stake: is a binary feature [±continuant] suitable for the purpose (Sagey 1986), or, as has been suggested by various researchers, a sequence of two monovalued features [stop] and [cont]? The implication of the latter proposal is that the two parts of the affricate are not autosegmentally ordered vis-à-vis one another. In this paper, we will adopt the representations in (1) of affricates and comparable consonants, informed by such sources as Lombardi (1990), Humbert (1995), and van de Weijer (1993, 1996), among others:

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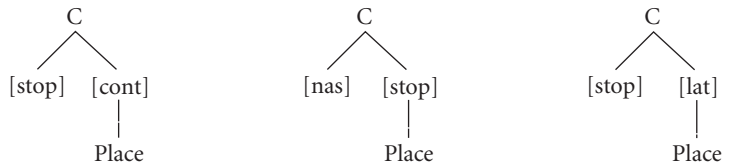
(1)



	affricates	pernasalised stops	lateral affricates
e.g.	/tʃ/	/mb/	/tɬ/

In these representations, two manner features are attached to a single root node (itself assumed to consist of a single feature [consonantal]), the first of which carries no place specification (accounting for the impossible contrast between, say, /tʃ/ and /pʃ/ as single segments), and the second does bear one or more place features. Similar representations can be proposed for prenasalised stops and lateral affricates; we refer to the sources mentioned above for further discussion.

In this paper we will discuss some aspects of the behaviour of affricates in Georgian, focusing especially on the western dialects of this language, such as Imeruli and Acharuli. In these dialects, as well as in the standard language, the following affricates occur, given both in conventional transliteration as well as IPA transcription:

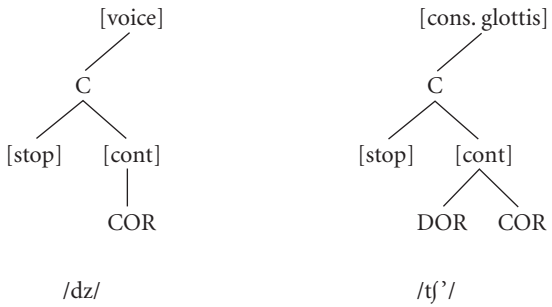
(2)

	voiced	**voiceless**	**glottalized**
alveolar	j [dz]	c [ts]	c’ [ts’]
palato-alveolar	ǰ [dʒ]	č [tʃ]	č’ [tʃ’]

Thus, affricates appear at two places of articulation, and in three laryngeal qualities. For further discussion of the Georgian consonant system, see Vogt (1958), Butskhrikidze (in progress).

Sample representations of two of the Georgian affricates making use of the representations in (1) are given in (3):

(3)



Here two assumptions are made, which are not crucial to the analysis to be developed below: (i) laryngeal features are unary, and are attached to the root node; thus, voiceless affricates have no laryngeal specification, voiced affricates have [voice] and voiceless glottalised affricates have [constricted glottis]; (ii) coronal affricates are specified with a CORONAL node, while palato-alveolar affricates have both a CORONAL and a DORSAL place specification (following, for instance, Keating 1988 for palatals, Jacobs & van de Weijer 1992 for palato-alveolars, among others). It would also be possible to leave the coronal place of articulation unspecified, following much other recent work. We note, however, that Georgian has a constraint against adjacent coronal consonants (Butskhrikidze, in progress), which can only be expressed if it assumed that CORONAL is specified underlyingly.

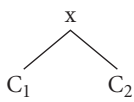
In this paper, we first look into the single-segment status of the affricates. Then we examine a de-affrication process which occurs in western dialects of the language, and point out parallel processes in other, unrelated languages. We will show that the analyses that have been proposed for those processes, based on OCP conditions on [±cont], do not carry over directly to the Georgian facts. We then explore an alternative analysis of the West-Georgian facts, based on the idea that the dialects do not allow a combination of complexity on the segmental level with complexity on the syllabic level, an analysis which receives independent support from other deletion and insertion processes.

2. Affricates as single segments

There are two main reasons not to mistrust the traditional insight that affricates are single segments in Georgian and its dialects. The first is that affricates are part of 'harmonic groups' parallel to regular segments just like in Modern Georgian.[1] Harmonic groups involve a type of complexity not captured by the representations in (1) above. We propose that harmonic groups involve complexity at an even

higher level, that between timing slots and root node tier (van de Weijer 1996: Ch. 10). This representation is given in (4):

(4)



Timing slot

Root nodes

In such a representation, C_1 and C_2 can be simple segments (b͡g) or affricates (c̆͡k) or even involve a consonant with secondary articulation (c̆͡kʷ). In both the two last cases, C_1 is the affricate č. If all these parts of harmonic groups, including affricates, are segments under single C-nodes, all harmonic groups can be represented as in (4).[2]

The second reason to regard affricates as single segments is that they behave in a parallel fashion to single segments in reduplication. Single segments may reduplicate (5a), and so may affricates (5b) and harmonic groups (5c), whereas regular clusters do not reduplicate (5d) (data from Gachechiladze 1976).

(5)	a.	k'ir-k'il-i	'sound of river water flowing'	
		ɣom-ɣoma	'type of fish'	
		pam-pali	'fluctuation'	
	b.	c'ak'-c'ak'-i	'to wander'	
		muč'a-muč'ala	'the name of the game'	
	c.	pac͡xa-puc͡x-i	'quick departure'	
		rac͡ʔk'a-ruc͡ʔk'-i	'to tinkle'	
	d.	rguli	'young plant'	(no reduplicated form)
		mk'at'i	'mould'	(no reduplicated form)

Since non-suspect clusters (5d) do not reduplicate, affricates, like harmonic groups, should be grouped with the single segments.

3. Dialectal de-affrication

In this section we consider a process of de-affrication that occurs in Western dialects of Georgian, such as Imeruli and Acharuli.[3] Data are from Žgenti (1956: 237). In the de-affrication process, an affricate is realised as a stop (6a) (usually after a fricative, but also in other contexts), or as a fricative (6b) (usually before a stop but also in other contexts):[4]

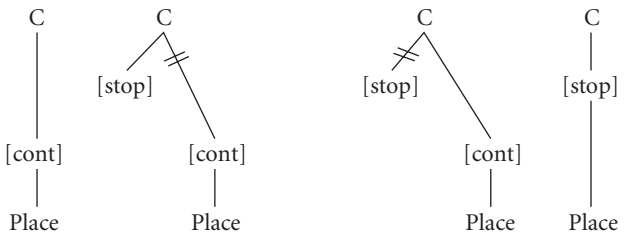
(6)		**Std. Georgian**	**Imeruli**	
	a.	sc'o.r-i	st'o.r-i	'right'
		sc'av.l-a	st'av.l-a	'to study'
		sc'ra.p-i	st'ra.p-i	'quick'
		d.ɣe-.sas.c'a.u.l-i	dɣe.-sast'a.u.l-i	'celebration'
		k'in.c'l-o.b-a	k'in.t'l-o.b-a	'to sting'
		a.-k'a.č'r-e.b-a	a.-k'a.t'r-e.b-a	'start of fading'
	b.	da.-ǰd-o.m-a	da.-žd-o.m-a	'to sit'
		o.c-da.-at.-i	o.z-da.-at.-i	'thirty'
		mo.-brjan.d-i	mo.-brzan.d-i	'welcome'
		ga.-pu.č'-d-a	ga.-pu.št'-a	'got spoiled'
		da.-beč'd-a	da.-be.št.a	'sb. printed'
		ga.-a.čnd-a	ga.-a.št-a	'possessed'
		nij.la.v-i	niz.la.v-i	'deal'
		q'ur.je.n-i	q'ur.ze.n-i	'grape'

This process is not unprecedented in the languages of the world. Similar processes of de-affrication occur in Basque, Yucatec Maya, Luiseño and other languages. We will first examine some data from these languages, and see whether the analyses proposed can be extended to the Georgian data. Data from Basque are presented in (7):

(7)	a.	ikas-tzen	→ ikasten	'learn'-IMP
		haz tzen	→ hasten	'grow'-IMP
	b.	hitz tegi	→ hiztegi	'dictionary'
		hitz keta	→ hizketa	'conversation'
		haritz ki	→ harizki	'oak wood'

Previous analyses of these data have considered de-affrication to be the result of an OCP effect, on [+cont] in the case of (7a), or on [−cont] in the case of (7b) (e.g. Hualde 1988; van de Weijer 1992). Such an account is corroborated by the fact that sequences of ordinary stops and fricatives were not allowed in the language either. It has been used as an argument that the manner features in affricates were unordered, monovalent features, so that the fricative part of an affricate could 'see' a preceding fricative through the stop part, and the stop part could 'see' a following stop through its fricative part. The Basque process is shown in (8):

(8)



ikas-tzan → ikasten hitz tegi → hiztegi

In the first case, the affricate loses its fricative part due to the preceding continuant. In the second case, the affricate loses its stop part due to the following stop. This makes the prediction that a sequence of two affricates is simplified to a sequence of fricative plus stop, which is indeed borne out: *huts tzen* →; *husten* 'empty-IMP', *utz tzen* →; *uzten* 'leave-IMP'. The process as in Basque can be formulated as a prohibition against two contiguous [αcont] specifications, as in (9):

(9) *[αcont] [αcont]

There are two main problems with extending this account to the Imeruli data. First, in both Basque and in the Imeruli dialect the effect is on *both* values of [±continuant], while it might be expected that such effects would usually target only one of the two specifications. To express this as a non-coincidence, the two effects should be captured by one rule or condition, and not, as in (9), by using alpha variables. This problem is aggravated in a unary framework, which must stipulate separate prohibitions on both [stop] and [cont] sequences, which are after all independent features. To the extent that monovalency is independently needed or stipulated, another account must be sought for. A second reason not to extend the Basque analysis to the Imeruli data is that in the Imeruli case the fricative part of affricates is not deleted *only* after fricatives, but also after /m n l/, which do not form a natural class with the fricatives, and the stop part of the affricates is not deleted *only* before stops but also before other segments like /r χ/ (Lomtadze 1999), which are also not usually classified with stops.

For these reasons we explore an alternative solution, based on the idea that complex segments are simplified under special circumstances; the unmarked emerges.

4. Analysis: Constraints on complexity

In this section we propose an alternative analysis of de-affrication, not based on the OCP, which relies on an 'emergence of the unmarked' effect (McCarthy & Prince 1994): while both complex segments and complex onsets are allowed as such, complex segments will be simplified in complex onsets.

First, we turn to complexity within the segment. The relative infrequency of complex segments can be expressed by a constraint such as (10):

(10) *Complex(Segment-Manner)
Root nodes do not branch for Manner features

A language which has (10) in high-ranked position does not permit any complex segments.[5]

Second, we turn to complexity at the prosodic level. One undisputed markedness statement is that clusters are dispreferred vis-à-vis monopositional onsets. This can be captured by the following constraint:

(11) *Complex(Onset)
The onset does not branch

A language which has (11) in high-ranked position does not permit any complex onsets, i.e. it does not permit any syllable-initial clusters.

It is clear that Georgian and its dialects permit both complex segments and branching onsets, i.e. neither (10) nor (11) is top-ranked.[6] However, the *com-bi-nation* of the two (a complex segment within a branching onset) is *not* permitted in the dialects: in special circumstances (in a branching onset), the unmarked, simple segment emerges.[7]

To rule out complex segments in branching onsets, *constraint conjunction* can be assumed (Smolensky 1995; Alderete 1997), in the 'disjunctive' sense of conjunction advocated by Hewitt & Crowhurst (1996), i.e. if an onset violates both (10) and (11) it violates the combined constraint. An alternative which we prefer is to regard the TIC not as a product of constraint conjunction, but as a primitive of prosodic theory, which in general favours binary structures over ternary ones: the fact that phonological structures can branch but cannot count to three seems involved here. The result will be as follows (after Wetzels 1986; see also van der Torre (2000) for similar insights), as a constraint which disallows three Manner specifications in one onset:

(12) Three-is-a-Crowd: *$[\text{M M M}]_{\text{Onset}}$ (TIC)
M = Manner specification ([stop] or [cont])

By implication, TIC also prohibits sequences of three independent segments in the onset. The following epenthesis and deletion data show that the scope of the constraint in (12) is indeed wider than the de-affrication facts alone:

(13)

Modern Georgian	**Imeruli**	
k'lde	k't'e	'mountain'
da.brk'o.l-e.b-a	da.-p'k'o.l-e.b-a	'obstacle'
bav.šv-i	bo.pš-i	'child'
da.xl-ši	da.x-ši	'in the counter'
sa.xl-ši	ša.x-ši	'at home'
prc͡kvn-i-s	pu.c͡kn-i-s	'sb. peels'
Modern Georgian	**Acharuli**	
k'lde	kil.t'e	'mountain'
prta	pta	'wing'
čka.r-ad	a.ši.ka.r-et	'quickly'

These data show that three-member clusters are simplified in various ways: by deletion, by insertion or complex segment simplification. The interaction of TIC with faithfulness constraints against deletion (MAX-IO) and insertion (DEP-IO) can be shown in the tableau in (14):

(14)

a. /sc'ori/	TIC	MAX-IO
sc'ori	*!	
st'ori		*
b. /daǰdoma/	TIC	MAX-IO
da.ǰdoma	*!	
da.ždoma		*
c. /k'lde/	TIC	MAX-IO, DEP-IO
k'lde	*!	
kilt'e	kilt'e	*

Apparently simplification of a complex segment (14a,b) is more favoured than epenthesis (14c). This can be achieved by ranking the constraint against deleting part of the segment lower than that against epenthesis.

Returning to Standard Georgian, this variety respects faithfulness more than

the TIC, as appears from onsets like the following, in which a labial stop combines freely with a coronal affricate:

(15) bǰe.n-a 'to lean (upon)'
da-p.če.n-a 'to open one's mouth (coll.)'
bč'-o.b-a 'discussion'

Thus, in Standard Georgian, the faithfulness constraints MAX-IO and DEP-IO are higher-ranked than the markedness constraint TIC.

5. Conclusion

There is clear evidence that in Georgian and its dialects affricates are complex segments. The de-affrication process that these segment are subject to in its Western dialects have parallels in a number of other languages. It seems that the process cannot be analysed straightforwardly as in earlier analyses of those languages. However, an alternative account is possible which reformulates the same insights in an OT framework. This analysis receives independent confirmation from other processes that achieve the same result: resolution of an onset that is too complex. Thus, the constraint we have proposed as Three-is-a-crowd expresses a 'rule conspiracy' in the sense of Kenstowicz & Kisseberth (1977): various effects are seen to operate to achieve one and the same output condition. Finally, we note that a markedness constraint (TIC) which is ranked higher in the dialects is overruled by faithfulness in the standard language, and we speculate that 'standard languages', to the extent that these can be defined, would more often show this type of relation.

Notes

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1. For phonetic evidence on the issue of whether harmonic groups are sequences or complex segments, cf. Butskhrikidze & van Heuven (2001). They suggest that their behaviour (in terms of hit rate and reaction time (latency) by native speakers) is in some ways 'in between' that of single segments and sequences. A compromise representation such as that in (4), with a single timing slot but with two root nodes, may reflect this pattern of behaviour. See Butskhrikidze (in progress) for further details on the phonology of harmonic groups.

2. Note, incidentally, that these representations crucially involve both a timing tier in the form of x-slots and root nodes. Thus, it would be impossible to transfer these representations to a mora theory, where there are no x-slots.

3. Occasionally, the process also takes lace in other dialects of Georgian, e.g. Moxeuri *cxeni* > *sxeni* 'horse', and *cximiani* > *sximiani* 'fatty'.

4. A lowered dot in the examples indicates a syllable boundary and a hyphen a morphological boundary.

5. A similar constraint *Complex(Segment-Place) (disallowing segments with two Place features) could be argued to be relevant to languages which only allow /i a u/ in certain positions, or languages which only allow plain labials, coronals and velars, if the elements representing vowel and consonant place of articulation are {**I A U**}, as per Dependency Phonology (Anderson & Ewen 1987; van de Weijer 1996). Georgian violates this constraint (as it violates *Complex(Segment-Manner) since it has affricates), since it has palato-alveolars, arguably consisting of a DORSAL and a CORONAL node (see (3) above).

6. See Butskhrikidze & van de Weijer (2001) for some discussion of Georgian phonotactic constraints. We argue there that Georgian does not allow more than two segments in the onset, i.e. obeys a restriction like $[\mathrm{R\ R}]_{\mathrm{Onset}}$ where R = Root node.

7. In other languages, too, there are interesting restrictions on the occurrence of complex segments within clusters. German or English, for instance, do not permit coronal affricates in initial clusters (possibly excepting /t͡s/ followed by the glide /w/ as in *Zwei, Zwiebel*), while the occurrence of the labial affricate /p͡f/ in German (if this is properly analysed as an affricate at all, which is not uncontroversial) is severely restricted (*Pflicht, Pflanze*). French allows [lwe] *louer* 'to rent' but not *[trwe]: see Kaye & Lowenstamm (1984: 138) for a similar account of this.

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