

## CHUVASH GEMINATION REVISITED

Michael Dobrovolsky  
University of Calgary

### 0. Introduction

This paper is concerned with the patterning and formal description of edge-geminate segments in Chuvash, a Turkic language spoken in the former Chuvash ASSR some 500 miles East of Moscow. I will try to draw together data that shows length alternations, stress, the selection of certain morpheme alternants, and word structure. The analysis is done in the framework of tiered phonology. In order to set the stage for the Chuvash data, I first survey the segmental inventory of Chuvash and then look at the way geminates are represented in current autosegmental work.

### 1. Inventory

Chuvash has the following underlying (native) consonant and vowel inventory (the symbol  $\xi$  represents a voiceless palatal fricative).

(1)	p	t	č		k
		s	š	ξ	x
	m	n			
		l			
		r			
	v/w		y		

There are no native voiced/voiceless contrasts among the obstruents. The obstruents are voiced between vowels and after sonorant consonants when followed by a vowel. In the dialect under consideration here, any consonant can be geminated. Geminate obstruents are always voiceless. Thus we can find contrasts like the following (Krueger 1961).

(2)	pěččën	[pěč:ën]	'alone'
	pěččëk	[pějčëk]	'small'

Contemporary Chuvash, perhaps partly under the influence of massive quantities of Russian loanwords, has reduced the opposition to a simple voice-voiceless one (though as I continue with phonetic research on Chuvash, it is increasingly my view that such consonantal oppositions in Chuvash are fortis/lenis and not voiceless/voiced). So where (2) indicates an earlier contrast, (3) indicates the contemporary (literary) one.

(3)	pěččěn	[pěččěn]	'alone'
	pěček	[pějək]	'small'

However, the contrast remains among the sonorants, as in (4).

(4)	alǎ	'hand'
	allǎ	'fifty'

The underlying vowel inventory is as follows:

(5)	i	ü	ɪ	u
	e	ě	a	ǎ

Of particular importance are the front and back 'reduced' vowels *ě* and *ǎ*. These vowels play a special role in the phonology in that they are weightless in stress assignment, are used epenthetically, and more likely to delete than full vowels not only in rapid speech but in morphological juxtaposition.

## 2. The Nature of Geminates in Autosegmental Phonology

If a geminate segment shortens, the implication (as long as there is no morphemic evidence to the contrary) for a tiered phonology is that it must be a 'true' geminate of the type illustrated in (6) in a CV framework

(6)	C C
	∖ /
	σ

and undergo a loss of timing unit on the CV tier, as for example, in (7) (as formulated in Hayes 1986: 346—of course either could be deleted):

(7)	C → ∅ /	$\overline{\text{C}}$
		∖ /
		σ

This type of representation is widely accepted in CV phonology and its congeners.

Hayes 1986 divides geminates into 'true' and 'fake' classes. The true geminates adhere to certain restrictions: they display ambiguity (sometimes acting as single elements in a rule like vowel shifting, sometimes as double in terms of their weight), integrity (they are not subject to being split by epenthesis), and inalterability (they resist the application of rules that would normally be expected to apply to one part of them). Fake geminates, which arise from a concatenation of morphemes that end and begin with the same segment, lack integrity and are subject to the various disfigurements noted above.

Chuvash shows alternation involving geminations such as the following:

- |     |         |               |       |                          |
|-----|---------|---------------|-------|--------------------------|
| (8) | a. pulǎ | 'fish' (Nom.) | pulla | 'fish+Dative/Accusative' |
|     | b. pulǎ | 'fish' (Nom.) | pulli | '3Person's fish'         |

If we assume that these geminates are underlying, they show the patterning of 'fake' geminates in that they are subject to phonological breakup and thus do not conform to the expected patterning of 'true' geminates. They appear to be 'fake', primarily in that they lack integrity. However, these geminates do not arise from the concatenation of morphemes.<sup>1</sup>

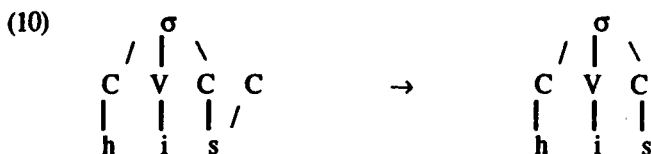
There is, however, a single characteristic that sets these geminates apart from those described in the recent literature: they are edge geminates. They are 'true' in that they are non-concatenative, but they are subject to a form of disintegration that replaces one of their constituent timing units with a vowel, as in the Nominative forms in (8).

Such 'edge effects' have been less dealt with in the literature of tiered phonology than word-internal 'true' geminates. Clements and Keyser (1983) deal with geminate edge effects in Turkish in a CV framework. They relate a number of apparently diverse phenomena—degemination, epenthesis, vowel shortening, final devoicing, and k-deletion—in Turkish to representations that allow for extrasyllabic segments that are linked in various ways to the phoneme tier. The following data is relevant to degemination.

- |     |             |             |                 |                  |
|-----|-------------|-------------|-----------------|------------------|
| (9) | <u>Acc.</u> | <u>Nom.</u> | <u>Ablative</u> |                  |
|     | hiss-ı      | his         | his-ten         | 'feeling'        |
|     | hakk-ı      | hak         | hak-tan         | 'right'          |
|     | zamm-ı      | zam         | zam-dan         | 'price increase' |

<sup>1</sup> I have no clear evidence that these geminates display ambiguity. Hayes (p.327) also notes that 'a heteromorphemic geminate WILL resist epenthesis, provided it derives from a rule of total assimilation.' There is a possibility that case forms that show such gemination might be derived from assimilation, if we assume that, say, the suffix-initial underlying *n* of the Dative-Accusative assimilates to an underlying final *l* in forms like *pulǎ* (see Dobrovolsky 1984 and/or Kreuger 1961 for data), but assimilation cannot be occurring in the possessive forms. As to epenthesis as a test, we are not dealing with epenthesis in the strict sense of the term here.

Assuming that each language has a 'core syllable component' (p. 60) that defines the range of well-formed syllables peculiar to it, they note that Turkish restricts syllables from ending in geminate Cs. Thus, while the Accusative forms must be taken as underlying, the language-specific restrictions on syllable type automatically disallow Nominative forms like \**hiss* and Ablative forms like \**hissten*, while syllabifying the Accusative forms in such a way that the underlying geminate is preserved. Their representation is as follows:



Edge degemination is thus defined as the deletion of an extrasyllabic segment from a representation.

Schein and Steriade (1986: 707-708) encounter edge geminates in Latin and deal with them in the Clements/Keyser framework.

'The oblique forms *mell-is*, *fell-is*, indicate that the stem ends in a geminate *ll*. The unsuffixed nominatives are derived as follows: underlying /mell/ is syllabified partially as *mel.l*, since no consonantal geminate can be tautosyllabic in Latin. . . ' (708) [see also ex. 26 and fnnt ref]

The syllabically stray final X of such forms is resyllabified where possible, and deleted in absolute word-final position.<sup>2</sup>

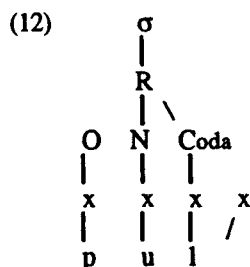
### 3. Chuvash Geminates as an Edge Effect

First off, Chuvash geminates suggest that the use of a CV tier is inappropriate to their representation. Recall that in Chuvash, the alternation is not CC ~ C, but CC ~ Cʷ. Attempting to capture this with a CV tier results in unmotivated representations, as shown in (11).

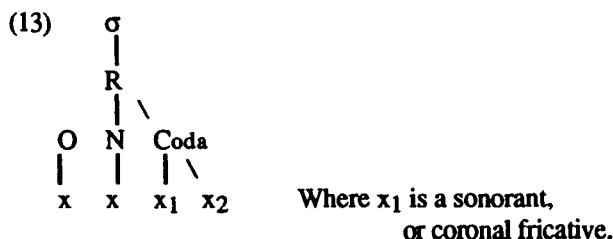
<sup>2</sup> The situation is lexically complex. Schein and Steriade claim in a footnote on the same page that these clusters 'persist in word-final position until the postlexical stages of the derivation', as evinced by 'by the metrical behavior of forms such as *miles(s)* 'soldier', *ter(r)* 'three times' (Niedermann 1953, 119-120).' I am not in a position here to state whether the same is true for Chuvash.

- (11) a.  $\begin{array}{cccc} \text{C} & \text{V} & \text{C} & \text{C} \\ | & | & | & / \\ \text{p} & \text{u} & \text{l} & \end{array} \rightarrow \begin{array}{cccc} \text{C} & \text{V} & \text{C} & \text{C} \\ | & | & | & | \\ \text{p} & \text{u} & \text{l} & \text{a} \end{array}$  (default to  $\text{v}$ -segment  
unmotivated)
- b.  $\begin{array}{cccc} \text{C} & \text{V} & \text{C} & \text{V} \\ | & | & | & \\ \text{p} & \text{u} & \text{l} & \text{a} \end{array} \rightarrow \begin{array}{cccc} \text{C} & \text{V} & \text{C} & \text{V} \\ | & | & | & \\ \text{p} & \text{u} & \text{l} & \end{array}$  (deletion of  $\text{v}$  and spread  
to V-slot unmotivated)

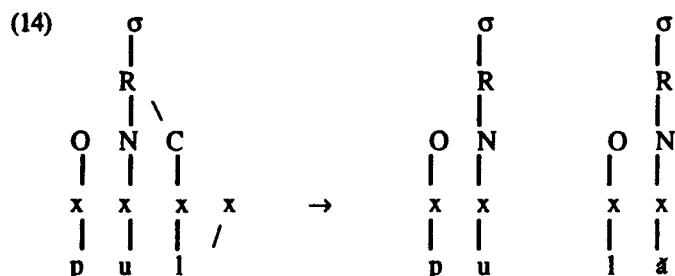
Of course, additional phonological devices or rules that change a C to a V or vice-versa could be invoked to guarantee more expected representations. However, the Chuvash alternations suggest that an x-tier rather than a CV is appropriate, since it is a class-neutral timing slot that manifests the alternation and not a C-slot. Use of an x-tier demands a fuller syllable structure than does a CV approach, since the CV value of the x's is determined by syllable position. The Chuvash UF could be provisionally represented as follows.



Since this configuration is not permitted by the core syllabification rules of the language, it must be adjusted. Chuvash native forms permit a maximum of two x's in a phonetically realised coda, the first of which must be a sonorant or coronal fricative. (In addition, l and r are prohibited in onset position.)



Unlike the Turkish case cited above, where the stray element is deleted from the (post) coda position, Chuvash syllabifies the stray *x* with a minimal (reduced) harmonic vowel, triggering resyllabification of the coda *x*. Better stated, perhaps resyllabification is triggered; given the patterning of the vowel, it may well not be considered syllabic here at all. However, the final reduced vowel is counted metrically at the phoneme tier.



But does Chuvash 'resyllabify'? We are free to assume that syllabification occurs, but the question is really whether this syllabification is relevant to the most general analysis of Chuvash geminate alternants. I will propose below that it is not.

We minimally require a vowel element word finally in such forms to guarantee the correct selection of certain morphophonemic alternants. Critical to this is the third person possessive morpheme (3Poss.). The 3Poss. form in Chuvash is alternating *i ~ e*, where (non-harmonizing) *-i* occurs after vowel final stems and (non-harmonic) *-e* occurs after consonant stems. As the following examples show, *č*-final stems pattern like V-final stems for 3Poss. forms. This 'vowel-final' patterning is indicated in the boxed material with the ⇒ pointer. The *-i* alternant apparently replaces a final stem vowel, as shown in (15) for both geminating and non-geminating stems.<sup>3</sup>

(15)	a. <u>C-Final Stems</u>	b. <u>V-Final Stems</u>	c. <u>Č-Final Stems</u>	
	ivāl 'son'	suxa 'plow'	pulā 'fish'	
	ivālām	suxam	pullām	1SPoss.
	ivālu	suxu	pullu	2SPoss.
⇒	ivālē	suxi	pulli	3Poss.
	ivālāmār	suxāmār	pullāmār	1Pl.Poss.
	ivālār	suxār	pullār	2Pl.Poss.

<sup>3</sup> Some other points about the possessive affixes can be noted here. The 2SPoss. is uniformly *-u*. In the 3Poss., stems ending in Č show affrication of the t, as in the example.

However, things aren't all that simple. The case paradigm suggests that these Cʷ-final stems that show gemination end in a consonant. Why? Because alternations of suffixes like the Dative/Accusative *-na ~ -a* and the Directive *-nAlla ~ -Alla* are conditioned by stem-final elements; the *n*-initial alternant appearing after vowel final stems, and the *-a* alternant after consonant final stems, as in (16), as indicated by the darker boxed material and → pointer. However, in the Locative and Ablative forms, the obstruent-initial alternants appear after consonant final stems, while the alternant *-rA* appears after vowel final stems, as in (15) ⇒.

(16)	a. <u>C-Final Stems</u>	b. <u>Cʷ-Final Stems</u>	c. <u>V-Final Stems</u>		
	ivāl 'son'	pulā 'fish'	suxa 'plow'	Nominative	∅
	→ ivālān	pullān	suxanān	Genitive	-nān
	→ ivālan	pulla	suxana	Dat./Acc.	-nA
⇒	ivālta	pulāra	suxara	Locative	-rA
⇒	ivāltan	pulāran	suxaran	Ablative	-rAn
	ivālpa	pulāpa	suxapa	Instrumental	-pA
	→ ivālalla	pullalla	suxanalla	Directive	-nAlla

So the geminate stems like *pulā* appear at times to be vowel-final, and at other times to be consonant-final.

A better understanding of this phenomena requires an investigation of the full range of geminating stem types, as well as of other stems that end in two consonants. The data in (17a.—g.), extracted from a list of all stems showing geminate alternants shows the range of geminating and non-geminating stems found in Chuvash. These forms were all found in Skvorcov's 40,000 word 1985 Chuvash-Russian dictionary.<sup>4</sup>

(17) Range of Chuvash stems showing gemination

a. <u>C-Final Stems</u>	b. <u>CC-Final Stems</u>	c. <u>V-Final Stems</u>	d. <u>Cʷ-Final Stems</u>
ivāl 'son'	pürt 'house'	suxa 'plow'	pulā 'fish'
ivālām	pürtēm	suxam	pullām 1SPoss.
ivālu	pürtu	suxu	pullu 2SPoss.
ivālē	pürtē	suxi	pulli 3Poss.
ivālāmār	pürtēmār	suxāmār	pullāmār 1Pl.Poss.
ivālār	pürtēr	suxār	pullār 2Pl.Poss.

<sup>4</sup> Thanks to the heroic efforts of Ruth Wolf.

e. C-Final Stems  
(geminating)

šin 'man'  
šinnām  
šinnu  
šinni  
šinnāmār  
šinnār

f. C-Final Stems  
with alternate form

tir ~ tirā 'grain'  
aka/akā 'plow'  
vut/vutā 'firewood'  
pus/pusā 'field'  
yüś/yüśē 'swamp'

g. CCv-Final Stems  
(non-geminating)

xāmpā 'bubble'  
xāmpām  
xāmpu  
xāmpi  
xāmpāmār  
xāmpār

but also

tārśā 'poll of ax'  
tārśšām  
tārśšu  
tārśsi

Example (18) sums up the final stem consonant alternations in possessive forms.<sup>5</sup>

(18) Have geminate alternants

... Cv]

May have geminate alternants

... C]  
... CCv]

No geminate alternants

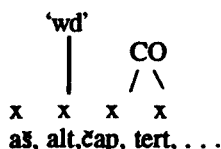
... CC]  
... V]

4. Analysis.

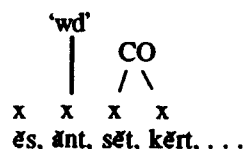
I will propose that all these alternations can be effectively represented by positing a phonological pseudoconstituent, referred to out of convenience as Co, that obligatorily consists of two x-tier elements. When, and how, these elements are filled or not filled by melody tier material accounts for the alternations.

First, consider the phonological representations of the Chuvash monosyllabic word given in (19).

(19)



or



<sup>5</sup> Benzig 1943 reports a levelling out of the Possessive paradigm away from the geminates to an unvarying (C)VCv stem for one speaker he encountered. He may well have encountered a speaker from Northwest Chuvashia, where gemination is not so strong. He also (1940: 252) reports the apparent addition of the 3Poss. in -ě to forms that already (regularly) end in the 3Poss. in -i: 'In manchen modernen Veröffentlichungen findet man die Possessivendung -i nochmals mit der Possessivendung -ə versehen: *χuzijə* statt *χuzi* < *χuzə* „Wirt“.' Given what has been noted about the UF of stems that end in phonetic [i] / underlying /ij/ following example 22, I suggest that speakers are interpreting the 3Poss. ending here as part of the stem and choosing a 3Poss. morpheme alternant accordingly.



No syllabic constituents are represented here. The syllable as a constituent is irrelevant to the analysis and description of the shape of the Chuvash monosyllabic word, its alternations, to suffix alternations, and to stress in monosyllabic and polysyllabic words. In other words, the syllable is not required for making many phonologically necessary generalizations about Chuvash (see Dobrovolsky 1994; I also discuss here in detail the question of canonical monosyllabic roots that do not end in consonants).

It is my contention that the relevant division of constituents in Chuvash is  $N Co$ , where  $Co$  is a coda-like 'constituent' that is obligatorily composed of 2  $x$ 's in the UFs of all monosyllabic words. But the constituent status of  $Co$  is dubious as well; I use it here only out of convenience. What is important about it is that it represents the two TUs ( $x x$ ) to the right of the vocalic element. The second of these TUs is sometimes manifested consonantly, sometimes vocally.

At this point, we must briefly consider Chuvash stress and its relation to full versus reduced vowels.

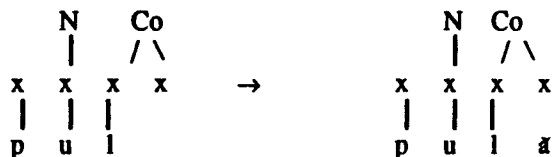
The currently accepted statement of the stress pattern of Chuvash words is: stress the last full vowel of a word; if there are no full vowels (= if a word only consists of reduced vowels), stress the first vowel. I have argued elsewhere (Dobrovolsky 1990) that formalisms based on this statement, such as Halle-Vergnaud 1987, are suspect. Nevertheless, whatever the formalism involved, it is necessary to scan for vowel weight in assigning stress.

As for deletion, Chuvash reduced vowels generally delete when concatenated with a full vowel, an expected event given the difference in weight between the two vowel types as manifested in stress assignment. A reduced vowel unassociated with any  $x$ -tier element can be interpreted as having no weight and thus serving simply as a phonetic place holder and easily subject to deletion. (Note though, that even this 'natural' deletion is lexicalized; some full vowels delete in favor of reduced-vowel-initial suffixes; this appears to be primarily associated with the derivational morphology; see also the 2Pl. Possessive forms above.) Representation (17b) provides a 'weightless' vowel, one that (eventually) has phonetic content but that is unrepresented on the  $x$ -tier. There are serious problems with this proposal, though. First, it is not clear how or why we can geminate the appropriate consonant since there is no  $x$ -tier element to link up with. Second, any stress formalism will need at least one timing element for reduced vowels since some stress is assigned to them.

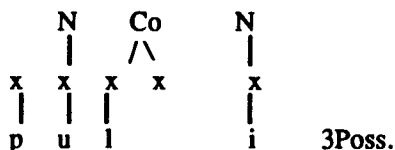
## 5. Case-by-case analysis.

The following examples present a case-by-case analysis of the geminate alternants using the syllable-free approach outlined above.

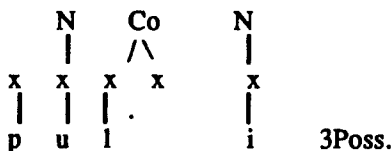
(20) REDUCED VOWEL STEMS IN NOMINATIVE (*pulā*, etc.): no final geminates, so final x filled by minimal vowel



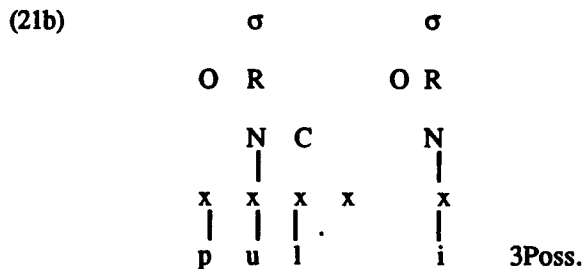
(21) 3P POSSESSIVE FORMS: the appropriate 3Poss. form is selected. The presence of this full vowel blocks appearance of the stem-final reduced vowel at the phoneme tier level.



(21a) The empty x-slot of the Co constituent is filled automatically by spreading,



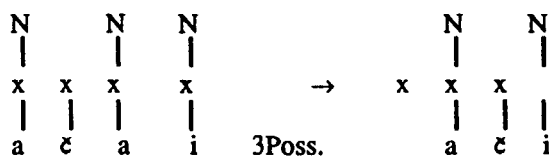
At this point, syllabification could be invoked. It would be assumed that the second x of the stem final consonant would serve ambisyllabically as the onset of the 'new' second syllable, as in (21b).



The point is of course that we do not need this apparatus to represent the alternation; it neither adds to our understanding nor explains the alternation.

Syllabification does not add to an understanding of the low-level phonetic detail. This word is pronounced (carefully) as [pʊtʲiː]. Segmental transcription cannot do full justice to the pronunciation, but the following can be noted. The long consonant shows evidence of consisting of two TU's; the first part of the consonant is somewhat velarized (following the back vowel), and the second part of the consonant is somewhat palatalized (preceding the front vowel of the suffix). There is a smooth transition between the two 'halves' of the consonant. While this suggests that an ambisyllabic model is a correct *syllabic* interpretation of the placement of the TUs, the syllabic model is not needed to account for the phonetic facts, which are equally well accounted for by straightforward models of assimilation that need not rely on a syllabic domain. In any event, a syllabic domain model would be forced to confront the fact that the suffix /i/ is lowered and retracted, showing that it is both resistant to and influenced by vowel harmony; resistant in that it does not blatantly alternate with /ɨ/ and influenced in that it does succumb to some extent to a retracting tendency. Again, though, a syllabic approach adds nothing here—the domain of the conflicting harmonic tendencies appears to be that of the word form.

## (22) FULL VOWEL-FINAL STEMS



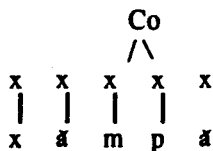
Here, the sequence is N1 N2 - N2. The deletion must be assumed to be at the N level due to fully layered association, since the x and its associated full V are deleted. Again, a syllabic analysis need not be invoked since a statement that two successive fully associated Vs are not permitted suffices.<sup>6</sup>

An interesting case of non-deletion of a final full vowel occurs in stem forms, both native and borrowed, that end in phonetic [i]. These forms take a 3Poss. alternant in -ě, the consonant-stem 3Poss. suffix, e.g., *šaši* 'mouse', 3Poss. *šašijě*, *noski* 'socks' (from Russian), *noskijě*. I have revised the analysis in Dobrovolsky 1984, and now analyze these forms as having stems that end in a glide that merges with the preceding high vowel (OCP effect on a class tier) in final position, e.g., UF: *šašij*. The glide however, is available for the appropriate selection of the

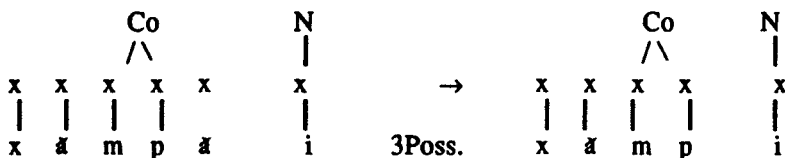
<sup>6</sup> Generally, the rightmost of two successive vowels concatenated morphologically is conserved, which is probably to be expected in a suffixing language. However, there are some lexical exceptions.

3Poss. form. Borrowed words ending in /i/ appear to have been analyzed as native in their underlying phonological structure.

(23) CC $\bar{v}$ -FINAL STEMS, NON-GEMINATING: no spreading possible; the x— $\bar{v}$  is deleted.

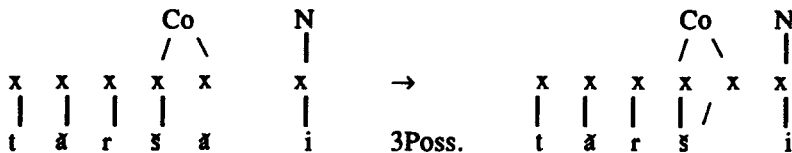


(23a)



These forms are interesting in that without the final reduced vowel, they fulfill the maximal permitted monosyllabic word template. The final reduced vowel, then, is truly extratemplatic here and therefore unassociated. Again, no syllabic representation is required to elucidate the alternation though, as shown above, it can be assumed that a syllabic tier exists and that the final consonant of the stem is either associated to the new syllable or remains ambisyllabic.

(24) CC $\bar{v}$ -FINAL STEMS, GEMINATING: the sonorant C is 'nuclear'

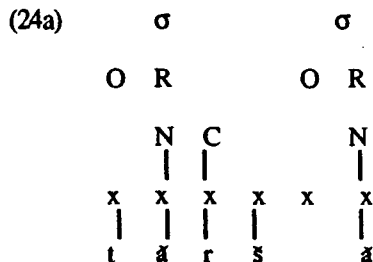


These forms parallel those of the *pul* class (20) in that the final consonant is ultimately associated with two TUs. Thus, postvocalic sonorant C is not part of the pseudoconstituent Co but more closely related to the stem vowel. We shall see immediately below that this varying placement of the postvocalic C is exploited in other ways.

I realize that the representation in (24) appears to violate my fundamental claim that the maximal monosyllabic word template has only 3 TUs in the rhyme. It may well be the case that

the reduced vowel here is what makes this possible. Forms like this are very rare, probably for good reason, in that they do violate the templatic requirements.

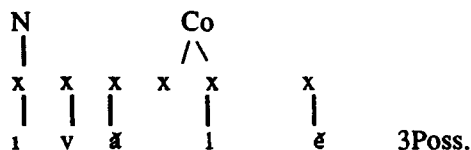
A syllabic approach might appear to help here. One could assume that the underlying long C was ambisyllabic, as in (24a).



The 3Poss. alternant *-i* would then simply replace the (arbitrarily) associated final reduced vowel, as in regular full-vowel final stems (example 22). But this solution is illusory, since the consonant in question is non-geminate in the uninflected form.

I now turn to the interesting class of forms with final consonants in the stem form. Here, we expect only the 3Poss. alternant in *-ə*. But if the stem template has two TUs after the vowel, how is this to be represented? I suggest that the final C is edgemost on the template, as represented in (25).

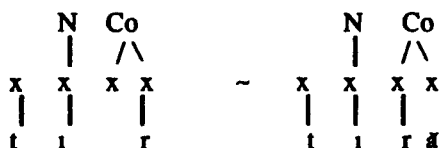
(25) C-FINAL STEMS, NON-GEMINATING: final C is edgemost



The otiose TU automatically deletes, since there are no long vowels in Chuvash.

Recall that there are C-final stems that alternate with C $\bar{v}$ -final stems and show no change in meaning. I suggest that the templatic representation virtually predicts this possibility, and that the final C placement fluctuates in these alternating stems.

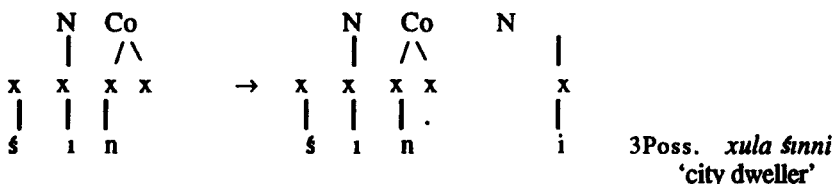
(26) C-FINAL STEMS THAT ALTERNATE WITH C $\bar{v}$ -FINAL STEMS: final C is edgemost ~ inmost



In these forms, the consonant final alternation takes the expected 3Poss. alternant in - $\bar{e}$  and the reduced-vowel final alternant takes the 3Poss. alternant in - $i$  and geminates as expected.

Finally, we see a class of forms that is C-final but that shows geminate alternants. Here, I assume the inmost placement of the final C but with no final reduced vowel. I can only assume that this is arbitrary.

(27) C-FINAL STEMS, GEMINATING: final C is inmost



Thus we encounter lexical edgemost and inmost placement of final Cs, with the expected results for gemination. Are such representations more ones of convenience? Interestingly, there are some cases that show that both placements can be exploited.

- |      |       |                             |
|------|-------|-----------------------------|
| (28) | xər   | 'girl'                      |
|      | xər̄  | 'girl+3Poss.'               |
|      | xər   | 'edge'                      |
|      | xərri | 'front side' < xər + 3Poss. |

Even this apparently highly phonologically motivated alternation is subject to further forms of lexicalization beside the types noted in A—C above. This evidence is found in both suffixal non-gemination and in certain compounds.

At least one nominalizing suffix, the occupational suffix - $\bar{s}\bar{e}$  ~ - $\bar{s}\bar{a}$ , fails to emerge geminated.

- (29)      sutuśă      'trader, business person'  
             tipă sutuşi      'grain dealer'

However, the suffix *-śēr* 'without' can be found in geminated forms. In Chuvash, as in Turkic in general, a form of the 3Poss. can be used to make specific nominals from adjectives (see Dobrovolsky 1992 for more discussion of this in Chuvash).

- (xx)      śerśēr      'landless' < śer 'land'  
             śerśērri      'landless one'

Perhaps not surprisingly, compounding shows some interesting variation. One type of Chuvash compound is made by affixing a homophonous form of the 3Poss. ending to two N's—the same element that may be used to make specific nominals. There are compound pairs one of which uses a geminating alternant and the other does not, as (x) shows.

- (xx)      tēpek      'top'  
             tēpekē > sāt tēpekē      'top+3Poss.': 'top of a hill, mountaintop'  
             tēpek      'top'  
             tēpekki > puś tēpekki      'top+3Poss.': 'crown of head'

Note that the first compound is both affixally regular and more transparent than the second. It may be that Chuvash exploits regular affixing to make transparent compounds and the homophonous 3Poss. affixing to make more opaque ones, but more needs to be done before this can be stated with any certainty.

## References

- Ašmarin, N. I, 1968. *Thesaurus Linguae Tschuvashorum*, II. Reprint: Kazan', 1929. *Indiana University Publications in Linguistics, Uralic and Altaic Series*, 70/2. Bloomington: Indiana University Press.
- Avery, Peter and K. Rice, 1991. 'On the relationship between laterality and coronality.' In Paradis, Carole and J.-F. Prunet (eds.), *The Special Status of Coronals: Internal and External Evidence*. Phonetics and Phonology, ed. Stephen R. Anderson and Patricia A. Keating, Vol. 2: 101-124. New York: Academic Press.
- Benzing, Johannes, 1943. *Kleine Einführung in die Tschuwaschische Sprache*. Berlin: Otto Stollberg.
- , 1940. 'Tschuwaschische Forschungen (I). Das Possessivsuffix der dritten Person.' *Zeitschrift der Deutsche Morgenlandgesellschaft*, 94 (Neue Folge, Bd. 19): 251-267.
- Clements, George N. and S. J. Keyser, 1983. *CV Phonology*. Cambridge, Mass.: MIT Press.

- Dobrovolsky, Michael, 1984. 'Abstract and concrete in Chuvash morphophonemics.' *Folia Slavica*, 7 (1-2): 120-134.
- , 1990. 'On Chuvash stress.' In Brendemoen, Bert (ed.) *Altaica Osloensia* (Proceedings from the 32nd Meeting of the Permanent International Altaistic Conference), 113-124. Oslo: Universitetsforlaget.
- , 1992. 'Towards a lexical phonology of Chuvash: inflection as derivation.' In Aronson, Howard I. (ed.) *The Non-Slavic Languages of the USSR: Linguistic Studies*, Second Series, 99-112.
- , 1994. 'Chuvash without syllables.' Paper presented at the *Sixth Conference on Turkish Linguistics*, Mainz, Germany, August, 1994. [MS submitted for publication.]
- Halle, Morris, and Jean-Roger Vergnaud, 1987. *An Essay on Stress*. Cambridge, Mass.: MIT Press.
- Hayes, Bruce, 1986. 'Inalterability in CV Phonology.' *Language*, 62: 321-352.
- Krueger, John, 1961. Chuvash Manual. *Indiana University Publications in Linguistics, Uralic and Altaic Series*, 7. Bloomington: Indiana University Press.
- Schein, Barry and D. Steriade, 1986. 'On geminates.' *Linguistic Inquiry*, 17: 691-744.
- Skvorcov, M. I. (ed.), 1985. *Чувашско-Русский Словарь*. Moskva: Russkij Jazyk.

*Author's Address*

Dept. of Linguistics  
University of Calgary  
Calgary Alberta Canada T2N 1N4  
dobrovol@acs.ucalgary.ca