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Itelmen reduplication: Edge-In association and lexical stratification[1]

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Reduplication patterns in Itelmen (Chukotko-Kamchatkan) present a prima facie challenge to the view that association in partial reduplication is always Edge-In (Yip 1988, McCarthy & Prince 1996). Closer investigation suggests that Itelmen reduplication may in fact be total copying, masked by an apocope rule. This solution is not obvious, however, as the apocope rule must be limited to 'core' or 'native' vocabulary. While Russian loans are reasonably transparent, the analysis requires making a distinction between cognates and loans from related Koryak, a distinction speakers are not consciously aware of. Positing that this distinction is part of the synchronic phonology provides a solution to other apparently unrelated phonological puzzles in the language. In addition to removing an apparent counter-example to universal Edge-In association, the proposals made here may also provide a small argument for the lexical stratification model of loanword phonology over a purely representational alternative.

1. Introduction

A one-syllable reduplicant suffix is one of the singular markers for nouns in Itelmen (a Chukotko-Kamchatkan language spoken now by fewer than 40 people on Russia's Kamchatka peninsula). With monosyllabic roots, the entire root melody is copied onto the suffix, as in (1a). The pattern with disyllabic roots, illustrated in (1b), is more interesting – the reduplicant appears to be a maximal syllable (C_0VC_0 – Itelmen tolerates onset and

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coda clusters), copied from the LEFT edge of the base, but affixed to the RIGHT.[2]

(1) (a) *monosyllabic bases*[3]

SINGULAR	PLURAL	GLOSS
kəp-kəp	kpə-ʔn	'tooth'
k'uΦ-k'uΦ	k'Φə-ʔn	'claw'
atx-atx	(atx-laχ)	'light'

(b) *disyllabic bases*

SINGULAR	PLURAL	GLOSS
misxu-misx	misxu-ʔn	'swan'
pəla-pəl	pəla-ʔn	'leaf'
ponta-pont	ponta-ʔn	'liver'

This description is of theoretical interest since it violates a purported universal characteristic of partial reduplication, known as MARANTZ'S GENERALIZATION. This generalization holds that association (i.e., copying of the melody of the base onto the prosodic template of the reduplicant) is always from the edge inwards. Thus, partial reduplication should involve left-to-right association in prefixes, but right-to-left association in suffixes (Yip 1988, McCarthy & Prince 1996, Nelson 2003). A string ABC should surface either as AB–ABC (left-to-right prefixing), or ABC–BC (right-to-left suffixing), but not as *ABC–AB (left-to-right association in suffixes); this, though, is exactly the pattern Itelmen appears to show.

Apparent examples of such 'wrong-side' reduplication have been noted and discussed before (indeed, Marantz (1982: 447) stated the generalization as a trend, not an absolute, see also Wiltshire & Marantz 2000). However, McCarthy & Prince (1996: 74) claim that '[t]he known [apparent counter]-examples … are either misanalyzed or too sparsely described for inferences to be drawn'. Nelson (2003: 11ff.) offers a more recent survey reaching the same conclusion. To illustrate, McCarthy & Prince consider an example of 'wrong-side' reduplication similar to the Itelmen case, from Itelmen's northern cousin Chukchi. In Chukchi, reduplication has a similar function, marking the absolutive singular for some nouns. Examples are given in (2).

[2] Symbols in transcriptions have their IPA values, except for *s* and *z*, which are (I believe) apical, post-alveolar fricatives, and *č*, used for IPA [tʃ]. I follow prior work in transcribing a sequence *ʔn* for, e.g., the plural, although this may be a glottalized /n/ rather than a true glottal stop. (For example, at least for the purposes of schwa epenthesis, it does not behave phonologically as a cluster.) Further qualifications about the data and sources are given below. Itelmen data is drawn from Volodin (1976), Volodin & Khaloimova (1989), and from my own field notes from 1993–2001. There are occasional discrepancies among and within these sources, especially as regards vowel quality and other aspects of the transcription, which I have not tried to regularize here. All translations are mine.

[3] The vowel (schwa) ~ zero alternations in (1a) involve a minimality-driven epenthesis rule (i.e., the root for 'tooth' is just /kp/), see Bobaljik (1998). This rule feeds reduplication and thus constitutes a case of over-application. I assume that the [u] in the form *k'uΦ-k'uΦ* is an epenthetic vowel, for whose labial quality is a result of the neighboring segment.

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(2) *Chukchi* (Krause 1980: 156)

(a) *CVCV bases*

SINGULAR	PLURAL	GLOSS
nute-nut	nute-t	'land'
tala-tal	tala-t	'meat'

(b) *CVCC bases*

SINGULAR	PLURAL	GLOSS
milɣ-əmil	milɣ-ət	'match'
tumɣ-ətum	tumɣ-ət	'comrade'

Like the Itelmen cases in (1b), these appear to illustrate left-to-right association in a suffix, in violation of Marantz's Generalization. However, McCarthy & Prince (1996) note that Chukchi has a rule of apocope, deleting stem-final vowels when they occur word-finally.[4] The effects of this rule are shown in (3), where UR = underlying representation.

(3) *Chukchi: stem-final vowels deleted word-finally* (Kenstowicz 1979: 405)

	UR	ABS.SG	ABS.PL	GLOSS
(a)	/milute/	milut	milute-t	'hare'
(b)	/uwequčи/	uwequč	uwequčи-t	'husband'
(c)	/imti/	imət	imti-t	'load'

The full underlying form of the root is visible in the plural, but the final vowel is deleted in the absolutive singular (in turn triggering schwa-epenthesis in (3c)). If the final vowel of the reduplicant is subject to the apocope rule, then (3) can be analyzed as full reduplication, followed by deletion of the final vowel, as in the derivation in (4). Since the reduplication can be seen as full copying, the issue of directionality of association, and with it the apparent counter-example it poses, disappears.

(4) /nute/ UR
nute-**nute** REDUPLICATION
nute-**nut** APOCOPE

An apocope rule, and thus a derivation like (4) for the words in (1b), looks initially implausible for Itelmen as vowel-final simple nouns are well attested in all sources. Some common examples are given in (5).[5]

[4] Note that the rule affects only root- or stem-final vowels, i.e., the final vowels of the underlying representations of noun roots, and perhaps derivational suffixes. Many inflectional suffixes are vowel-final, yielding vowel-final words on the surface. Function words such as pronouns may also be vowel-final on the surface without triggering apocope. Note also that care must be taken that 'word-finally' for apocope purposes deletes only the vowel in the copy, and not that in the base, an observation that would be relevant if one were to consider a compounding analysis of total reduplication, as Heather Goad (personal communication, July 2003) points out.

[5] An appeal to word minimality (or FtBin) to shield such forms from apocope seems unlikely, in the light of common words of one syllable, such as *p'eč* 'child', *ŋič* 'wife', *sit* 'belt', *uʔ* 'tree', *mem* 'hut', *kij* 'river', etc. Moreover, if the analysis in section 4.1 is correct, the last two of the words just cited are underlyingly CVCV, but lose their final vowel due to the apocope rule.

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(5) (a) lʲaŋe ‘girl’ qora ‘reindeer’
χolʲa ‘boy’ ŋejŋe ‘mountain’
(b) koroβa ‘cow’ skola ‘school’

In the remainder of this paper, I will construct an argument that the apocope solution is nevertheless the correct approach to Itelmen reduplication, and that, like Chukchi, the patterns in Itelmen do not challenge the universality of Edge-In association. Pursuing this argument requires accepting a notion of stratification of the lexicon, as in Ito & Mester (1999) and related work. All vowel-final simple nouns such as those in (5) belong to a non-core stratum; in other words, they are treated as partially assimilated non-native words. The apocope rule, and the reduplicative morpheme, are limited to the core stratum.

The remainder of the paper is organized as follows. The next section considers an additional argument to establish the initial plausibility of extending the apocope rule to Itelmen. Section 3 turns to the vowel-final nouns such as those in (5), presenting the argument that they are to be recognized as loanwords. Etymologically, this is obvious for the Russian loans in (5b), but is far trickier in the case of words like (5a), as this will require making a distinction between cognates and borrowings from a related language, Koryak (see also Fortescue 2003). Providing arguments for this distinction will form a large part of this section. In section 4, I will return to internal evidence for a final apocope rule in Itelmen, similar to that attested for Chukchi. Though such a rule has never been proposed, I will argue that positing this rule sheds light on two otherwise odd puzzles of Itelmen phonology, allowing a perfectly regular treatment of some patterns left as irregular in the prior literature. Section 5 turns to the theoretical question of the nature of the lexicon and underlying representations. I argue that the Itelmen facts might support the kind of stratification model put forward in Ito & Mester (1999), over alternatives in which the exceptional status of the words in (5) is encoded directly in their underlying representations, for example, by means of pre-syllabified final vowels or some equivalent diacritic. The argument is predicated on treating reduplication as having a particular morphological function in Itelmen, and that view is therefore defended in that section.

2. Itelmen apocope: initial plausibility

Although there are no obvious alternations in Itelmen paralleling the Chukchi evidence for apocope given in (3) – though see section 4 below – there is at least one argument in addition to the weight of the Edge-In universal itself that favours positing an apocope rule in the partial reduplication cases like (1b). The argument is straightforward, and essentially conclusive in form, but its force is tempered by the limited domain over which it applies. I offer it

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therefore to further buttress the initial plausibility of the account, prior to exploring the evidence for, and consequences of, treating all vowel-final simple nouns as loanwords.

Reduplication in Itelmen, as in the other Chukotko-Kamchatkan languages, serves a restricted function, marking the singular of some 100 or so nouns (Georg & Volodin 1999: 62). The majority of these are monosyllabic roots which undergo full reduplication (as in (1a)). These do not distinguish between full reduplication and reduplication of a single (maximal) syllable, and it is of course only in the latter approach that the question of directionality of association arises.

The apparent evidence for partial reduplication (as in (1b)) comes from the dozen or so disyllabic roots in the reduplicating class. The central hypothesis of this paper is that, as in Chukchi, the appearance of partial reduplication in these nouns is the result of total copying, followed by apocope, as sketched in (6) for the word for 'swan' from (1b).[6]

(6) /misxu/ UR
misxu- misxu REDUPLICATION
misxu- misx APOCOPE

Now, this analysis will mimic partial reduplication (as suffixation of a maximal syllable) only for those disyllabic roots that end in a vowel. This makes a clear prediction, namely, that if there are any disyllabic roots ending in a closed syllable (CVCVC) in the class of reduplicating nouns, then these should not be subject to the apocope rule, and should surface with a disyllabic copy.

This is exactly what happens. As Volodin (1976: 108) reports, 'disyllabic roots whose second syllable is open undergo PARTIAL reduplication … In case the second syllable is closed, full doubling takes place' (my translation-JDB; emphasis in the original). The force of this prediction is diminished by the closed class nature of reduplicating stems, however, as there are only two disyllabic nouns in this class.

(7) (a) qeβuŋ-qeβuŋ 'cartilage'
(b) ŋačas-ŋačas 'smoke'

The fact nevertheless remains, in favour of the apocope analysis, that there are no reduplicating nouns attested of the form **qeβuŋ-qeβ*, the form that would be predicted in place of (7a) by partial reduplication with left-to-right association. In section 4 I will return to further evidence for apocope in

[6] Volodin (1976) cites *misxu-mis* for this form, with loss of a consonant along with the final vowel; likewise *kelme-kel* 'cherry tree', *qomlo-qom* 'bone marrow' vs. *ponta-pont* 'liver' retaining the cluster. The clusters *lm*, *ml* are illicit word-final clusters in Itelmen, perhaps accounting for some of these forms – though they should normally be broken up by epenthesis, not deletion, if Bobaljik (1998) is correct. The cluster *sx* is not merely tolerated, but is in fact quite common, hence Volodin's form for 'swan' remains to be accounted for.

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Itelmen, drawn from outside the domain of reduplication, but for now I will take it as at least plausible that the Chukchi solution to the Edge-In problem extends to Itelmen. This of course requires addressing the apparent exceptions, and it is to this that I now turn.

3. Loanwords in Itelmen

There are approximately 81 vowel-final nouns in the 4000 word Itelmen-Russian-Itelmen dictionary (Volodin & Khaloimova 1989). This sample is of course not exhaustive, and the 4000 words in the dictionary include multiple productive derivatives from individual roots. Yet this number provides a convenient point of departure for this study.

3.1 *Obvious loans: Russian words in Itelmen*

Of these 81 words, the majority, 59, are transparently loanwords of Russian origin. Some examples are given in (8).[7]

(8)

	ITELMEN	RUSSIAN	GLOSS
(a)	kóroβa	<koróva	'cow'
(b)	skóla	<ʃkóla	'school'
(c)	kápusta	<kapústa	'cabbage'
(d)	sβóboda	<svobóda	'freedom'
(e)	révolucija	<rʲevolúcija	'revolution'

Russian loanwords are deeply, but not fully, assimilated into Itelmen grammar. Stress in these words uniformly follows the Itelmen pattern (initial syllable), Russian 'v' is replaced by the bilabial fricative [β], Russian /s,ʃ/ and /z,ʒ/ are merged to the Itelmen apical, post-alveolar [s,z], unstressed /o/ is not reduced to [a], and Russian /je/ is systematically simplified to [e].[8] In addition, Russian loans are productively combined with regular Itelmen morphology, such as the plural, and some derivational morphology, exemplified in (9).

[7] All speakers of Itelmen are not only fluent in Russian but now use the latter as their primary language of daily communication. Code-switching is extremely wide-spread, and next to impossible to distinguish from established borrowings, except in cases where a particular word has fallen out of use in Russian and is used only, or with a particular sense, in Itelmen; for example, *βoderin* <colloquial (Siberian) Russian *voderenʲ* 'entirely'. It is also important to stress that etymology and synchronic status need not coincide; as is well documented for other languages with such lexical stratification (English, Japanese), where etymological origin and synchronic classification are known to diverge for various individual lexical items (Ito & Mester 1999, note 7). Thus, the labels 'borrowed'/'loanword' are to be understood here as a synchronic diacritic dictating morphological and phonological behaviour; see section 5 for further discussion.

[8] Note also Itelmen *klep* 'bread' <Russian /xleb/ [xlʲep]; the reason for x→k is obscure, especially because *xl-* does occur as an onset cluster in Itelmen, cf. *sxliŋ* 'runner (of a sled)', etc.

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(9) okno-ʔn 'window-PL' <Russian /oknó/ 'window'
kapusta-ʔaʔn 'cabbage-POSS.PL' <Russian /kapústa/ 'cabbage'
stol-ank 'table-LOC' <Russian /stol/ 'table'

Russian loans are not fully assimilated, though, in as much as they preserve, for example, voiced oral stops /b,d,g/, (8d), otherwise unattested in Itelmen. In addition, Russian roots do not combine with all Itelmen morphology. For example, Russian adjectives do not surface with the common Itelmen adjectival suffix *-laχ*, but rather with a borrowed Russian adjectival suffix *-oj*. (Intriguingly, this happens regardless of the vowel the Russian adjective takes *-oj*, *-yj*, *-ij*, for example, Itelmen *pionerskoj* < Russian *pionér-sk-ij* 'pioneer-ADJ-INFLECTION'.) While speakers are generally comfortable inflecting nouns borrowed from Russian, loanword adjectives from Russian and Koryak typically do not inflect; Russian-source verbs are often used in periphrastic constructions with an auxiliary verb, but are also well attested with full Itelmen inflectional morphology.

These properties, taken together, lead to the conclusion that Russian loanwords in Itelmen are significantly, but not fully, assimilated to the synchronic grammar of Itelmen. This fact alone does not force any conclusions yet about how this is to be represented in the theory, but it allows the question of whether vowel-finality in nouns is a tolerated property of Itelmen phonology or rather, like voiced stops, is limited to that part of the lexicon marked as borrowed.

In fact, there is evidence that the vowel-final nature of the Russian loans in (8) is atypical of Itelmen. Alongside the vowel-final nouns in (8), Volodin & Khaloimova (1989) give roughly equally many nouns which are vowel-final in Russian, but which end in a glottal stop in Itelmen. Some of these are given in (10).

(10)

ITELMEN		RUSSIAN	GLOSS
bélkaʔ	<	bʲélka	'squirrel'
βójnaʔ	<	vojná	'war'
tórelkaʔ	<	tarʲélka	'plate'
búmagaʔ	<	bumága	'paper'

Glottal stop is not a common segment in Itelmen, and in fact only three or four native Itelmen words end in this segment. These are given in (11).[9]

(11) iʔ 'water' ma 'where.LOC' uʔ 'tree'

The fact that roughly as many vowel-final Russian nouns are borrowed with glottal-stop epenthesis as without (or the fact that glottal stop is epenthesized at all) provides a *prima facie* argument that (morphologically simple) nouns in Itelmen should not end in a vowel, and that the epenthesis is a repair strategy by which nouns are assimilated to Itelmen morpheme structure.

[9] Volodin & Khaloimova (1989) cite also *atqusaʔ* 'lame', which is not attested in my material.

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Lastly, if Itelmen really does not tolerate stem-final vowels, then one might expect some Russian nouns ending in a vowel to be borrowed without the final vowel. Though I have found no such nouns in Volodin & Khaloimova (1989), such nouns do occur in the material I have collected. An example is given in (12).[10]

(12) búmag <bumága 'paper'

While Russian loans are deeply integrated into Itelmen grammar, they are not fully integrated, as witnessed by the presence of voiced stops, and certain morphological incompatibilities. Hence, the existence of vowel-final Russian loans need not stand in the way of positing an apocope rule along Chukchi lines, so long as that rule is restricted to the non-borrowed vocabulary. Moreover, the glottal-stop epenthesis in some Russian borrowings is suggestive of an intolerance of vowel-final noun roots in Itelmen.

3.2 *Koryak loans: the less obvious cases*

Although the majority of the vowel-final nouns in Volodin & Khaloimova (1989) are Russian loans, the number of nouns that are not of Russian origin is not negligible (on the order of 20 in the dictionary). Below is a representative list, with corresponding plurals.

(13)

UR	SINGULAR	PLURAL	GLOSS
/lʲaŋe/	lʲaŋe	lʲaŋe-ʔn	'girl'
/alʲa/	alʲa	alʲa-ʔn	'brother' (or 'older brother')
/χiβne/	χiβne	χiβne-ʔn	'wolf'
/ŋejŋe/	ŋejŋe	ŋejŋe-ʔn	'mountain'
/qora/	qora	qora-ʔn	'reindeer'
/quβa/	quββa	quββa-ʔn	'pants'
/lʲepxe/	lʲepxe	lʲepxe-ʔn	'basket'
/χolʲa/	χolʲa	χolʲa-ʔn	'boy'

[10] Note that I would not want to argue that this form is synchronically subject to the apocope rule, with UR /bumaga/ for this speaker. I would argue instead that the word has been borrowed from Russian as /bumag/ without the final vowel. Below, I will argue that the apocope rule is limited to the core stratum of Itelmen vocabulary, and the two voiced stops in this word mark it as belonging to the borrowed stratum. This word is stable in this form for this speaker (also a fluent speaker of Russian), but I do not know how many other Russian nouns are borrowed with their final vowels missing.

There is an important question here. I am implicitly distinguishing between two kinds of faithfulness relations, namely, the relationship between the input/underlying representation and the output, in Itelmen, on the one hand, and between the Russian source word and the underlying representation of the word in Itelmen on the other. My impression is that these are often conflated in Optimality Theory (OT) accounts invoking Faithfulness. Such a conflation will not work here, but more importantly, seems to me to be insupportable on general grounds; for example, many older Itelmen speakers do not distinguish Russian [s] from [ʃ] or [z] from [ʒ] even when speaking Russian. I strongly suspect that they do not accurately perceive the distinction, hence cannot mark it accurately in the mental representations over which faithfulness constraints are computed.

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Most of these words are of clear Chukotko-Kamchatkan stock, etymologically, finding apparent cognates in the related languages Koryak and Chukchi. Those words from (13) that find clear or probable correspondents in Zhukova's (1990) dictionary of Koryak are given in (14).[11]

(14)	ITELMEN	KORYAK	GLOSS (ITEL./KOR.)
	ɬʲaŋe	ɬʲaŋe	'girl'
	aɬʲa	(?)jelʕalŋə-	'brother'/'cousin'
	χiβne	ʕeɣə-lŋən	'wolf'[12]
	ŋejŋe	ŋej-ŋej	'mountain'[13]
	qora	qoja-ŋa	'reindeer'[14]
	χoɬʲa	ʕoɬʲa	'boy'/'man'

Yet it is precisely because Itelmen and Koryak are genetically related that it is difficult to argue that the words in (13) are loans, rather than cognates.[15] Nevertheless, there is a variety of observations to be made that can be taken as indicators of the loanword status of the vowel-final nouns such as those in (13). To some degree, the synchronic observations presented here converge with the diachronic considerations which lead Fortescue (2003) to suggest loanword status for some of these words as well.

First, none of the vowel-final nouns in Volodin & Khaloimova (1989) contains an ejective consonant. The ejective series (p', t', k', q', č') is unique to Itelmen among the Chuktoko-Kamchatkan languages. An example was given in (1a) above and others appear in (24) and (25) below. While there is of course no requirement that every word have an ejective, the complementarity between ejectives and vowel-finality is striking. Moreover, it receives a historical explanation if the source of all vowel-final words is Koryak, a language lacking ejective consonants, and remains an accidental gap

[11] Itelmen- and Koryak-speaking areas have historically overlapped. In the region of the Tigil River in particular (for example, the village of Sedanka) Koryak–Itelmen intermarriage and bilingualism were not uncommon, even within living memory (e.g., the parents of the current generation of Itelmen speakers).

[12] The β:ɣ correspondence in the word for 'wolf' is supported by frequent $\beta \sim \gamma \sim \gamma^{w}$ variations internal to Itelmen and among speakers.

[13] Note that this source word is not vowel-final in Koryak. The root for 'mountain' in Koryak is *ŋej*, the source of the borrowing being the reduplicated absolutive singular, which is nevertheless not treated as a reduplicated form in Itelmen and loses the final glide.

[14] The Itelmen form given here is from the Sedanka dialect, the Southern (Khairjuzovo) form being /*qoz*/, with expected *r > /z/ and no final vowel. The Koryak form is cited from Zhukova (1990). Note that this includes a red herring, namely, *r > /j/, a sound change not evidenced in all Koryak dialects; hence, the Koryak dialect contiguous with Sedanka may well have *qora-ŋa*.

[15] Despite the comments in Georg & Volodin (1999), the genetic affinity of Itelmen and the Chukotko-Kamchatkan languages is not seriously in doubt. The strongest evidence is the extensive parallels (and gaps) in the very complex inflectional morphology, as noted by Comrie (1983); see also Fortescue (2003) for detailed discussion.

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otherwise. There is certainly no synchronic phonological reason why ejectives should not surface in vowel-final nouns.

Another phonotactic property that sets Itelmen aside from the other Chukotko-Kamchatkan languages is its tolerance of large consonant clusters. In both Chukchi and Koryak, the syllable is maximally CVC, which means that clusters are tolerated only at the point of contact between syllables, and consist of maximally two consonants. By contrast, Itelmen allows impressive clusters not only between vowels but also word-initially and word-finally, as shown in (15).[16]

(15) čkpəč 'spoon' tΦsčŋin 'you are carrying it'
kłqzukneʔn 'they were' mskčeʔn 'I will make them'
sitłxpk'eł 'with embers' k'ənsłxč 'boil it!'

Consonant clusters are thus a distinctive property of Itelmen phonotactics, setting Itelmen words off from words in related languages. Once again, none of the vowel-final words contains a distinctively Itelmen consonant cluster. Like the ejectives, the absence of a cluster does not mark a word as being non-Itelmen, but the systematic absence of clusters in the class of vowel-final nouns would have to be purely accidental, unless these words are in fact of Koryak origin, i.e., borrowed from a language which does not tolerate such complex clusters.

In addition to the systematic lack of distinguishing Itelmen characteristics in any of the vowel-final words, there are also some overt clues of Koryak origin in the words in (14). Just as the voiced stops occur only in Russian loanwords, the phonemes l^j, n^j and *r* are also generally considered to occur in Itelmen only in loanwords, either of Russian or of Chukotkan origin (Georg & Volodin 1999, Fortescue 2003; on *r*, see Bouda 1970).[17]

In addition to the synchronic surface criteria just considered (lack of ejectives, lack of consonant clusters, presence of Koryak segments), by which the vowel-final nouns are anomalous within Itelmen, Fortescue (2003) provides diachronic evidence that a number of Itelmen words have failed to undergo sound changes that would have been expected had they been true cognates as opposed to borrowings. In addition to words with initial l^j-, n^j-, this includes words with initial *j*- which should have undergone a regular sound change to *z*- in Itelmen (and sometimes further to *s*- in the Khairjuzovo dialect), on which see also section 5 below.

[16] Although clusters of arbitrary length appear to be allowed, voiced consonants (nasals, glides, voiced fricatives) are not tolerated within a cluster, and can only be adjacent to the syllable nucleus (with some exceptions stem-initially); see Bobaljik (1998).

[17] Once again, we may use Volodin & Khaloimova (1989) as a representative sample. Initial n^j- occurs with only three roots, two of which are transparent Russian borrowings (*n^{j}an^{j}a* 'older sister' and *n^{j}ekak* 'in no way'). Similarly, the dictionary heading for initial l^j- is conspicuously short (eight roots); except for one function word, either Russian loanwords or words of the sort investigated here.

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As a final comment in support of the plausibility of positing Koryak loans in Itelmen, I return to the issue of morphological compatibility, mentioned in connection with Russian. Itelmen, especially the Sedanka dialect, has quite a few adjectives bearing the distinctive Koryak adjectival (participial) morphology *n-√-qin* (vowel harmony alternant *-qen*). Some of these are listed in (16).[18]

(16)

ITELMEN (SEDANKA)		KORYAK
nomqen	'fat'	nəʕumqin
niruaqen	'sharp'	ničvəqen
nmətqen	'able'	nəmitqin
nqetoqen	'strong'	nəketɣuqin
nipuqen	'big (of river)'	(< ʔnəpawqin 'wide')

As comparison with synonymous Koryak forms from Moll (1960) shows, these have undergone some degree of assimilation to Itelmen (e.g., loss of first-syllable schwa, regularization of vowel harmony variants). And while these adjectives were used easily in contexts without inflection, like the Russian source adjectives in *-oj*, the speakers who provided these adjectives in Itelmen (none of whom speaks Koryak) found it difficult to inflect these adjectives in oblique case environments, in contrast with adjectives of clear Itelmen origin.

I take this as further evidence not only for the existence of Koryak loanwords but also for their partly, rather than fully, assimilated nature within the stratified synchronic Itelmen lexicon.

In sum, then, there appears to be reasonable evidence for treating at least some of the vowel-final nouns in Itelmen as being not only etymologically loanwords from the language's northern neighbor, but also for their being anomalous within synchronic Itelmen grammar. Even for those words which lack overt clues as to their anomalous nature (other than vowel-finality), treating them as anomalous is consistent with the absence of consonant clusters and ejective consonants. I conclude then, that the plausibility of extending the apocope solution to the Edge-In problem to Itelmen partial reduplication is not compromised by the existence of the class of vowel-final nouns in (8) and (13). In the next section, I will attempt to push the hypothesis one step further and argue that there is overt evidence for the apocope rule in Itelmen, once one knows to look for it.

[18] Although the various dialects of Itelmen have an extremely high level of mutual intelligibility, the majority of these words were unknown to speakers of the Khairjuzovo dialect consulted in 1996.

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4. Apocope in Itelmen: more evidence

Alternations such as those in (3) above provide straightforward evidence for an apocope rule in Chukchi, the rule that in turn provides the basis for understanding the nature of the apparent counter-examples to universal Edge-In association. No such alternations are obvious in Itelmen, and no apocope rule has been proposed. Nevertheless, in addition to the account of Itelmen reduplication, there are at least two additional reasons to suspect that Itelmen does not in fact tolerate stem-final vowels in word-final position, and that these situations are resolved, as in Chukchi, by apocope.

4.1 *Diminutive puzzle 1*

The first such clue comes from a set of diminutive forms, treated by Volodin (1976) as irregular.[19] Regular diminutive (DIM) formation in Itelmen, which applies productively to loanwords and native vocabulary alike, shows two straightforward allomorphs in the singular, *-čaχ* after consonant-final stems, and *-čχ* after vowel-final stems. The plural has yet a third allomorph, *-č*, which always follows the regular plural suffix, e.g., *kist-eʔn-č* 'star-PL-DIM', *eŋeze-ʔn-č* 'star-PL-DIM'.[20] The singular allomorphs are illustrated in (17), keeping in mind that under the analysis here, the forms in the right column must be Koryak loans.

(17)	-čaχ/C___		-čχ/V___	
	kist-čaχ	'house'	quββa-čχ	'pants (SG)'
	lač-čaχ	'sun'	reβne-čχ	'partridge'
	kəmlon-čaχ	'grandchild'	ŋejŋe-čχ	'mountain'

Alongside these, Volodin (1976: 132) notes that for a number of nouns that are consonant-final in the singular their diminutive counterpart has the post-vocalic allomorph, in which case a vowel appears stem-finally.[21]

[19] An apocope approach to these forms was first suggested to me by Susi Wurmbrand (personal communication, ca. 1996).

[20] Since both the plural and the diminutive plural are fully productive, this constitutes a clear case of the diminutive suffix following a productive plural suffix, a situation which Perlmutter (1988) claims is impossible. Perlmutter argues that all forms with this pattern in Yiddish involve suppletive plurals. For Itelmen, this would amount to the untenable claim that all plurals, including those of nonce borrowings, are suppletive. See Bobaljik (2005) for a brief elaboration of this point.

[21] According to Volodin, there is predictable gemination of a single intervocalic consonant in post-tonic position (hence the gemination in the diminutive form (18b)). Gemination is inconsistently marked in Volodin's examples and in my own data; I have refrained from regularizing forms.

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(18)	(a)	mem	'hut'	meme-čχ	DIM
	(b)	pχal(-pχal)	'hole'	pχal^{jj}a-čχ	DIM
	(c)	sik'uk'	'spider'	sik'uk'e-čχ	DIM
	(d)	kij	'river'	kije-čχ	DIM

While there is some speaker variation (e.g., forms such as *mem-čaχ* are attested alongside (18a)), these diminutive forms would be quite puzzling if Itelmen did not have an apocope rule. On the other hand, the apocope rule suggested above to resolve the reduplication puzzle would extend straightforwardly to these cases. The underlying representation of nouns like those in (18) contains the final vowel, deleted in the singular by the apocope rule.

Note that these nouns have traits that are distinctive of native Itelmen phonology, as discussed in section 3.2 above, namely, the initial cluster /pχ/ in (18b) and the ejectives in (18c). Moreover, as Michael Fortescue points out (personal communication 2002), these two words are implausible candidates for borrowings from Koryak as these words lack any plausible candidate source words in the attested Chukotkan material.[22]

The account might also extend to nouns formed with the collective suffix, which surfaces as *-al* in plain forms. Volodin (1976) notes that to the extent that diminutives with this suffix are attested, they are always formed as if the suffix was actually *-ala*, as is shown in (19).[23]

(19)	(a)	stoβ-al	'cedar grove'	stoβ-ala-čχ	DIM	
	(b)	Φuzβ-al	'bushes'	Φuzβ-ala-čχ	DIM	< Φizβu-m 'bush'
	(c)	°sis-al	'grassy area'	sis-ala-čχ	DIM	< °sis 'grass'[24]

If I am correct in positing vowel-final underlying forms for the nouns in (18) and the collective suffix, then (allowing for the interference factor of speaker variation mentioned above) we would expect to find the vowel before other consonant-initial suffixes as well, for example, before the ablative suffix *-x'al*. There is, unfortunately, too little data available to draw firm conclusions, and what there is is contradictory. Thus, while the form that I have found

[22] The palatal l^j in (18b) is thus surprising, though it occurs in the diminutive form only. There is at least one other native root containing palatal l^j, namely, the root for 'small', *ul^{j}u-*, which also triggers palatalization of the initial segment of the (otherwise regular) Itelmen adjectival suffix *-laχ*: *ul^{j}u-l^{j}aχ*.

[23] Note that inflectional suffixes such as the dative case are vowel-final on the surface (thus exempt from the apocope rule) in Itelmen, as they are in Chukchi. Further investigation would be required to determine which – if any – other affixes are subject to apocope.

[24] The symbol ° before this root indicates a pronunciation with compressed lips throughout the word, referred to by Georg & Volodin (1999: 24–26) as 'labialization' (this is not indicated in Volodin 1976, however, from which the diminutive form is taken). This phenomenon applies to a small class of morphemes in the Southern dialects only, and is ill-understood at this time (it may be pharyngealization, as suggested by Heather Goad, personal communication, 1996).

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recurring in my own recordings quite clearly has the vowel we might expect (20a), the one ablative of a collective noun given by Volodin (1976) lacks this vowel (20b).

(20) (a) stoβ-ala-x'al
(b) sis-al-x'al Volodin (1976: 144)

I must therefore leave the broader prediction as unresolved at this point.

4.2 *Diminutive puzzle 2*

There is a second observation in Volodin's material on which the proposed apocope rule – or more precisely, the avoidance of vowel-final nouns – may shed light, although it should be noted that the analysis is somewhat tentative.

In the previous section, I presented examples illustrating the productive diminutive formation rule, with two allomorphs, one for consonant-final and one for vowel-final roots. Volodin (1976: 132) also notes (readily confirmed in my own material) that '[a]n entire group of words exists only in the -*čχ* form, and to establish their source forms appears to be impossible – so intimately is the affix united with the root'.[25] Some examples are given in (21).

(21)	eke-čχ	'girl'	eke-ʔn-č	PL
	nʲenʲeke-čχ	'child'	nʲenʲeke-ʔn-č	PL
	lʲulʲu-čχ	'breast'		
	pilʲlʲu-čχ	'penis (of boy)'		
	maβa-čχ	'fry' (i.e., 'young fish')		

The plurals, as observed by Volodin, demonstrate that the affix has not been lexicalized as part of the stem, as they follow the regular rule of Itelmen plural diminutive formation, noted in section 4.1. So, the stems should be transparent, but are simply not used. Of course, this situation occurs also elsewhere, and the semantic field of the examples is what one might expect. The puzzle here is not the absence of the non-diminutive roots *per se*, but rather the striking asymmetry between fixed diminutives taking the post-vocalic allomorph and the near absence of fixed diminutives built on consonant-final roots.[26] To this should be added the observation that most of the nouns like those in (21) are clear borrowings from Koryak, given the criteria suggested above.

[25] What Volodin appears to mean, which is consistent with my own observations, is that despite the identifiable nature of the root in these words, speakers tend to reject the root when not used with the diminutive as not being a word of Itelmen. Once again, there appears to be some variation, e.g., some speakers treat *eŋeze-čχ* 'star' as a fixed diminutive, though Volodin (p. 133) reports a non-diminutive counterpart *ŋeze-m* (alongside *-m* class diminutive, *ŋeze-m-čaχ*).

[26] Volodin also cites two nouns which occur only in the diminutive and which have consonant-final stems: *qisχ-čaχ* 'sky' and *nustax-čaχ* 'god'.

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From this perspective, this diminutive puzzle is reminiscent of the fate of Russian vowel-final nouns borrowed into Itelmen. Though their loanword status exempts them from the apocope rule, allowing them to remain vowel-final in Itelmen (as in (8) above), there is nevertheless a dispreference for such nouns and many are reanalyzed as terminating in a glottal stop, as in (10). Koryak-source vowel-final roots are likewise exempt from apocope, a number surviving as vowel-final nouns in Itelmen (13). Nevertheless, I suggest that the dispreference for vowel-final nouns on the surface manifests itself here too, but in this case as pressure against using the clearly discernible roots in (21) in non-diminutive contexts.[27] Like the glottal-stop epenthesis in Russian nouns, the dispreference is not absolute, yielding an apparent unpredictability – for any particular Russian or Koryak vowel-final noun, there appears to be no way to predict whether it will surface as such in Itelmen, or pattern with either (10) or (21). What is not random, it seems, is the significance of the dispreference for vowel-final nouns in this process. Were there no such dispreference, then one would expect to find equally many consonant-final borrowings (of which there are plenty) restricted to their diminutive forms.

In part, but not only because of the degree of unpredictability involved, the direction suggested here raises a number of thorny questions of implementation, including that of the proper characterization of the dispreference. Nevertheless, I will set these issues aside and turn next to the question of the representation of the loanwords within Itelmen phonology.

5. Reduplication, apocope and lexical stratification

The arguments in the two preceding sections have been somewhat tentative at times, yet the general picture that emerges is one in which Itelmen synchronic phonology distinguishes between at least two classes of roots, native and non-native. This is more than a static generalization about morpheme shapes, as the distinction is also relevant to phonological rules and combinatorial restrictions on morphemes, such as the impossibility of inflecting non-native adjectives. Assuming that this picture is correct – at least in its broad strokes – the question arises of the implementation of this distinction within the Itelmen lexicon.

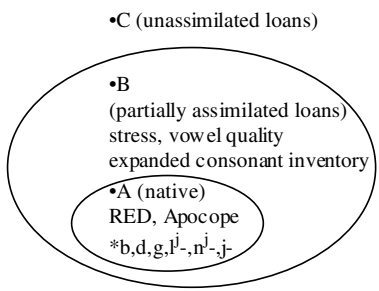
The issue here bears on an important difference among approaches to the treatment of loanwords in phonology, in particular, their representation in the synchronic lexicon of a single language. One type of approach is exemplified by Ito & Mester (1999). It places co-existing subsystems, or CO-PHONOLOGIES, within a single grammar (however they are to be encoded). Ito & Mester (1999) present a proposal in which the phonological lexicon

[27] The apocope rule would not apply to these nouns, since by hypothesis it is restricted to the native or core stratum of the lexicon, and these nouns bear hallmarks of belonging to a non-core stratum.

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is stratified. For expository purposes, this may be visualized as a series of concentric circles with 'core' or 'native' vocabulary in the innermost circle, and the outer circles representing progressively less assimilated loanwords. Phonological processes (rules or constraints) are also assigned to designated strata, with implications deriving from the concentricity of the model; for example, any rule that applies to an outer stratum will also apply to all inner strata, but not vice versa. This is sketched roughly in (22) (where RED = the abstract morpheme behind reduplication, cf. Marantz 1982). Items occupying stratum A are native, and thus are subject to apocope, but cannot contain borrowed onsets. Stratum B consists of partially assimilated loans, allowing an expanded (but not unlimited) consonant inventory. Stress applies at stratum B, and thus, by implication, also at Stratum A.

(22) (*Partial*) *stratification of the Itelmen lexicon*



An alternative approach to loanword phonology is that advocated by Inkelas, Orgun & Zoll (1997). In brief, it places the distinction between loanword and native vocabularies entirely within the representations assigned to individual lexical items, with these representations then feeding into a single, independently established synchronic phonology in such a way as to derive the correct results. For example, in the case of the (surface) vowel-final nouns, one could assign the vowel a status in the underlying representation different than that assigned to the underlying final vowel in those nouns that undergo apocope. This could be done with presyllabification or prelinking to timing slots or other mechanisms.

One of the main empirical differences between these two approaches (as far as I can see) lies in the notion of concentricity and compatibility. While both systems allow a certain amount of hybrid behavior, whereby a given morpheme may be assimilated with respect to one rule but not with respect to another, they differ in terms of the distribution of such mixed behavior. The stratification model, but not the representational model, enforces a 'hierarchy of foreignness, with exceptions to one rule always being exceptions to another rule, but not vice versa' (Kiparsky 1968: 20).

The stratification view, I suggest, explains a gap in Itelmen reduplication patterns, specifically, the absence of reduplicating forms which escape the

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apocope rule. Why are there no Itelmen reduplicating forms with the surface shape CVCV–CVCV? Itelmen does borrow reduplicating roots from neighboring languages, yet their behaviour changes in a manner that is predictable only if there is an incompatibility between reduplication and loanword status. I suggest that the abstract morpheme behind reduplication, -RED (cf. Marantz 1982), belongs to the core stratum. This not only explains why reduplication is always subject to apocope (when the structural description is met) but it also explains the odd behaviour of borrowed reduplicating stems (described below). The argument to be presented here requires a brief aside on the nature of reduplication within Itelmen morphology and phonology, in a little more detail than has been presented above.

5.1 *Excursus: reduplication as a class marker*

Since previous work on Itelmen has identified reduplication as a morphological process (rather than a morpheme), I include a brief diversion at this point in order to support my identification of the morpheme -RED and, more specifically, its identity as a singular class marker. This will lead into the final aspect of stratification, to be discussed in section 5.2, namely, a mysterious gap in the Itelmen lexicon which may find an account in terms of stratification.

It was noted in section 2 that reduplication in Itelmen, as in the other Chukotko-Kamchatkan languages, serves a restricted function, marking the singular of fewer than 100 nouns (Georg & Volodin 1999: 62). Some examples are given in (23), two of which are repeated from (1a).[28]

(23)

SINGULAR	PLURAL	GLOSS	SINGULAR	PLURAL	GLOSS
kəp-kəp	kpə-ʔn	'tooth'	silq-silq	silq-aʔn	'meat with berries'
k'uΦ-k'uΦ	k'Φə-ʔn	'claw'	ŋəl-ŋəl	ŋə-ʔl	'roe, caviar'[29]
°čełx-°čełx	°čłxə-ʔn	'cowberry'	tam-tam	tam-eʔn	'growth, tumor'

Reduplicating bases that alternate with simple roots have reduplication only in the singular of nouns. Roots are reduplicated neither in the plural (cf. (1), (23)), nor when used as verbs or adjectives (cf. (24); since these roots are generally abstract nouns, plurals are generally not attested, though see (24c)). Note that this applies also to partial reduplication, as in (24b).

[28] The forms in the left-hand column of (23) show the epenthesis mentioned in note 3; and two of these show in addition the coloring of the epenthetic vowels (*u* by velars, *e* by palatals) mentioned there. This epenthesis and coloring also occurs in the form for 'rain' in (24b).

[29] This follows the normal pattern of pluralization of native *-l* final stems, namely, glottalization of the final *l*, as in *p'eχal*∼*p'eχaʔl* 'hat (SG/PL)' (see also footnote 2 on glottalized *n*). Russian loanwords in *-l* always pattern instead as zero class nouns (see below). Volodin (1976) notes only one native Itelmen *-l* final word in which pluralization follows the zero class pattern; in my field work with a generation later, more words pattern as zero class nouns, at least for some speakers.

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(24)	(a)	atx-atx	'light' NOUN.SG	atx-laχ	'white'	ADJ
		txun-txun	'darkness, night'	txun-laχ	'dark'	ADJ
	(b)	pilβe-pil	'hunger'[30]	pilβet-kas	'to starve'	VERB
		čux^{w}-čux^{w}	'rain'	čx^{w}-əzin	'it is raining'	VERB
	(c)	(ə)mč'-emč'	'rowanberry'	mč'-eʔn		PL
				əmč'-laχ	'bitter'	ADJ

In marking the singular only of a singular–plural alternation, reduplication in Itelmen appears to function as one of the noun class markers in the language. Other noun class markers are given in (25).[31]

(25)	UR	SINGULAR	PLURAL	GLOSS
-Ø	/kist/	kist	kist-eʔn	'house'
	/laχsx/	laχsx	laχsx-eʔn	'mother'
	/nənč/	nənč	nənč-iʔn	'fish'[32]
-m	/txtu/	txtu-m	txtu-ʔn	'dugout canoe'
	/atno/	atno-m	atno-ʔn	'village' (also 'home')
-n	/kəmlo/	kəmlo-n	kəmlo-ʔn	'grandchild'
	/reβla/	reβla-n	reβla-ʔn	'falcon'
-ŋ	/qtχa/	qtχa-ŋ	qtχi-ʔn	'leg'
	/iʔleβeno/	iʔleβeno-ŋ	iʔleβeno-ʔn	'boat pole'
-č	/p'e/	p'e-č	p'e-ʔn	'child, son'
	/xk'i/	xk'i-č	xk'i-ʔn	'hand'

That these alternations are not merely the result of a phonological rule is evidenced by the behavior of stems that do end in these consonants, but which retain the consonant in the plural. These are particularly numerous for *-č*, where alongside *p'e-č ~ p'e-ʔn* we find, for example, *nuč ~ nuč-eʔn*

[30] The account given here would appear to predict **pilβe-pilβ* for the first form in (24b), by full copying, plus apocope. Note, however, that the final cluster *-lβ#* is ill-formed, as glides must be adjacent to a vowel, see footnote 16 above. Illicit clusters with unsyllabifiable resonant consonants (liquids, nasals and /z/) are normally repaired by epenthesis, whereas it appears that the offending glide in (24b) is deleted. However, this may be a peculiarity of the reduplication context, rather than a resonant–glide distinction; see footnote 6 above.

[31] Volodin (1976) gives *-lŋin* and *-miŋ* as class markers; these may in fact be derivational affixes. I have followed Volodin in listing *-n* as a class marker, though for this segment there is an alternative analysis under which /n/ is part of the root, and the plural affix is simply glottalization, parallel to the treatment of *-l* final nouns discussed in footnote 29. Whether the final *-n* is a class marker or part of the stem should be empirically decidable. The outcome is not relevant to the current discussion, although footnote 36 may suggest that the phonological account for the *-n* final nouns is superior.

[32] The quality of the vowel in the plural morpheme is not always clear, though it is always /e,i,a/ or schwa. There appears to be both inter-speaker and inter-transcriber variation, and I therefore set aside further discussion of the issue. Note that the vowel is not part of the stem – other diagnostics such as the diminutive suffix (see section 4) unambiguously identify these roots as being phonologically consonant-final.

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'door', *čkpəč ~ čkpč-eʔn* 'spoon', and many others. (Final *-ŋ*, however, is always a class marker.)

Further evidence that the final consonants in (25) are class markers, lost in the plural rather than deleted by phonological rule, can be found in their interaction with oblique cases.[33] Class markers are retained before all oblique case endings in the singular, but are systematically absent in the plural. This is illustrated in (26). The class markers are even retained before case endings (such as the circumfixal comitative) where the plural marker is deleted (yielding singular–plural syncretism in the zero class), as in (26b).

(26) (a) 'sled runner'

SG sxli-ŋ	LOCATIVE: sxli-ŋ-enk	COMITATIVE:	k-sxli-ŋ-eł
PL sxli-ʔn	LOCATIVE: sxli-ʔnk	COMITATIVE:	k-sxli-ł

(b) 'friend'[34]

SG ipłx-Ø	LOCATIVE: ipłx-Ø-enk	COMITATIVE:	k'-ipłx-Ø-eł
PL płxa-ʔn	LOCATIVE: płxa-ʔnk	COMITATIVE:	k-ipłx-eł

This is also the most common pattern with reduplication (at least for monosyllabic roots), as shown in (27), confirming that the reduplicant is to be treated as one of the singular class markers.[35]

(27) 'claw, nail'

SG k'uΦ- k'uΦ	LOCATIVE: k'uΦ-k'uΦ-enk
PL k'Φə-n̓	LOCATIVE: k'Φə-ʔn-k

These considerations suggest that the reduplicating affix -RED should be added to the list of class suffixes in (25).[36] Treating -RED as a declension

[33] Due to a lack of relevant data in the material I have collected, I have relied on Volodin (1976) for the discussion of oblique case endings for noun class markers and reduplication.

[34] This is the only form for which a complete relevant paradigm is given in Volodin (1976), although it is complicated by the stem alternation *ipłx ~ płxa*.

[35] Unfortunately, the available description of the oblique case forms of the partial reduplication cases such as (1b) is incomplete and somewhat inconsistent. Volodin (1976: 109) states that 'the few cases of partial reduplication give the same picture in the oblique cases as in Chukchi and Koryak – reduplication takes place only in the citation form'. However, the example he gives does show partial reduplication in the singular oblique cases, like (27), albeit reduplication of only the first consonant of the base:

(i)

SG misxu-mis	LOCATIVE: misxu-m-enk	DATIVE: misxu-m-anke	
PL misxu-ʔn	LOCATIVE: misxu-ʔnk	DATIVE: misxu-ʔnke	

The two cases of total reduplication in disyllabic (closed) bases discussed in section 2 do not behave in this manner, showing no reduplication before oblique endings.

[36] There is one problem with this account if *-n* is a class marker (but not if the glottalization of *-n* stems is phonological, as suggested in footnote 31). Reduplicating stems that end in *-n* lose that *-n* before the plural suffix, thus singular *kunkun* has plural *ku-ʔn* 'cedar cone' (reduplicating *-l* stems behave this way, though that is expected, as *-l* is not a class marker).

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class marker (diacritic), rather than as a morpho-phonologically determined process, is also consistent with the absence of any semantic or phonological coherence to the group of reduplicating nouns. Like other diacritic distinctions, class membership is in flux, and nouns reported as reduplicating in Volodin (1976) do not always undergo reduplication for the younger speakers with whom I have worked. Even in Volodin's material, there are nouns which undergo no alternation and may be thus treated as lexicalized roots, historically reduplicating, but synchronically in the zero suffixing default class.

This is presumably an unsurprising effect of language shift, as Itelmen has taken a back seat to Russian as the dominant language of communication for all of the fewer than 40 remaining Itelmen speakers. An example of (what I treat as) a lexicalized form is given in (28), the name for a type of seal.[37]

(28) *Sedanka* SG: βitβit PLURAL: βitβit-eʔn '(ringed) seal'
Khairjuzovo SG: Φitβit PLURAL: Φitβit-eʔn '(ringed) seal'

There is no obvious phonological reason why the plural should not be **βit-eʔn* on the model of other monosyllabic reduplicating stems. Thus, while historically derived via reduplication, synchronically this behaves as an unanalyzed root, *βitβit*, belonging to the default noun class (zero singular) to which the plural ending is added directly. Note also that the phonological change devoicing stem-initial fricatives, an innovation of the Khairjuzovo and other Southern dialects of (Western) Itelmen, has applied only to the first consonant of the root.

In sum, given the available evidence, the suffix -RED appears to have the distribution of a singular class marker, on a par with the other suffixes in (25).

Reduplicating stems in *-m* never lose the *-m* in the plural (Volodin 1976: 126). The plural of *qeβuŋ-qeβuŋ* also loses the final *-ŋ* (cf. the behavior in oblique cases mentioned in the previous footnote). Volodin gives no examples of plurals of *-ŋ* final monosyllabic reduplicating stems, which would be important in determining the issue of the final consonants here.

Note that Volodin also gives two reduplicating forms which involve reduplication of an open CV root, followed by a class marker. Both the reduplication and the class marker are lost in the plural, arguing against a lexicalization treatment. The nouns are *č'e-č'e-m* ~ *č'e-ʔn* 'purple willow' (Russian *taljnik*) and *t'i-t'i-m* ~ *t'i-ʔn* 'smoke'. For this pair of nouns, reduplication cannot be considered as a class marker.

[37] The alternating pattern seen in (23), and its occurrence throughout the singular declension (as in (27)), are distinctive of Itelmen. In Chukchi (see Krause 1980: 157) full reduplication of CVC stems occurs throughout the nominal declension, given the model of the lexicalized forms like (28). Partial reduplication like (2) is used exclusively in the absolutive singular.

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5.2 *RED-loanword incompatibility*

The preceding section presented an argument that a morpheme -RED is to be recognized as one of the class markers of Itelmen. Although the class of roots which -RED attaches to is small, all reduplicating disyllabic stems in an open syllable are subject to the apocope rule. This means that there are no Itelmen nouns which combine the properties of being loanwords (hence permitting a final vowel) and undergoing reduplication. Stratification of the lexicon has the potential to explain this gap, since the morpheme -RED and the apocope rule would be part of the same co-phonology, in Itô & Mester's terms, and thus part of the core stratum of the Itelmen lexicon. Within the alternative approach (cf. Inkelas et al. 1997), this gap must arise as a historical accident.[38]

There is one tantalizing morsel of evidence which suggests that the incompatibility between -RED and borrowed stems is not an accident. I have presented above a number of phonotactic identifiers indicative of membership in a non-core stratum, i.e., loanword status. Among these identifying characteristics were certain initial segments, including the palatals *lʲ-*, *nʲ-* and *j-*. The stratification approach thus predicts that no noun can simultaneously occupy two strata, and hence that no noun can begin with one of these segments and yet undergo reduplication. We retun to Volodin & Khaloimova (1989) as our vocabulary source. From among words beginning with one of the three palatal segments, there is one candidate counter-example, a word that, in the singular, looks as if it has regular CVC–CVC reduplication.[39] Yet, as Volodin (1976: 109) notes, this word falls exactly into the class that I have treated as lexicalized, with the putatively reduplicated form never alternating with a non-reduplicated base; see (29).

(29) jaqjaq 'seagull' PL: jaqjaq-aʔn SG LOCATIVE: jaqjaq-aʔn-k, etc.

The singular form *jaqjaq* looks like an excellent candidate for treatment as a regular reduplicating root. Nevertheless, it was not borrowed as one, and was borrowed instead as an unanalyzed whole, assigned to the zero

[38] Note that it is not the case that all borrowings are assigned to the default (Ø) class. Clear Koryak loanwords (according to the criteria set out here) belong to the *-m*, *-n* and *-ŋ* classes, for example, *jaja-ŋ* 'cloud', plural *jaja-ʔn*. A small number of loanwords are also assigned to the *-č* class, including *oknu-č* 'window' (pl. *okno-ʔn*) < Russian /okno/.

[39] There is an additional form, *joβajoβ* 'loon', given in Volodin (1976: 108) (cf. Koryak *jovajow* in Moll 1960). This looks like partial reduplication (hence apocope), but it occurs together with the palatal onset indicative of borrowing, which would falsify the hypothesis set out in this subsection. Unfortunately, no plural is given. In subsequent work (Volodin & Khaloimova 1989), where the plural is given as unreduplicated *joβa-ʔn*, the singular, *joβ-aj*, also lacks reduplication (*-aj* is a pejorative suffix, which occurs as a conventionalized suffix on many animal names).

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class of nouns. The lexical stratification approach suggests that this was the case because it could not have been otherwise: the initial *j-* marks this as unambiguously not part of the Itelmen core vocabulary, and hence it could not be analyzed as a combination of a root /*jaq*/ plus suffix -RED. The two cannot combine. Plausibly, the same account extends to why Koryak *ŋej-ŋej* 'mountain' is not borrowed as a synchronic reduplicating form in Itelmen, but rather as an (exceptional) vowel-final noun *ŋejŋe*, as in (14) above.

6. Conclusion

In the present paper, I have explored the consequences of attempting to maintain the universal nature of Edge-In reduplication in the face of apparent counter-evidence from Itelmen. I suggested that the existing account of apparently similar examples in Chukchi could be extended to Itelmen, in the form of an apocope rule that deletes stem-final vowels word-finally. The majority of the paper pursued the consequences of this approach, in particular, the plausibility of dealing with apparent exceptions as loanword phenomena. While the class of relevant material is small, and the available data is inconclusive in certain respects, I hope to have demonstrated that the apocope approach has interesting consequences for our understanding of Itelmen phonology beyond the question of direction of association in reduplication. It just may also have consequences for our understanding of the representation of loanwords in the phonological lexicon, in the manner touched on in the final section. In the background throughout has been the alternative – to reject the apocope and loanword solution along the lines developed here would leave Itelmen as a true counter-example to an otherwise persuasive phonological universal.[40]

[40] A *JL* referee suggests that the material presented here may also bear on the choice between a derivational and a fully-parallel model of phonology, such as OT. The question revolves around how universals are to be dealt with. In a serial model, one can speak of Edge-In as holding universally, at the point in the derivation where association applies (even if it is not surface true, owing to the application of subsequent phonological processes). The referee questions whether classic OT has the resources to mimic this argument. Insofar as I understand the issue, it may, but the burden will lie on the inventory of constraints that make up UG; there must be a constraint that will favor Edge-In association (I suspect Base-Reduplicant Identity will have this effect, so long as precedence relations among segments are part of the input), and while this constraint may be ranked and violable, there must be no constraint in UG that could ever favor wrong-side reduplication, for example, an alignment constraint that enforces left-to-right association generally, able to apply even in suffixes. Nelson (2003) argues that the (qualified) validity of Marantz's Generalization would bear, within OT, on the inventory of possible constraints admitted by UG in this manner. I leave this issue open.

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