Shuswap Vowels and Proto-Salish: from an Athapaskan point of view

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1. The phonemic status of pharyngealized consonants and their effect on vocalic alternations either allophonic or morphophonemic are well-documented for Interior Salish, although no uniform terms have been used to describe the alternating vowel qualities or the processes. In one of the earliest descriptions of this phenomenon, Reichard (1938) noted in Coeur d'Alene two systematically alternating vowel qualities, one of which, conditioned by a following uvular consonant (e.g. q, q', r, R, etc.), was called 'faucally weakened' as against the 'strong' vowel quality, not affected by the uvualrs. The function of pharyngealization has become clearer in more recent studies of two northern interior Salish languages, Thompson (Thompson and Thompson Ms.) and Lillooet (van Eijk 1985), in which the 'retracted' phonemes include not only uvulars but also postdentals and/or laterals. Interestingly, an essentially identical type of consonantal phonemic opposition is found in Chilcotin, and similar vocalic alternations conditioned by consonants in Babine raise a number of interesting questions (see below) which might bear on the origin of pharyngealization in this language area.

The purpose of this paper is to examine the parallel vocalic alternations at the phonetic level (allophonic) and at the phonemic level (morphophonemic) in Shuswap, then to compare these alternations with parallel alternations in Babine and Chilcotin, and then to see what implications these vocalic alternations might have on the reconstruction of Proto-Salish.

2. Kuipers (1974) postulated five full vowels and two reduced vowels for Shuswap as shown in table 1. Of the two reduced vowels, the synchronic and diachronic status of caret is most unclear, and schwa most often represents a full vowel in unstressed syllables, although evidence for its independent status is also available.

Vowels (V)	Front	Central	Back-Rounded
Open		a	
Mid	e	(ʌ)[1] ə[2]	o
Close	i[3]		u[3]

[1]Very rare.

[2]In unstressed syllables only.

[3]In stressed syllables only.

Table 1.

Kuipers' phonetic descriptions of vowels are very sketchy, but paragraph 2.4 cited below gives major allophonic variations.

> 2.4 The stressed vowels have the following main variants: i=[i/e], u=[u/o], o=[ɔ], e=[ɛ], a=[a], ʌ=[ʌ]. Before rounded velars u=[ʊ]. After uvulars e=[æ] and i is usually slightly diphthonal [ɛɪ], except if followed by another uvular or uvularized resonant. Before uvulars, and before and after uvularized resonants i=[ɪ/ɛ] u=[ɔ], e=[æ/a] (hence the neutralizations 1.7.2).

Ignoring caret and schwa for now, I have organized the two types of vocalic qualities in (1) below for ease of comparison.

(1) a. underlying

i=[i/e] u=[u/o]
e=[ɛ] o=[ɔ]
a=[a]

b. pharyngealized

i=[ɪ/ɛ (ɛɪ)] u=[ɔ]
e=[æ/a]

Stated in terms of distribution, only three vowels in set (b) may occur next to a uvular while all five vowels in set (a) occur elsewhere. The skewed distribution of the vowels in pharyngealizing environments is due to neutralization, as Kuipers put it, or phonemic overlapping observed in set (b). For example, the phone epsilon is an allophone of *e* in set (a) but an allophone of *i* in set (b), i.e. phonemes *i* and *e* are neutralized next to a uvular consonant. Similarly, [ɔ] represents the mid back vowel phoneme in set (a), but the high back vowel in set (b). Another set of vowels that are supposed to be neutralized are *e* and *a*, but this pair does not fit into the pattern of the other neutralizing pairs because of [æ] which is apparently seen as alternating with [a] in set (b). In the neutralization of the other two pairs, the phone that actually represents the neutralized phonemes is the lower of the two,although the phonemic identity is given for the high vowel. For example, *i* and *e* neutralize in [ɛ] rather than in [e]. Similarly, *u* and *o* neutralize in [ɔ] rather than in [o]. From these we can expect that *e* and *a* neutralized in [a]. Then how can we explain [æ]? If these neutralizations are seen as a consequence of pharyngealization, i.e. retracted tongue root, the occurrence of [æ] in the pharyngealizing environment vis-à-vis [a] in the nonpharyngealizing environment begs a question. In Chilcotin, [æ] and [a] are allophones of one phoneme, of which the latter is restricted to the pharyngealizing environment. There is asymmetry in the neutrlization of vowels in that *e* neutralizes with *a*, but there is no vowel that the mid back vowel neutralizes with. If *a* is a nonback vowel, the lack of its back counterpart might explain the asymmetry. On the other hand, this answer is not satisfactory if the process is seen as a phonetic consequence of pharyngealization in that where *e* is pharyngealized to [a], *o* must be similarly pharyngealized to [ɒ]. This reasoning leads to a proposal that [æ] and [a] in set (b) do not correctly represent the phonological relationship. A more likely relationship of the two alternating vowel qualities may be better illustrated by the following display, which remarkably resembles the phonological relationship of Danish vowel qualities in comparable environments (Martinet 1947).

(2) **Underlying** **Pharyngealized**

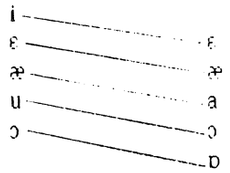

Table 2. Shuswap vocalic qualities.

From a comparison of (a) and (b) above, it is obvious that the one that occurs in the restricted environment is lower, more close, and more back than the corresponding quality in the "elsewhere" environment. A similar type of vocalic alternation also exists in morphophonemic alternations.

As Kuipers noted, the Shuswap vowel phonemes excluding schwa are divided into two categories: (i) *i e u*, which are 'most frequent and least limited in distribution, and (ii) *a o ʌ*, which occur 'almost exclusively near l l', or less often near m t'.' The qualities of these two sets of vowels are distinguished in the same manner as the two allophonic qualities shown in the preceding paragraph. This pattern of distribution is of course not accidental. Kuipers (1974) viewed that the 'darkened' vowels (a e o) historically derive from *a, *i, and *u respectively preceding *r which was believed to have merged with *l in contemporary Shuswap as illustrated by the following:

(3)	PS	Shuswap	PS	Shuswap
	*il	> il	*al	> el
	*ul	> ul	*ir	> el
	*al	> al	*ur	> ol
	Unchanged		**Changed**	

The merger of two liquids have resulted in the split of three full vowels into five vowels. This view, however, is apparently changed as indicated by Kuipers (1982) which will be discussed shortly. In the mean time, I shall comment further on the vowel qualities of two sets of vowels. As noted earlier, Kuipers recognized *a, o,* and *ʌ* as a set of distributionally restricted vowels, and caret is the darkened counterpart of schwa (as implied in Kuipers 1982). This set is equivalent to the darkened set, of which *e* is sort of a neutral vowel as it belongs to both dark and nondark sets. If the historical derivation of the five vowels is what is indicated by (3), *e* derives from *i darkened by *r or from *a in a syllable closed by *l. I shall comment on this further in the last section.

Kuipers observed a fair amount of regularity in the morphophonemic alternation of the three pairs of vowels as illustrated by the lexical suffixes in (4).

(4) a. *e* vs. *a*: -ekst vs. -askt 'hand, arm'
b. *u* vs. *o*: -us vs. -os 'face'
c. *i* vs. *e*: -cin vs. -cen 'mouth'

What should be obvious at this point is that the relationship of each pair of alternating vowels (i.e. dark vs. nondark) in the morphophonemic alternation is parallel to that in allophonic alternations both in terms of vowel quality involved and their distributional privileges. For example, just as *i* and *e* are neutralized in the pharyngealizing environment *i* and *e* alternate morphophonemically where the darkened member occurs in a restricted environment. Then, the morphophonemic alternation is a vestige of a regular allophonic alternation of an earlier period.

Aside from the suffixes that have alternating vowels, there are also suffixes with only a darkened ('unmotivated') vowels. In the presence of uvulars, particularly pharyngealized resonants in all Interior Salish (Kinkade 1967), PS *r or one of the laterals instead of *r as well as the pharyngeal proper (Kuipers 1973, Kinkade and Thompson 1974, Mattina 1979) was taken implicitly or explicitly the source of pharyngealized vowels in contemporary languages. But the abandonment of *r and more significantly the discovery of retracted postdentals (and laterals) in Thompson and Lillooet have complicated the matter, particularly with respect to the source of retracted consonants as well as unmotivated darkened vowels.

3. Thompson (1979) summarized his view on the phonemic inventory of Proto-Salish in a chart cited in table 2. This inventory compares well with the one proposed by Kuipers (1978) except for a distinctive feature 'darkened' included in the latter.

(p)	t	c		k	kʷ	q	qʷʔ	
(p')	t'	c'	ƛ'	k'	kʷ'	q'	qʷ'	
	s		ɬ	x	xʷ	χ	χʷ	h
(m)	n	(r)	l	ʔŋ	ŋʷ	ʁ	ʁʷ	ʕ
(m')	n'	(r')	l'		ŋʷ'	ʁ'	ʁʷ'	ʕ'
				y	w			
				y'	w'			
				ɪ	u			
				ə				
				a				

Proto-Salish: Thompson 1979.

Kuipers (1978) postulated the feature 'darkened' to account for three interconnected sets of facts: (a) distinctive darkened...vowels in IS... (b) two distinct varieties of *l* in Lill... (c) two distinct varieties of *c, s* in Lill. and Thom... Since then, Kuipers continued to use three or four dark vowels, *ᵊ, (ᵊi), ᵊu, ᵊə*, in his reconstructions, but he has not offered convincing systematic correspondences, nor exhausted alternative analyses in his 1978 paper or 1981 article. Since this proposal for pharyngealized PS vowels presents an entirely new view on the origin of the pharyngealization, I will review this proposal from an Athapaskan point of view with general phonological processes in mind.

The most explicit statement that I can find on this proposal is in Kuipers (1982:72), which I quote below.

'Separate darkened (retracted, pharyngealized) vowels *ᵊa *ᵊu *ᵊə have to be posited for PS to account for the timbres [a ɔ ʌ] (vs. plain [æ u ə]) in a number of IS languages... There are clear indications that PS *a ą u ų i* were, if not phonologically identical with, then at least etymologically related to PS *ʔ q̓ w̓ q̓ʷ y*...

'PS *r is eliminated in favour of *l (retracted to [ɭ] in roots with darkened vowels: under the same conditions *c *s had retracted variants [ç ʂ].'

The most important point that follows this proposal is that retracted consonant phonemes have emerged rather recently via phonologization of allophonic variations that were conditioned by retracted vowels. This is a complete reversal of the view held by leading Salish scholars in general including Kuipers himself. The ultimate proof of this new proposal will have to wait for a more thorough comparative analysis. While I am unable to judge the comparative data contained in Kuipers' paper (1982), it is not obvious to me why retracted vowels, instead of retracted consonants, should be postulated for Proto-Salish. In the meantime, I offer Athapaskan data which show a parallel vocalic alternation, which might illuminate the problem from another perspective.

Since I have presented the details elsewhere (Cook 1983, 1984, 1987) of the parallel characteristics of pharyngealization between Interior Salish and two Athapaskan languages, I will present here only a few typical examples that directly bear on relevant points. The data given below illustrate the two alternating vocalic qualities, of which the flattened qualities are restricted to the pharyngealizing environment just like the darkened Salish vowels are.

(5) a. [u] vs. [o]: k'un [k'un] 'roe' vs. sæqud [saqʰot] 'shadow'
b. [æ] vs. [a]: kæyæyu [kʰæyæyu] 'credit' vs. qænis [qʰanic] 'spoon'
c. [i] vs. [ɘi] : -tsi 'grandfather' vs. -tŝi [tʂʰi] 'head, tŝ'iqi [tʂ̓ɘqʰi] 'woman'

The retracted postdentals as well as velars and uvulars of Chilcotin and Thompson are remarkably comparable, and there is no documented evidence that any other Athapaskan language except Babine has a similar phonemic opposition based on a pharyngeal or tongue root feature. It is clear in Chilcotin that the vocalic alternation is conditioned by retracted consonant phonemes, and there is no evidence for a retracted vowel phoneme in any Athapaskan language. On the other hand, there is evidence that the distinctive pharyngeal feature is being

shifted to the vocalic system, i.e. the two allophonic vowel qualities are becoming phonologized. Consider the following data.

(6) a. [bilo] <— 'biluɣ 'knife'
[ɬidâ] <— 'ɬidæny 'last night'
b. [nəɬəi] <— 'næŝɬiny 'horse'
[ɬtŝ'anən] <— 'əɬtŝ'æêɲæn 'ten'

A small number of these lexical items constitute counterexamples to the rules that pharyngealize or 'flatten' the underlying vowel qualities, i.e. the vowel qualities of the above data are opaque because there is no retracted consonant to trigger pharyngealization on the phonetic surface. The forms on the right of the arrow are postulated via internal reconstruction. These forms contain retracted consonants which are attested by cognates. These reconstructed forms may or may not be acceptable as underlying representations, but they clearly reveal an interesting fact, and that is that the pharyngeal feature which was associated with the deleted consonants is now associated with a neighbouring vowel. In (a) the final velar flattens only the immediately preceding vowel, whereas in (b) the retracted sibilant flattens all the vowels in the word (see Cook 1983, 1987). In other words, the pharyngeal feature is floated away from the retracted consonant and docked on a neighbouring vowel, a phenomenon comparable to tone stability. The data given above clearly signal that a significant phonological change is being initiated, which might eventually lead to the increase of vowel phonemes and decrease of consonants. One might argue that the flattened vowels in (6) have already gained a phonemic status as they cannot be predicted without recourse to an abstract consonant. But there is not a single minimal pair that shows a contrast between a flat vowel and its nonflat counterpart, and the phonological system would be extremely complicated if the flat vowel qualities are granted phonemic status.

Babine phonology offers more interesting parallels although the consonants that trigger the alternation are not uvulars or postdentals, but a class of 'fortis' consonants that include two obstruent series, the aspirated and glottalized, and the voiceless fricatives. According to Story (1984), Babine consonants are divided into two natural classes based on the vocalic alternation to be discussed shortly.

a.	b	d	dl	dz	g/dž	G	G^w	
b.		t	tɬ	ts	k/tš	q	q^w	
c.		t'	tɬ'	ts'	k'/tš'	q'	q^w'	ʔ
d.	m	n	l	z	ɣ	ɣ	w	
e			ɬ	s	x	χ	χ^w	h

Fortis class: b, c, e.

Lenis class: a, d.

Table 3. Babine Consonants.

The two alternating allophonic qualities are shown in table 4 below. The two vocalic qualities of each vowel phoneme are mutually exclusive: the lenis quality occurs in the lenis syllable and the fortis quality in the fortis syllable where the two types of syllables are marked by a lenis onset consonant and fortis onset consonant respectively.

a. Lenis syllable:	i	e	æ	o	u	ə
b. Fortis syllable:	e̱	ɛ	a	ɔ	o̱	ʌ
	1	2	3	4	5	6

Table 4.

One question to be raised at this point is whether or not the fortis consonants are actually pharyngealized and how they are comparable to the retracted consonants of Interior Salish and Chilcotin. This question is not easy to answer without detailed acoustic and articulatory studies. But notice the following facts. First, the phonetic feature common to the three series of Babine fortis consonants is the laryngeal feature, either spread or constricted glottis. There is clearly an intimate interaction between the laryngeal and pharyngeal mechanism. Second, the vowel qualities in fortis syllables are clearly retracted according to Story (1984). Third, a similar vocalic alternation conditioned by similar syllable initial consonants is observed among the Mon-Khmer languages (see Gregerson 1976, Cook in press).

What is remarkable in Babine phonology is that the same type of vocalic alternation exists also at the morphemic level as well as in the historical change. As illustrated by the examples given in (7), the morphophonemic alternation of two vowels exactly parallels the allophonic alternations where the syllable without an onset is equivalent to a lenis syllable.

(7) a. e/a	b-ẹn	'his mother'	s-an	my mother'
	b-eq'əy	'his aunt'	s-aq'əy	my aunt
b. i/e	b-ini	'his brain'	s-eni [sɛni]	my brain'
	bə-zi	'his belt'	se [sɛ]	belt'
	s-ɣɪ	my grease'	xe [χɛ]	grease'

The historical change of vocalic qualities from Proto-Athapaskan to Babine is described by Story in terms of 'F-mutation' and 'L-mutation' by which PA vowels are either lowered or raised respectively, e.g.:

(8) a. F-mutation

	F-initial		**L-initial** (no change)	
PA *i > Babine əy	səy	I	-dis	turn
	ts'əy	canoe	-ni	say
PA *u > Babine o	to	water	nu	island
	ɬod	scab	-ɣu	tooth
	tɬ'oɬ	rope	-ɣuɬ	blow

b. L-mutation

	L-initial		**F-initial** (no change)	
PA *e > Babine i	-di	horn	ɬes	flour
	-ɣɪs	egg	qe	foot
	dzin	'day'	t'es	charcoal
PA *a > Babine e	-de	lip	tsa	beaver
	-le	hand	-ʔad	wife
	ye	louse	sa	sun

The relationship of the vocalic qualities involved in the three levels (allophonic, morphophonemic, and diachronic) can be summarized by the following equation: [i]:[e]=/i/:/e/=*i:/ey/.

Two things may be emphasized with respect to what has been demonstrated by the Babine data. First, the synchronic alternations are vestiges of the diachronic processes. Second, consonants colour the vowel qualities, but not vice versa. Of course, this does not prove that the same historical process has occurred in Interior Salish, but those points observed in Babine (and in Chilcotin) raise serious questions with respect to the darkened vowels postulated by Kuipers vis-à-vis synchronic processes. There is ample evidence, albeit unmotivated dark vowels, in Interior Salish that vowel qualities are conditioned by pharyngealized consonants. This is not the vestiges of an old process if Proto-Salish had dark vowels which conditioned consonantal allophony. If so, how has the reversal of the process happened? If Kuipers (1982) is correct, two stages are involved: an earlier stage, i.e. Proto-Salish, in which vowels coloured consonants, and a contemporary stage in which consonants colour vowels. On the other hand, if we assume that the contemporary vowel colouring is the ongoing process initiated earlier in the PS period, no reversal of the process is required to explain the historical development. Consequently, this clearly indicates where the burden of proof lies.

The second question is: how likely does a distinctive feature of a vowel transfer to a consonant? There is ample evidence not only from Athapaskan, but also from many other languages, that consonantal features, particularly that of a coda, is shifted to the tautosyllabic

vowel (i.e. coarticulated), e.g. nasalization (Vn —> $\tilde{V}$n —> $\tilde{V}$), vowel constriction (V$\hat{\imath}$ —> $\hat{V}\hat{\imath}$ —> $\hat{V}/\hat{V}$), monophthongization (ay —> e), etc. Furthermore, Ohala and Kawasaki (1984) provide an interesting phonetic explanation why V is more likely to be coloured by C than vice versa. Needless to say, Interior Salish may have followed a less likely course of sound change; if so, an explanation is in order.

A last point to be noted here is yet another parallel between Shuswap and Babine, if Kuipers' earlier (1974) view is correct. As shown in (3), the syllables closed by *r are 'F-mutated' while those closed by *l are 'L-mutated' if Story's Babine terminology is applied. Could this be just another coincidence?

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