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INTERIOR SALISH EVIDENCE FOR PLACELESS LARYNGEALS*

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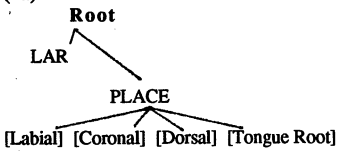
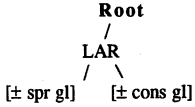
In many languages of the world the laryngeal segments ʔ and h pattern differently from other consonants. Most articulation-based models, such as that of Sagey (1986), which is represented in (1a), have encoded the particular distinctness of laryngeals by assuming that they are uniquely characterized by having only Laryngeal specifications, where Laryngeal is a daughter of the Root Node (see also Clements 1985, Steriade 1987*etc.*), as in (1b).[1]

(1a) *Articulation model*



(1b) *Placeless Laryngeals*



Recently, McCarthy (1989, 1991) and Hayward and Hayward (1989) have provided very interesting and important arguments that in some Semitic languages

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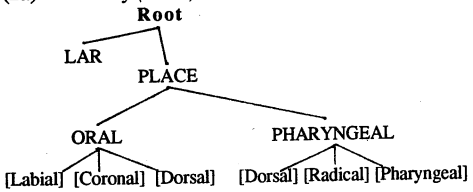
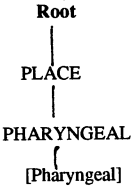
[1] For various articulation-based models see, for example, Archangeli and Pulleyblank 1989; Clements 1985, 1990; Gorecka 1989; Halle 1989; McCarthy 1989; E. Pulleyblank 1990; Sagey 1986.

the /ʔ/ and /ħ/ form a natural class with pharyngeals and (some of the) uvulars for purposes of a number of phonological and morphophonological constraints and processes. This class is traditionally referred to as the guttural class. To account for the guttural patterning of the Semitic laryngeals within an articulation-based feature geometry, McCarthy argues that unlike laryngeals in most languages guttural laryngeals are not placeless. He proposes instead that guttural laryngeals, pharyngeals and (some) uvulars are defined by a place of articulation, which he calls Pharyngeal. In his 1991 model the Pharyngeal POA is distinguished from an Oral POA which dominates the Labial, Coronal and Dorsal articulators. Pharyngeal POA dominates Pharyngeal, Radical and Dorsal articulators as in (2a); his representation of laryngeals is given in (2b):

(2a) *McCarthy (1991)*



(2b) *'Guttural' Laryngeals*



In addition to the Semitic evidence for guttural laryngeals, Shaw (1991) has also argued persuasively that Nisgha (Tsimshianic) has both laryngeals which pattern with the uvulars, and should be represented with a Pharyngeal node, and Placeless laryngeals.

The fact that Semitic and Nisgha laryngeals pattern with other postvelar segments raises the question of whether there is a relationship between the presence of uvular and pharyngeal segments in an inventory and the phonological properties of laryngeals. In the first part of this paper we consider this question by examining non-laryngeal and laryngeal postvelar segments in four Interior Salish languages. We show that although the Interior Salish languages have extensive postvelar inventories, the laryngeals /ʔ/ and /ħ/ do not pattern together either phonetically or phonologically with the other postvelars. We thus conclude that there is no necessary relation between the presence of postvelars in an inventory and the guttural behaviour of laryngeals. This is in accord with McCarthy's (1991) conclusion that languages choose whether their laryngeals are guttural and therefore Pharyngeal. We then argue, particularly on the basis of evidence from Nxa'amxcin, or (Moses-)Columbian Salish, that Interior Salish laryngeals are placeless as in (1b). Finally, we consider briefly whether the guttural patterning of Semitic and Nisgha laryngeals could be accounted for without assuming that these laryngeals have a Pharyngeal specification, thus avoiding the need for stipulation.

1. Preliminaries

The four Interior Salish languages from which we draw data are given in (3), with their English and native names, and the sources of our data.

(3) *Languages Under Consideration*

Cm	Moses-Columbia Salish	Nxa'amxcin	Field notes: Kinkade Bessell/Czaykowska-Higgins
CdA	Coeur d'Alene	Snčicu'umšcn	Reichard 1938, 1939
Li	Lillooet	Sƛ'aƛ'ímxcin	van Eijk 1985, Remnant 1990
Th	Thompson	Nɬe'kepmxcin	Thompson & Thompson 1986

As the composite consonant inventory in (4a) illustrates, all four of these languages have six uvular segments and four voiced pharyngeals. Cm also has two voiceless pharyngeals. All four languages have retracted alveolars, whose articulation involves tongue root retraction (indicated by an underdot), although in CdA there is only one such consonant, namely [r̪]. The retracted alveolars resemble the emphatic consonants of Arabic in both phonological and phonetic properties, although it is unclear whether retracted alveolars are underlying in Interior Salish. The postvelar inventories of the four languages, then, are more extensive than, but similar to, postvelar inventories in Semitic languages.

(4a) *Composite Consonant Inventory* [2]

labial	alveolar				velar		uvular		pharyngeal		glottal
p	t	c (ç)	(č)		(k)	kʷ	q	qʷ			ʔ
(b)	(d)		(ǰ)			(gʷ)					
p̰	t̰	c̰	(č')	(ƛ')	(k̰)	k̰ʷ	q̰	q̰ʷ			
	s (s̰)		(š)	ɬ	x	xʷ	χ	χʷ	(ħ)	(ħʷ)	h
m	n		(z)	y l(ʎ)	(r r̪)	(ɣ)	w		ʕ	ʕʷ	
m'	n'		(z')	y'l'(ʎ')	(r')	(ɣ')	w'		ʕ'	ʕ'ʷ	

All four of the Interior languages have two sets of vowels, plain and retracted (see (4b)). In Cm [ə] is epenthetic and is not underlying; in CdA there are two underlying [i] vowels: one alternating with retracted [e], the other with retracted [a]:

(4b) *Vowel Inventories*

CM/LT				CDA					TH			
		Retracted				Retracted						Retracted
i	u	j	ụ	i_1	i_2	u	e	o	i	u	j	ụ
ə		ə̰				e		a	e	ə		ə̰
a		a̰								a		a̰

[2] CdA has b,d,gʷ,č,ǰ,č',š, r̪ but not k, k', ƛ'. Cm, Li, Th have ç ,ṣ ,ɬ,ɬ' (Cm and Li s=[ʃ], c=[tʃ]). Li and Th have ɣ('), z('). Cm has ħ, ħʷ. Symbols used are as follows: C'= glottalized consonant, ƛ'=[t'ɬ], ɬ= lateral (vls) fricative, [ɣ(')]= front velar spirant, Ç= retracted consonant, [z(')]= slit, nonstrident dental spirants, sometimes lateral.

2. Evidence for a Postvelar Natural Class

We turn now to phonological and some phonetic evidence that uvulars, pharyngeals, and the retracted alveolar segments function as a postvelar natural class in Interior Salish languages. We also show that laryngeal segments are not members of this postvelar class.

2.1 Coeur d'Alene

The most striking Interior Salish phonological evidence for the classhood of the uvulars (Q), pharyngeals (R) and retracted alveolars (Ç) comes from Coeur d'Alene (Bessell 1990). First, in CdA postvelars pattern together to the exclusion of other consonants in prohibiting the occurrence of /i/ and /u/ to their left in a root. Thus, Reichard's (1939) stem-list gives more than 700 roots, of which none contains a high vowel before a postvelar. (5a) shows the occurrence of /i/ and /u/ before pre-uvulars, (5b) that no root in which C_2 or C_3 is Q, R, or r̲ can contain a high vowel:

(5) *Vowel Occurrences in Roots of the Shape CVC (C)*

a. C_2, C_3 = pre-uvular[3]		b. C_2 or C_3 = Q, R, or r̲	
CiC(C)	208	CiC(C)	0
CuC(C)	89	CuC(C)	0
CeC(C)	222	CeC(C)	37
CoC(C)	13	CoC(C)	17
CaC(C)	50	CaC(C)	142

Second, CdA has a process of Regressive Harmony which is triggered by Q, R, or r̲ in roots or suffixes and causes retraction of the vowels to their left in a word. The underlined morphemes in (6a) surface in the unretracted, non-harmony forms as /u/, /e/ or /i/. However, as (6b) shows, when they are situated to the left of Q, R, or r̲ the vowels in these morphemes surface in their harmony alternants [o], [a] or [e]. Thus, for example, the root √čiš in (6a.iv) surfaces as [čéšalqʷ] in (6b.iv) under the influence of the uvular in the final suffix:

(6) *Regressive Harmony*

/i/ → [e/a] /u/ → [o] /e/ → [a]

a. Non-Harmony Forms:

(i) /čet-√yil'xʷ-ine?-en-cut/ [če(t)yíl'xʷine?encut] 'he covered himself with blanket'

(ii) /cen-√łeč-p/ [cenłéčp] 'string breaks'

[3]The 63 CoC(C) and CaC(C) roots in which C_2 and C_3 are not postvelars all trigger a Progressive Harmony process that causes vowels in suffixes to surface as retracted, and have been analyzed as having a floating retracted tongue root specification in UR (see Doak 1989, Bessell 1990). They are therefore not exceptions to the rule that only /i,u,e/ occur in pre-uvular roots.

(iii) /ʔec-ni?-√kus-elstsn/	[ʔeniʔkúselscn]	'his hair curls back from forehead'
(iv) /√čiš-t/	[čišt]	'it is long'

b. Harmony Forms:

(i) /čet-√xʷiṛ-iš-n-t-s/	[čatxʷéṛičnc]	'he stepped over him'
(ii) /t-cen-√ʕʷel-n-t-m/	[tcanʕʷélntm]	'it was closed off'
(iii) /ʔec-t-√kus-qin/	[ʔatkósqin]	'his hair is curled'
(iv) /√čiš-ilqʷ/	[čéšalqʷ]	'he is tall'

In CdA, then, the uvulars, pharyngeals and retracted *r* govern the quality of the vowel in roots and trigger a long-distance process of Regressive Harmony. In both cases, the adjacent or nonadjacent vowels preceding these postvelar segments surface as retracted rather than unretracted. If we examine the behaviour of the laryngeals, however, we see that they do not pattern with the uvulars, pharyngeals or retracted *r* in either case. Thus as the list in (7) shows, high vowels occur freely in roots where C_2 is either /h/ or /ʔ/:

(7) *Roots containing laryngeals in C_2 position*

CiC	34
CuC	6
CeC	7

Furthermore, laryngeals are never triggers of Regressive Harmony. Thus (8a) and (8b) show that laryngeals in roots do not trigger retraction in the preceding prefixes; (8c) that the laryngeal in the suffix -ine? does not trigger retraction of the root or of the prefix vowels preceding it:

(8) *Regressive Harmony: Laryngeals are not triggers*

a.	/čet-√ʔem-iš-n-t-s/	[četʔemísnc]	'he sat on it'
b.	/cen-√ʔim-et-n-t/	[cenʔímetənt]	'Wait for him!'
c.	/čet-√yil'xʷ-ine?-en-cut/	[če(t)yíl'xʷinеʔencut]	'he covered himself with a blanket'

In sumary then, although CdA groups uvulars, pharyngeals and the retracted *r* as a class for the purposes of a root MSC and Regressive Harmony, the laryngeals in the inventory are not included in the class defined by these processes.

2.2 Thompson and Lillooet

We turn now to two of the northern Interior Salish languages, Thompson and Lillooet. In these languages vowels directly adjacent to uvulars, pharyngeals, and retracted alveolars all surface as retracted in the sense that in their environments only the lower/more back variants of each vowel surface. In Th, for instance, the

underlying vowels /i,u,e,a,ə/ surface as [i, u, ɛ/ɛ̂, æ/a, ə/ɪˀ/u/ɨ], respectively in the environment of labials, velars, and alveolars. Before Q, R and Ç, however, the surface vowels are lower and/ or backer than their counterparts (Th retracted alveolars are: z(̡), l(̡), s̡, ç):[4]

(9) *Th Retraction before Q, R, and Ç*

a. /I/ -->[eˇ] / __Q, R	[ʔeˇq̊t] 'scraped off',	[cʔeˇʕʷ] 'bleed'
[eˀ]=ɨ / __Ç	[k̊ɬ]'m] 'cut several pieces'	
b. /u/ -->[oˇ] / __Q	[ʔoˇqʷeʔ] 'drink'	
[ɔ] / __ R, Ç	[pɔʕʷtés] 'knock on s.t.',	[c̊ʔɔz] 'get dark'
c. /e/ -->[æ] / __Q, R	[cʔæq] 'tamed, trained'	
d. /a/ -->[ɑ] / Q, R, Ç	[mɑʕ't] 'broken',	[χɑ́q̊es] 'pay',[s̡ɑw't] 'scratched'
e. /a/ -->[eˇˀ]/ Q, R	[ʕeˇˀk̊ʕeˇˀk̊] 'squeaking shoes',	[q̊ʷeˇˀq̊ʷúʔɬ] 'bone'
[ʌ] / __ Ç	[mʌ́zə] 'house fly',	[k̊ʌs̡t] 'ugly'

The same postvelar effects on vowels also occur in Lillooet: as in Th, uvulars, pharyngeals and retracted alveolars (z(̡), l(̡), s̡, ç) cause an adjacent vowel to lower and retract. In Li unretracted /i u ə a/ are phonetic [e o ə ɛ], retracted /ɨ ʉ ə̹ a̹/ are phonetic [ɛ ɔ ʌ a] (see van Eijk 1985):

(10) *Li Retraction before Q, R, and Ç*

a. /ƛ'iq/	[ƛ'ɛq]	'to arrive here'
b. /suq̊ʷəm/	[sɔ́q̊ʷam]	'to skin an animal'
c. /maqaʔ/	[máqɛʔ]	'snow'
d. /pəq/	[pʌq]	'white'
e. /liʕʷ/	[lɛʕʷ]	'to take apart, to tear down'
f. /sp̊aʕ'/	[sp̊aʕ']	'burned out area'[5]
g. /muzmit/	[mɔzmet]	'pitiful'

---

[4] It is unclear whether retracted l, s, and c are underlying in Li and Th. Our presentation of the data assumes that they are, following our analysis of Ċm retracted segments (see Bessell and Czaykowska-Higgins 1991). If they are not retracted underlyingly, the fact that retracted vowels in the examples in Li and Th have similar vowel qualities to those derived in Q/R environments suggests that some Tongue Root/Pharyngeal feature is involved in the production of the retracted vowels. Therefore one can postulate that retracted consonants and vowels do form a class with the pharyngeals and the uvulars.

[5] This form is actually [sp̊â::ʔ] on the surface, with the pharyngeal being heard throughout the vowel, which sounds long (see van Eijk 1985).

As in the case of CdA, laryngeals do not participate in the postvelar conditioning of vowel variants in either Th or Li. In (11a) and (12a) below there is no retraction of the vowels preceding laryngeals. In (11b) and (12b) laryngeals not only do not trigger retraction, but they can be transparent to retraction effects from consonants following the laryngeal.

(11) *Laryngeal Noneffects in Th*

a. No Retraction of Vowel

(i) /ni?helus/	[ni?hélus]	'good-natured'	*e˘, e˃
(ii) /qe?nimes/	[qɛ?nímes]	'hear s.t.'	*æ

b. Transparency

(i) /mice?q/	[mícæ?q]	'sit'	*ɛ/ɛ̂
(ii) /sna?z/	[snɑ?z]	'mountain goat hair blanket'	*æ/a

(12) *Laryngeal Noneffects in Li*

a. No Retraction of Vowel

(i) /p̂a?xʷ/	[p̂ɛ?xʷ]	'more'	*a
(ii) /spzu?/	[spzo?]	'wild animal'	*ɔ
(iii) /p̂i?/	[p̂e?]	'to squeeze out'	*ɛ

b. Transparency Effects

(i) /lí?iʕ'/	[lɛ́?ɛʕ']	' to scatter'	*ɐ,i,ɪ
(ii) /ci?iʕ'ʷ]	[cɛ́?ɛʕ'ʷ]	'to bleed'	*ɐ,i,ɪ
(iii) /ɬa?qs]	[ɬa?qs]	'to go ashore'	*ɛ
(iv) /ʔu?qʷa?/	[ʔɔ?qʷɛ?]	'to drink a little bit'	*u,ʊ,o
(v) /xʷʔa?z'aɬ/	[xʷʔɑ́?z'ɛɬ]	'good for nothing'	*ɛ

In both Li and Th, then, uvulars, pharyngeals and retracted alveolars lower and retract adjacent vowels; labials, alveolars, velars and also laryngeals do not have such effects on adjacent vowels.

2.3 Columbian

In Cm there is one Morpheme Structure Constraint which provides phonological evidence that postvelars function as a class. According to this constraint, given in (13), root morphemes which contain a pharyngeal segment in the position of the initial consonant cannot have a uvular, retracted alveolar, or pharyngeal in second-consonant position:[6]

[6] This MSC also prohibits velars from occuring in C2 position. Why velars are included in it is unclear. Perhaps there is a carry-over effect from uvulars to velars: uvulars and velars have a place specification in common in Cm and this may bring velars through the side-door, so to speak, into the space referred to in the MSC (see Bessell and Czaykowska-Higgins 1991).

(13) *Pharyngeal Morpheme Structure Constraint:*
In a root morpheme of the shape $\sqrt{C_1(V)C_2X}$, if C_1 is a pharyngeal segment, then C_2 cannot be uvular, pharyngeal, or retracted alveolar.

* R Q where R = Pharyngeal, Q = any uvular
* R Ç Ç = any retracted alveolar
* R R

Interestingly, neither of the two laryngeal consonants is included in the MSC in (13). Laryngeals can occur in C_2 position if C_1 is pharyngeal; thus both √R ʔ, and √R h roots are found in Cm. In fact, laryngeals never pattern with other postvelar consonants in Cm. Consider, for instance, the C_1-reduplication forms in (14) and (15). In C_1-reduplication of uvulars and pharyngeals the copied consonant may be followed by an optional epenthetic vowel or by a svarabakhti vowel (14); but if the copied consonant is laryngeal the vowel is obligatory and is never a svarabakhti vowel (15). For purposes of epenthesis, then, laryngeals do not pattern together with other postvelar consonants (optional epenthesis in C_1-reduplication actually occurs with all non-laryngeal consonants, and not just with postvelars, suggesting that laryngeals are different from all other consonants).

(14) *C_1-Reduplication of uvulars and pharyngeals*

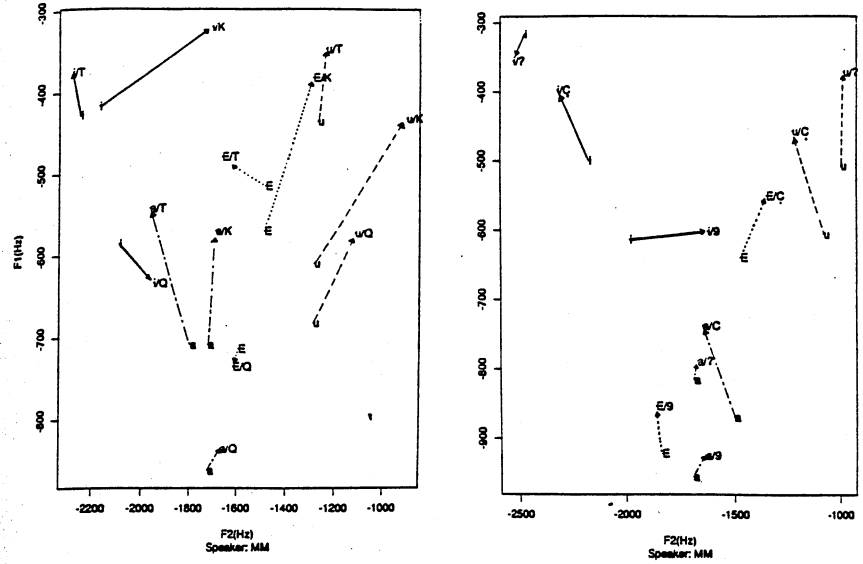
a. s-ʕ'ʷ-√ʕ'ʷə́s-ʕ'ʷəs	'pheasant chick'
b. k̓ɬ-ħ-√ħə́l' ~ k̓ɬ-ħə-√ħə́l'	'orphan'
c. χ̣-√χ̣əχ'-cín ~ χ̣ᵊ-√χ̣əχ'-cín	'dog'

(15) *C_1-Reduplication of laryngeals*

a. ʔə-√ʔíχ̣-úl'əxʷ-tn	'small garden rake'
b. hə-√hə́w'	'deerfly'
c. s-ʔə-√ʔiswəl-ált	'loon chick'

In the Li and Th data illustrated above, the effects that consonants have on adjacent vowels were recorded impressionistically. While the impressionistic data from Cm are similar to those from Th and Li, and provide additional evidence for the postvelar natural class, we have been able to conduct a phonetic study of Cm which confirms the impressionistic data through instrumental analysis. (16) and (17) summarize the results of our acoustic analysis of one speaker's vowel system. It is consistent with the analysis of three other Cm speakers, and so can be considered representative of the acoustic properties of Cm vowels.

(16) Cm Vowels /- alveolar, velar, uvular (17) Cm Vowels /- C, pharyngeal, laryngeal



In brief, our acoustic work confirms that, as in Li and Th, Cm vowels are subject to coarticulatory effects from consonants at every place of articulation except glottal. In (16) we have plotted the first and second formant values for two points of each vowel, namely, midpoint and offset. This plot shows the coarticulatory effects of alveolars, velars and uvulars on /i u a ə/. The plot can (loosely) be viewed as if it were a traditional vowel chart, with the high front vowel /i/ in the upper left corner, the high back vowel /u/ in the upper right corner, and so on. As the plots show, before alveolar consonants (symbolized by T) /i/ starts off high and front, and gets higher and fronter at offset—exactly the coarticulatory effects one might expect from a high front articulation (the formant values are connected with a solid black line). Before velars (K), /i/ is roughly in the same region at midpoint as before alveolars, but at offset it is markedly more back, as well as higher. Again, this is as one would expect from a high back consonantal articulation. Now, compare both of these effects on /i/ to /i/ before a uvular (Q). At midpoint this vowel is heavily coarticulated, being lower and more back than its alveolar and velar counterparts. At offset the vowel is even more low and back. The most striking effect before uvulars is that of lowering, and this is also the case for vowels occuring before pharyngeals and retracted alveolars. Consider, for example, the effects of pharyngeals and retracted alveolars on /i/ shown in (17) (the formant values are again connected with a solid black line). Note that before retracted

alveolars vowels are lower and more back at MIDPOINT than their plain alveolar counterparts. At offset alveolar place has considerable raising and fronting effects.

The acoustic analysis of Cm shows, then, that uvulars, pharyngeals and retracted alveolars are a phonetic class in Cm, functioning to condition lower and more back variants of vowels than occur in pre-uvular environments. Recall that in Th and Li, while uvulars, pharngeals and retracted alveolars form a natural class for purposes of lowering/backing vowel effects, laryngeals have no such effects on adjacent vowels, and in fact seem to be transparent to coarticulatory effects from following consonants. Our acoustic analysis of Cm shows the same lack of coarticulation and transparency effects in the case of Cm laryngeals. In (16), for instance, one can see that coarticulatory effects from glottals are minimal in Cm. Vowels followed by a glottal stop in Cm show one of two possible effects. First, as on the /i/ vowel, there may be minimal formant movement so that the vowel quality generally remains unaltered, and the vowel may simply be creaky. Second, it is sometimes the case that glottal stop is transparent to coarticulatory effects on the preceding vowel from the consonant following the glottal stop itself. This can be seen in the case of the /u/ vowel in (16): the tokens plotted in (16) are followed by an alveolar, which has the effect of raising the vowel somewhat at offset. The acoustic properties of the Cm laryngeals indicate that in Cm, as in the other Interior languages examined, laryngeals do not pattern with other postvelar consonants.

3. Evidence for Placeless Laryngeals

Both lack of coarticulation from the glottal and glottal transparency suggest that there is no vocal tract shaping required for the production of Cm laryngeals and that in this sense the laryngeals have no Place specifications. There are two arguments from Cm that laryngeals are phonologically as well as phonetically placeless.

The first argument is based on the observation that the effects of consonants on adjacent vowels which are illustrated in (16) and (17) involve spreading of the Place node rather than individual features. This observation can be demonstrated from the surface place specifications of the Cm epenthetic vowel. The underlying vowel inventory of Cm contains three vowels, given in (18). Each vowel's range is quite large and depends on the interaction between the underlying feature specification of the vowel and the consonantal environment in which that vowel appears. Even though each vowel varies, it does not intrude into the vowel space of the other two underlying vowels. In contrast, the epenthetic vowel's range is not only the largest, but its surface forms do overlap with the surface forms of the underlying vowels (see (19)). We interpret this as evidence that the epenthetic vowel is completely unspecified and takes its place of articulation entirely from its environment, and particularly from the following consonant.

(18) /i/ /u/ /a/

/i/→[i], [ɪ], [e], [e˅]

/u/→[u], [ʊ], [o], [o˅]

/a/→[ə], [æ], [a], [ɑ]

(19) V→ i / y, y' ɨ / alveolar

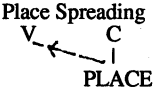
u / w, w', C^{w} u~ə$^{\wedge}$ / labial

ə / velar a$^{\check{}}$ / uvular

a$^{\check{}\check{}}$ / pharyngeal a / laryngeal

As (18) shows, the surface specification of the epenthetic vowel involves spreading of features associated with every consonantal place of articulation. If one assumes that this effect is a result of spreading of the Place Node as in (20) the effect can be accounted for by one rule; to assume that it is the result of the spreading of individual features would require the postulation of a number of different rules for what is clearly one process:

(20) Place Spreading



Given then, that the surface forms of the epenthetic vowel are derived by spreading of Place from adjacent consonants, the fact that laryngeals not only do not trigger coarticulation, but also can be transparent to coarticulation, indicates that laryngeals are not specified for a Place Node and thus are placeless. As placeless segments they have no Place Node to spread to adjacent vowels or to block spreading of Place, and thus are neither triggers nor blockers of (20).

Assuming that laryngeals are placeless, however, raises the question of how epenthetic vowels adjacent to laryngeals surface as central [a]. Clearly they cannot receive their surface specifications by (20). Notice that the surface form of the epenthetic vowel before laryngeals is higher than the vowel forms which surface in the environment of uvulars (a$^{\check{}}$) or pharyngeals (a$^{\check{}\check{}}$), and is also not of comparable quality to that found before pre-uvulars. The form of [a] can be accounted for if one assumes that it represents the un-coarticulated value for the default vowel of the system; [a] is derived from the epenthetic vowel only before laryngeals since *all* other consonants spread Place onto the epenthetic vowel's representation. There is no independent motivation in Cm for assuming that the vowel which appears in the environment of laryngeals is derived by default. However, comparing Cm with CdA provides some motivation for the assumption. Recall that CdA has two high front vowels in its underlying system /i_1/ and /i_2/, given in (21):

(21) *Coeur d'Alene Vowel System*

	i_1	i_2	e	u
high			-	
back		-		
round				+
retraction	a	e	a	o

One of these vowels alternates with [a] under retraction, whereas the other alternates with [e]. Both Doak (1989) and Bessell (1990) argue that /i_1/ is completely unspecified in UR and that it is the vowel which alternates with [a] under harmony processes. Now, CdA vowels vary in their surface forms depending on whether they are stressed or unstressed as well as on whether they are derived by harmony:

(22) *Unstressed Value of the Underlying Vowels:*

i_1--> [e, ə]	e--> [ə,$ə^w$]
i_2--> [e,ɪ,ə]	u--> [u]

Crucially, the surface form of the unstressed epenthetic vowel in the environment of laryngeals is unstressed [e], indicating that it is derived from one of the /i/-vowels. This vowel never surfaces as [a] in the environment of laryngeals, whether stressed or unstressed, although it does surface as [a] adjacent to other postvelars.

(23) *CdA epenthetic vowel quality*

/-in$\underline{ʔ}$/ 'on' [čə(t)-√yíl'x^w-ɪn$\underline{ə}$$\underline{ʔ}$-en-cut] 'cover self with blanket'

cf. Cm:

/-an$\underline{ʔ}$/ 'ear, on' [s-n-√ħc-án$\underline{ə}$$\underline{ʔ}$] 'earring'

Given, then, that before laryngeals an epenthetic vowel surfaces as an unstressed variant of [i] in CdA, and given that there are independently motivated default rules in CdA for deriving [i], the epenthetic vowel must get its surface form in the environment of laryngeals by the default rules. Since the epenthetic vowel in CdA does get its specifications by default, then this suggests that in identical laryngeal environments in Cm, an epenthetic vowel also gets its specifications by default. The difference between Cm and CdA is that the default values are different: in Cm the default rules derive [a] and not [i].

A second argument that laryngeals in Cm are placeless comes from an optional phonological process of glottalized glide decomposition. This process occurs widely in Interior Salish. In the Cm examples in (24) reduplication of a glottalized glide may result in a surface homorganic-vowel-plus-glottal-stop sequence. In (23a) C_2 of the root reduplicates into a C suffix which then receives an epenthetic vowel; thus in (23a.i), for instance, [w'] reduplicates and epenthesis occurs to derive [Vw']. The surface form of the reduplication, [u$\underline{ʔ}$], can be explained if one assumes that the glide spreads its Place features onto the unspecified vowel slot by Rule (20) above, and then delinking of Place occurs, thus leaving behind a placeless laryngeal segment which surfaces as glottal stop. If no delinking occurs, the reduplication simply surfaces as [uw'] (see 24b.ii where Vy' surfaces as [iy'] or as [i$\underline{ʔ}$]). In (24b) the reduplicated CəC prefixes also contain unspecified vowels which receive their Place specifications from the glottalized glides by (20), again leaving behind a glottal stop. Reduplicated affixes are underlined.

(24) *Glottalized-Glide Decompostion*

(a) C_2-Reduplication with epenthesis and spread from glide.

(i) k-√yə́w'-u̲ʔ	'it's unwinding off a reel'
(ii) s-√q'ʌy'-i̲ʔ-s	'it's brand'
(iii) ʔac-√xʷúy'-i̲ʔ-s-n	'I'm getting it ready'

(b) C_1C_2 prefix redupliction with epenthesis and spread from glide.

(i) nɪʔ-s-k̲ʷi̲ʔ-√kʷʌy'-ə́ʔst	'scab rock area south of Pateros'
(ii) c̲'u̲ʔ-√c'ə́w'-kst-m	'wash hands'

The fact that glottalized glides decompose into sequences which represent their Place specifications followed by their laryngeal specifications provides strong evidence that laryngeals are placeless in Cm. This is the type of evidence used in Clements (1985) and elsewhere to motivate a distinction between laryngeal and supralaryngeal features.

The properties of the Interior Salish laryngeals exemplified in §2, and in more detail for Cm in §3 are consistent with assumptions made in some of the earliest work on articulation-based theories: namely, that laryngeals do not have a Place component. As placeless segments they cannot participate in MSC's which make reference to place specifications; they function differently from all other consonants because they are the only placeless consonants; they have no coarticulatory effects on preceding vowels because they have no articulation to spread; and they can be derived from laryngeal specifications left behind by rules of Place spreading. Thus both the phonetic and the phonological behaviour of Interior Salish laryngeals indicates that they do not form a natural class with other postvelars or with any other consonants. We can conclude, then, that Interior Salish laryngeals have a representation such as that in (1b) above, in which there are only Laryngeal, and no Place, features and that they should not be represented as guttural laryngeals which have a Pharyngeal place component (2b) as suggested for Semitic by McCarthy (1991).

4. Conclusion

The evidence that we have examined from Interior Salish indicates that although Interior Salish languages have extensive postvelar inventories, there is no necessary relation between the presence of postvelars in an inventory and the guttural behaviour of laryngeal segments. Instead we have seen that in extensive postvelar inventories laryngeals may be Placeless and not Pharyngeal. This conclusion naturally raises the question of whether the apparent guttural patterning of Semitic and Nisgha laryngeals requires one to postulate that they do have a Pharyngeal component, or whether this patterning could perhaps be accounted for without assuming that these laryngeals are Pharyngeal. If laryngeals in some languages are indeed guttural, then one must assume that cross-linguistically there are two types of laryngeals.[7] However, if one could account for apparently guttural

[7] In such a case one could postulate, for instance, that there is a parameter which says that if a language has only an Oral node (i.e., lacks postvelars) then its laryngeals must be Placeless,

laryngeals without postulating that they have a Pharyngeal component, then one could maintain a hypothesis that laryngeals are universally Placeless. To this end we conclude this paper by briefly suggesting possible reanalyses of the Semitic and Nisgha arguments for guttural laryngeals.

Arguments for a guttural representation of Semitic laryngeals include five types of processes: 1) Transparency of all gutturals to vowel assimilation; 2) Prohibitions against syllable-final or geminate gutturals; 3) Vowel lowering in the environment of gutturals; i/a ablaut class conditioned by gutturals; 4) Mergers: ʁ→ʕ; χ→ħ; ħ→h; ʕ→ʔ; 5) Root MSCs which forbid adjacent gutturals. In Nisgha an unstressed [a] appears uniquely before uvulars and laryngeals; in addition, the glottal stop patterns with the velars and uvulars for purposes of a process of Spirantization, becoming a uvular fricative by this process (see Shaw 1991, Tarpent 1983).

The fact that Semitic pharyngeals are transparent to the spread of vowel features can be accomodated by assuming that all vowel features are under the Dorsal node, so that assimilation involves spreading to which any segment not under the Dorsal node will be transparent. If one further assumes McCarthy's (1991) separation of Oral (and its dependent Dorsal node) from Pharyngeal, pharyngeals will be transparent. A placeless laryngeal, lacking an Oral *or* a Pharyngeal node, will also be transparent. Crucially, laryngeals do not have to be represented by the Pharyngeal node to get this effect. The constraints on geminate and syllable final gutturals can also be handled by formulating a positive constraint requiring the presence of an Oral node, as McCarthy (1991) himself suggests for Tigre. Again, this will have the effect of treating laryngeals and pharyngeals as a class without having laryngeals structurally dependent upon pharyngeals. The guttural lowering effects in Semitic and Nisgha may be amenable to an analysis such as that implied here for Interior Salish: that is, pre-uvulars raise vowels, pharyngeals and uvulars lower them, and in the environment of laryngeals default rules provide place-of-articulation features. Such an analysis would predict that dialects may vary as to the value of the default vowel showing up in the environment of laryngeals, as we saw in Cm and CdA. In Ethiopian Semitic (Tigre) there is in fact a prohibition against low vowels in the environment of laryngeals (contrary to other Semitic languages where [a] occurs). Merger phenomena could be viewed as affecting segments outside the Oral class, and could be referred to as such. Root MSCs could likewise be accomodated with a positive constraint referring to the Oral node (*i.e.* adjacent consonants must be Oral). The Nisgha spirantization facts seem the most difficult to reanalyze: the fact that in Nisgha /ʔ/ often surfaces as [χ] in the same environments as /q/ might be due to an optional process of hardening of [h], rather than to the presence of a Pharyngeal node on the glottal.

Most of our suggested reanalyses make use of McCarthy's distinction between Oral and Pharyngeal place of articulation. Using this distinction allows one to group laryngeals with other postvelars by virtue of the fact that neither they nor the

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whereas if it has a Pharyngeal node, then its laryngeals may have the option, but only the option, of patterning with Pharyngeal segments.

true pharyngeals have an Oral place node. The grouping with uvulars would be by virtue of the fact that uvulars have primary Pharyngeal place of articulation, and to this extent are not Oral consonants. It does seem to be the case, however, that in order to maintain the hypothesis that laryngeals are universally placeless, one needs to assume a distinction similar to McCarthy's Oral/Pharyngeal distinction. Whether the suggested reanalyses would stand up to more careful consideration in the individual languages for which they are relevant is, of course, a subject for further investigation. Nevertheless the properties of Interior Salish laryngeals described in this paper suggest that such further investigation would be desirable.

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