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A Nonlinear Solution to Proto-Salish Retraction

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0. Introduction. In this paper I argue that a subset of Proto-Salish roots have associated with them a feature of retraction.[1] In most of the Interior Salishan languages, this feature has been retained and accompanies the root it is associated with in all of its manifestations, behaving in a manner akin to the stress assignment associated with roots and suffixes in Salish, or to tone association in a language such as Chinese. The retraction feature determines the shape of the root and the relation of the root to other morphemes within a word.

Two major problems in the study of Interior Salish phonology are solved by postulating a retraction feature underlyingly associated with certain morphemes. The status of *r* as a Proto-Salish phoneme has been defended by Kinkade and Thompson 1974, following Swadesh 1952. Kuipers 1981, however, argues that *r* is not necessary in the reconstruction of Proto-Salish, but is the development of a positional variant of *l. In this paper, I show that the reconstruction of retracted morphemes eliminates the problems presented by both models of Proto-Salish, with or without *r, and accounts for the distribution of *l* and *r* throughout the Interior.

The second related problem in Interior Salish phonology is accounting for the movement or spread of pharyngeal segments or features from root morphemes to stressed suffixes. Mattina 1979 presents full comparative data illustrating pharyngeal movement in Colville and stressed suffix vowel lowering in other Interior languages. The root morpheme retraction feature I propose here for a small set of Proto-Salish roots is manifested regularly and uniquely in each modern Interior language. Pharyngeal movement or spread can be easily accounted for in each language by some modification of a basic rule of progressive spread akin to the Coeur d'Alene Progressive Harmony rule necessary in the analysis of Coeur d'Alene vowel harmony (Doak ms.).

In the following sections, I will briefly present the different views on the development of Interior Salish *r*; the Retracted Root Hypothesis, including some basics of nonlinear phonology (feature geometry) supporting the proposal, and the mechanisms of each Interior language in maintaining root retraction; and the interaction of Root Retraction and Progressive Spread, including the unique behavior of Colville pharyngeal segments.

1. Interior Salish *r*. Coeur d'Alene, Colville-Okanagan, Columbian, and Spokan are the four Interior Salish languages that have *r*. In these languages, *r* appears only as C_2 of $C_1VC_2(C_3)$ roots where C_1 is not a postvelar (uvular). Cognates in the other Interior languages (Lillooet, Thompson, Kalispel, Shuswap) show *l* in this position. In Colville, Columbian, and Coeur d'Alene, *r* functions as a 'back' (uvular) consonant, and usually appears following a retracted vowel.[2] In Spokan, however, *r* does not

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[1]Support for this study was provided by the Melville and Elizabeth Jacobs Fund and the Phillips Fund. The following abbreviations will be used: Cm Columbian; Cr Coeur d'Alene; Cv Colville; Li Lillooet; Ok Okanagan; Sp Spokan; Sh Shuswap; Th Thompson.

[2]Interior Salish vowel systems are usually some modification of the four-vowel system including *i*, *a*, *u*, and *ə*. Retracted vowels are variants of these vowels produced with pharyngeal constriction or tongue root retraction. In Coeur d'Alene, *i* varies with *ɛ* and *a*, *u* varies with *ɔ*, and *ɛ* varies with *a*; Columbian has *ɐ*, *a* and *o* in contrast with *ə*, *i*, and *u* (Kinkade and Sloat 1972; Kinkade, p.c. 1987); in Colville, *a* appears to be the only retracted vowel; in Kalispel and Spokan, *a* and *o* function as full vowels as well as morphophonemic variants of *i*, *e*, and *u* (Speck 1980:22, 27); Thompson has retracted *i̝* and *ɐ* as well as *a* and *o* (Thompson and Thompson in press); Shuswap vowels *e*, *u*, and *i* have the 'darkened' forms *a*, *o*, and *e*, respectively (Kuipers 1974:31); Lillooet vowels *i*, *e*, *ə* and *u* each have a retracted counterpart *i̝*, *a*, *ɐ*, and *o* (inferred from van Eijk 1981).

function as a back consonant and appears following unretracted vowels. In Kalispel, a sister dialect to Spokan, and in Shuswap, cognate forms appear with *l* following a retracted vowel. Though *r* does not occur in roots following a uvular consonant, it may precede a uvular in roots such as Cr /trq 'kick, dance'.[3] Examples of *l* and *r* correspondences in the Interior languages are listed in 1:[4]

(1)	shake/spin	yellow	salt/sour
Cm	x^{w}ár	k^{w}ár	c'ár/c'ór
Cr	x^{w}ar	k^{w}ar	c'ɔr
Cv	x^{w}ar	k^{w}ár'/k^{w}r'i?	c'(a)r
Sp	x^{w}er(í)	k^{w}r(í)	c'ur
Ka	x^{w}al(í)	k^{w}al(í)	c'ol
Sh	x^{w}əlé	k^{w}él/k^{w}ál	c'al
Th	x^{w}ələ	k^{w}?ál'	c'ál
Li			c'ól

The *r* that appears in the Interior Salishan languages has been viewed either as the remnant of a Proto-Salish segment *r (Kinkade and Thompson 1974) which contrasts with *l, or as an innovation, derived from *l in particular environments (Kuipers 1981). Both views are briefly summarized here.

1.1. *r* as remnant. By reconstructing Proto-Salish *r, Kinkade and Thompson 1974 (following Swadesh 1952) can simply account for the distribution of *r* in the r-languages and its usual reflex, *l*, in the other Interior languages. For example, Kinkade and Thompson (1974:23) point out that in Thompson, *r > *l* only after *l > *y*. The *l* that appears in Thompson is a retracted or 'dark' *l* (Thompson and Thompson in press), reflecting a distinct characteristic of Salish *r*. In the other Interior languages without *r* (Lillooet, Shuswap, Kalispel), *r and *l have merged, appearing as *l*. Certain forms in Kalispel and Shuswap (and perhaps also Lillooet) show *l* following lowered vowels; these *l*s are presumed to be derived from *r, since their environment is similar to that of *r* in the r-languages.

By reconstructing the protophoneme *r, Kinkade and Thompson must assume that *r* occurred in other than C_2 position at some earlier stage in the development of the modern Salish languages. But there is limited evidence for *r* in other positions: the few cases that Kinkade and Thompson (1974:24-25) present to argue for *r in initial position or in suffixes show a correspondence of Th *l* to *l* elsewhere in the Interior languages, which may just as well be accounted for by borrowing or the phonetic influence of other segments within the morpheme.

1.2. *r* as innovation. Kuipers' (1981) arguments for *r* as an innovation in Interior Salish, rather than as a relic of Proto-Salish *r, are based on comparative observations on the position of *l* and *r* in Interior Salishan roots. Kuipers demonstrates that in the Salish languages, particularly the Interior languages, there is an opposition between plain vowels and retracted vowels (1981:331). This opposition is independent of any conditioning factors, and so Kuipers reconstructs an incomplete series of retracted

[3]Roots of this type may be analyzable as root plus suffix; several vowelless suffixes of this type (e.g. -k^{w}, -p) appear to modify the meaning of a number of Coeur d'Alene roots: /maɬ 'boil': /maɬ-p 'be uncomfortably warm'; /yar 'hooplike object rolls: /yark^{w} 'be curved'; x^{w}ɛt' 'move hurriedly'; /x^{w}ɛt'k^{w} 'rise suddenly'; /t'ap 'shoot': /t'apq 'stick pinlike object in'.

[4]Data are taken from Kinkade and Thompson 1974, confirmed where possible with data from recent dictionaries, including Carlson 1989, Kuipers 1974, and Mattina 1987.

vowels: *ạ, *ụ, and *ẹ. The limited distribution of *r* is accredited to its development from *l in positions following the reconstructed retracted vowels. Thus, presumably, the reconstructed root *k'ạl (1981:327) would develop a retracted *l* following the retracted vowel. This *l* would then shift to *r*, as in the Cv form /k'ar- 'to cut'.

Kuipers does not include Spokan forms in his discussion of *r* and *l*. The single Spokan form he does cite (1981:326) provides counterevidence to his assertion that *r* occurs only following retracted vowels: Sp wir'/ʔu·r 'to burn'. Carlson's (1989) recent dictionary provides many Spokan forms with *r*, all of which follow the unretracted vowels *i*, *e*, or *u*,[5] or a consonant. All Kalispel cognates provided by Carlson for the Sp r-forms include a retracted vowel and *l* (*al* or *ol*) to replace Sp *Vr*.

A second problem with Kuipers' analysis is that it requires the reconstruction of a much larger vowel system than is evident in any of the modern languages. Most Salishan languages have small vowel systems, usually with three or four vowels. Thompson (1979:697) points out that these vowels 'often exhibit wide variation', but that variation is generally predictable.[6]

2. Retracted Root Hypothesis. The analysis of *r* as a remnant fails to explain the limited distribution of the protophoneme *r. The analysis of *r* as innovation introduces three new Proto-Salish phonemes which are otherwise not justifiable, and fails to account for Spokan data.

The problems of both analyses may be eliminated by positing a retraction feature (perhaps similar to Kuipers' 'darkening' feature (1981:324)) that is associated with a small set of Proto-(Interior-)Salish roots. For the moment, I will consider this retraction feature the same as the Pharyngeal node on the feature hierarchy illustrated in Figure 1. This hierarchy is based on the work of Clements 1985, Sagey 1986, and Ladefoged and Halle 1988, and has been modified to account for Coeur d'Alene and other Salish data (Doak ms.). The hierarchy includes nonterminal (articulator) and terminal (feature) nodes. Pharyngeal is an articulator node that dominates the feature node [+/-retracted tongue root], just as Labial dominates [+/-round].

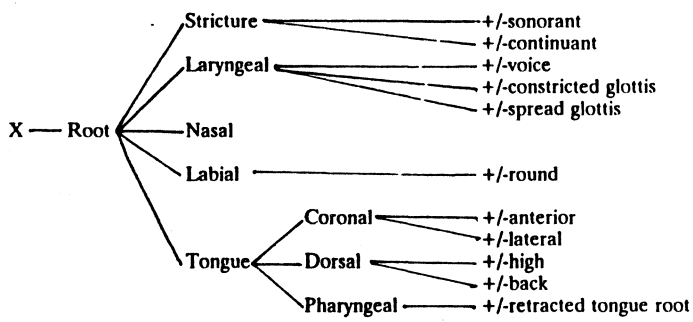


Figure 1. Salishan Feature Hierarchy

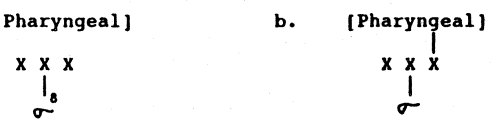
[5]If a uvular follows the *r*, a retracted vowel may appear: taraq 'to kick'. The only exception to this generalization is the form mari 'to heal', which may be borrowed.

[6]Refer to footnote 2.

Phonological segments (represented here with X following Levin 1985) may be specified in underlying representation with the presence (not absence)[7] of any nonterminal node or by the value [+ or -] of a terminal (feature) node, or be assigned node or feature specification by rule. Segments are specified only for those features or nodes specifically involved in their production; for example, if a segment does not include distinctive articulation with the tip or blade of the tongue, it will not be specified for the Coronal node or any of the features (anterior, lateral) dominated by that node.

The postulated Salish Retracted Roots are historically associated with the Pharyngeal node, though the node is not specifically associated with a particular root segment. Compare the following:

(2) a. [Pharyngeal] b. [Pharyngeal]



In 2a, the Pharyngeal node is underlyingly associated with a three-segment root. In roots of this type in the Interior languages, the Pharyngeal node will, at some point in the historical derivation of the word, be associated with one or more segments. In 2b, however, the Pharyngeal node is underlyingly associated with a specific segment. Depending on other features that may be associated with this segment and the function of the Pharyngeal node in the specific language, this segment will occur as ʕ, ʕʷ, ʕˀ or ʕʷˀ, or *l*, ɕ, ʂ, or *n*.[9]

Retracted roots, such as that shown in 2a, may be reconstructed for Proto-Salish, eliminating the need for reconstructed *r or *ạ, *ụ and *ə. Developments in the phonologies of the individual Interior languages account for the diverse forms these roots take in each language. Possible derivations for the modern forms in the Interior languages are presented in the following sections.

2.1. Coeur d'Alene and the *r* languages. In Coeur d'Alene there are retracted vowels as well as *l* and *r*. The attachment of the Pharyngeal node to a specific segment in the historically retracted roots is dependent on the specification of other segment features within the root. The tendency in Coeur d'Alene is for the Pharyngeal node to attach to the first least-specified sonorant segment (right to left) in roots without a uvular or pharyngeal C_1.[10] 'Least-specified' refers to those segments with the fewest nodes and features specified in underlying feature representation. This assumes that the unglottalized coronal sonorant *l* [Coronal, +sonorant] is the least-specified sonorant that occurs in C_2 in Coeur d'Alene. A possible minimal feature specification for the Coeur d'Alene sonorants and vowels, based on the proposed feature hierarchy (cf. Figure 1), is given in 3; glottalized segments are omitted.[11] The vowels and *l* are minimally specified with only two nodes/features. Though ʕ is also minimally specified

[7]The presence of a nonterminal node will be indicated here with Node or [Node].

[8]Sigma (σ) refers to a syllable nucleus.

[9]And possibly *r*. Refer to discussion of Cr /kʷar 'yellow', section x.x.

[10]The restriction on Pharyngeal attachment to roots containing uvular or pharyngeal segments is likely the result of some manifestation of the Obligatory Contour Principle (see McCarthy 1986).

[11]Minimal feature specification depends on redundancy rules of the form [+son] → [+vc] or [+son] → [Stricture], and feature filling rules of the form ∅ → [+back] to complete segment node and feature specification. Feature and node abbreviations used here include the following: *Str* Stricture, *son* sonorant, *cont* continuant; *Lar* Laryngeal, *vc* voice, *cg* constricted glottis, *spr* spread glottis; *Nas* Nasal; *Lab* Labial, *rd* round; *Cor* Coronal; *Dor* Dorsal, *hi* high, *bk* back; *Phar* Pharyngeal.

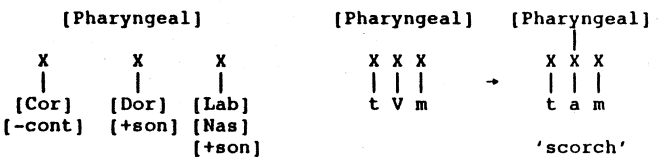
for only two nodes/features, it is already specified for the Pharyngeal node and therefore not subject to Pharyngeal attachment.

(3) Minimal Feature Specification for Coeur d'Alene Sonorants

	ʕ	ʕʷ	m	n	y	w	ʔ	h	l	i_1	i_2	ɛ	u
Str													
son	+	+	+	+	+	+	+	+	+	+	+	+	+
Lar													
vc							−	−					
cg							+						
spr								+					
Nas			+	+									
Lab		+	+			+							
rd													+
Cor				+	+				+				
Dor						+				+			
hi												−	
bk					−						−		
Phar	+	+											

Example 4 shows the Pharyngeal node of the retracting root attaching to the rightmost least-specified sonorant. In this case, the segment is minimally specified as [Dorsal, +sonorant].[12]

(4)



In Coeur d'Alene, all Pharyngeal segments are assigned the Dorsal features [-high +back] by the rules given in 5 (Doak, ms.).[13] This causes the 'darkened' or 'lowered' form of the vowel to appear in underlyingly retracted roots where Pharyngeal attaches to the vowel.

[12]The distribution of Coeur d'Alene vowels would allow a segment underlyingly specified either as *i* [Dorsal +sonorant] or *ɛ* [+sonorant -high] to occur in this root. The form suggested here is arbitrary.

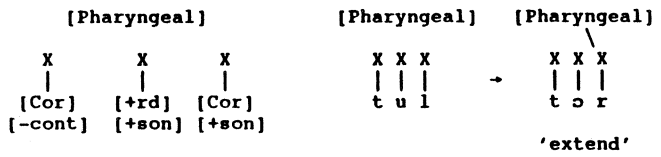
[13]These rules indicate that (i) all Pharyngeal segments are assigned Dorsal features, and (ii) all segments specified for dual articulation under the Tongue Position node (i.e. Coronal Dorsal or Dorsal Pharyngeal segments) must be specified for the Dorsal features [-high +back]. Once these rules apply, the Pharyngeal specification of Coronal Dorsal (*r*) segments is superfluous and may be delinked.

(5) a. [Pharyngeal] → [Dorsal]

b. $\begin{Bmatrix}\text{[Pharyngeal]}\\ \text{[Coronal]}\end{Bmatrix} \rightarrow \text{[-high +back]} \;/\; \left[\; \overline{\text{[Dorsal]}} \;\right]$

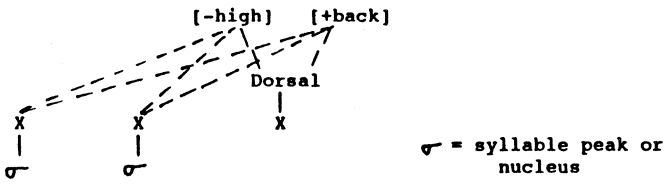
In example 6, the Pharyngeal node again attaches to the rightmost least-specified sonorant segment, which in this case is the coronal sonorant that would otherwise appear as *l*:[14]

(6)

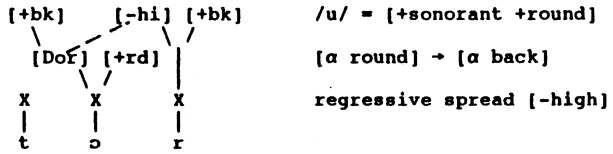


The Dorsal features [-high +back] again are assigned to the Pharyngeal segment by rules 5a-b. The assignment of the lateral feature expected with a nonnasal coronal sonorant is restricted, and the segment occurs as *r* rather than *l*. The retracted vowel that appears in this root is the result of a regular rule of regressive harmony in Coeur d'Alene: uvular segments spread the features [-high +back] to all preceding vowels. This rule is presented in example 7 (Doak, ms). The rule is applied to /tɔr 'extend' in example 8.

(7) Coeur d'Alene Regressive Harmony



(8)



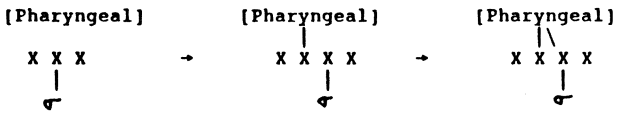
[14]There appears to be evidence that *l* may function as the default consonant in at least two Native American languages, Alabama and Coeur d'Alene (Montler and Doak, in preparation). Any comments are welcome.

In Coeur d'Alene, the Pharyngeal node associated with the underlyingly retracted roots attaches to the rightmost least-specified sonorant. Regular redundancy and harmony rules apply to create the retracted vowels and *r*s that appear in this set of roots. In the other Interior languages similar processes apply.

2.1.1. Colville. In Colville, the Pharyngeal node of retracted roots may also be analyzed as associating with rightmost sonorants to create *r*. We can assume underlying specification and phonological rules are similar to those described for Coeur d'Alene. However, in Colville, there is no regressive harmony rule such as that given in 7,[15] and *r* does not lower a preceding vowel. Colville r-roots have may have stressed *i*, *u*, or *a* preceding *r*; otherwise the stressed vowel appears after *r*. Examples include /mur 'smooth'; /p'ir 'limber'; /x̣ar 'shake, shiver'; and /tra-p 'be unraveled'. Thus it is clear that the distribution of *a* in Colville is not limited to retracted environments as it is in Coeur d'Alene.

There are two restrictions in the attachment of Pharyngeal in Colville. The first is that where Pharyngeal would attach to a vowel (or syllable peak), there appears instead the sequence *ra*. This suggests that there is some phonetic condition on the cooccurrence of the Pharyngeal node and syllable nuclei. Colville instead allows the insertion of an additional segment and a rule of progressive spread from a pharyngeal consonant to an adjacent vowel:

(9) Colville X-insertion, pharyngeal attachment, and spread



Second, where Pharyngeal would attach to a round vowel (*u*) in a root, the round vowel remains unaltered. This will be addressed in the discussion of pharyngeal movement (section 3).

2.1.2. Columbian. The little data available on Columbian suggest an analysis of retraction and the occurrence of *r* similar to those presented here for Coeur d'Alene and Colville. Columbian, however, makes distinction between *r* and *l*, the latter being part of a set of retracted coronals including ç, ʂ, and *ɳ*. Columbian also includes in its inventory retracted *ʔ* and *a* as well as an occasional ɔ. Kinkade (p.c. 1987) states 'it isn't clear that retracted vowels in Columbian occur before retracted consonants (or *r* ...), but they do cause retraction of *c*, *s*, *l*, and *n*'. These observations suggest that in Columbian, historically retracted roots developed with *r* in C_2, or with retracted vowels; later, retracted segments were reintroduced in some manner, perhaps along with a rule of progressive spread, creating the retracted coronals *l*, ç, ʂ, and *ɳ*.

2.1.3. Spokan. The Spokan data presented in Carlson's (1989) dictionary all point to an analysis similar to that for Coeur d'Alene, but somewhat simpler. In Spokan, the Pharyngeal node associated with the historically retracted roots attached either to the rightmost sonorant or to the vowel. In the cases where Pharyngeal attached to the consonantal sonorant segment, *r* was created. This segment has no regressive influence on preceding vowels; thus the language includes roots such as /wir 'to burn',

[15]The Colville uvular and pharyngeal resonants may all occur following high vowels: liy̓ʷ-ɬt 'put something on for somebody or of somebody's'; múq̓ʷ-qʷ 'coward, chicken out, back down'; piɣ 'hunt' (data from Mattina 1987).

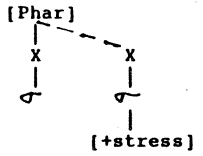
/c̓ur 'salty, sour', and /šer 'bent around' (Carlson 1989). Where the Pharyngeal node attached to syllable nuclei, retracted vowels occur: /p'aċ' 'loose bowels', /nos 'snot' (Mattina 1979).

2.2. The l-languages. In Kalispel, Shuswap, Thompson, and Lillooet, the Pharyngeal node in the historically retracted roots appears to have attached only to syllabic nuclei. The few forms given in example 1 are sufficient to indicate the correlation between the r- and l-languages, though there are some points that deserve further discussion. For example, in Thompson all *l*s have been described as retracted (Thompson and Thompson 1986). This indicates that in this language Pharyngeal may have attached to the rightmost sonorant, but the feature [lateral] was maintained or provided by rule despite the pharyngeal specification. If this is the case, then Thompson may also have a rule of regressive spread that lowers vowels preceding *l*; or Pharyngeal may have attached to both vowel and consonant. The limited data available for Lillooet suggest a similar development.

3. Pharyngeal movement. A consequence of the Retracted Root hypothesis is that it provides a neat analysis of pharyngeal movement and progressive spread in the Interior languages. Mattina (1979) presents comparative data on pharyngeal movement in Colville and suffix vowel lowering in other Interior Salish languages. Mattina's data show that in most of the Interior languages (Columbian and Lillooet are not presented) there is a tendency to transfer 'a pharyngeal element' from the root to the suffix. This transfer differs in the individual languages, which Mattina classifies into two types: pharyngeal movement with vowel assimilation; and simple vowel assimilation (1979:24).

3.1. Progressive harmony. The simple vowel assimilation described by Mattina 1979 has been analyzed in Coeur d'Alene (Doak, ms.) as rule of progressive harmony spreading the Pharyngeal node associated with a root vowel to a following stressed vowel:

(10) Coeur d'Alene Progressive Harmony



(11) a. /p'at' 'pour mushy stuff'
t/p'at'-i?s(t)-nt-s → tp'at'á?snts 'he poured cement on rock'

b. /t'am' 'lick, dampen'
/t'am'+t'am'-yuyc? → t'm't'm'yóyc? 'snail, leech'
/t'am-ilg^{w}cs-cin-m → t'amclg^{w}scénm 'he licked his lips'

It is clear that other processes such as root vowel loss are involved in the derivation of the forms in 11, and must be considered in a full analysis of the language. But the process of harmony itself is simple and the rule formulated for Coeur d'Alene seems applicable to the Spokan, Kalispel, and Shuswap data provided by Mattina 1979. It is possible that a similar process was or is active in Thompson and Lillooet.

A comparison of forms for 'oyster, clam' in Coeur d'Alene, Colville, Spokan, and Kalispel shows that in the r-languages (Cr Cv Sp) the attachment of Pharyngeal to the root-final sonorant allows regressive harmony (Cr) but prevents progressive harmony. In Kalispel only is progressive harmony

observed, since in this language Pharyngeal attaches to the root vowel, leaving the final sonorant unmarked for Pharyngeal and thus unable to block progressive spread:

(12) *[Phar]
/k^{w}Vl 'oyster, clam'

Cr	sk^{w}a?rínc?	=inc? 'ear, surface'
Cv	sk^{w}ək^{w}rína?	=ina? 'ear'
Sp	sk^{w}k^{w}əréne?	=éne? 'ear, surface'
Ka	sk^{w}k^{w}əláne	=éne? 'ear'

3.2. Colville Pharyngeal movement. Colville behaves uniquely among the Interior languages. As was observed in section 2.1.1., the attachment of Pharyngeal in Colville requires the insertion of an extra segment slot if no consonantal sonorant is available. A process similar to Coeur d'Alene progressive harmony in Colville involves pharyngeal movement as well as spread:

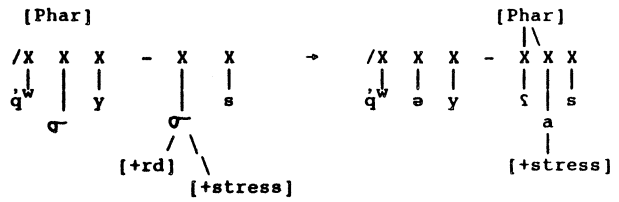
(13) a. q^{w}ʕáy 'black'

b. i-s-t-/q^{w}ʕay-íc̓a? → istq^{w}əyʕác̓a? 'I am very dirty'

c. /q^{w}ʕay-ús → q^{w}əyʕás 'black man'

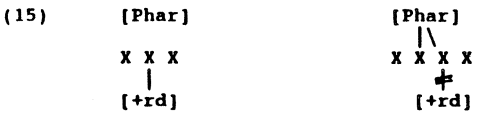
This suggests that in Colville Pharyngeal attachment occurs following word formation and stress placement, whereas in the other Interior languages Pharyngeal attaches to the root prior to affixation. Thus in Colville pharyngeal movement is not really movement at all, but insertion of a segment immediately preceding a stressed vowel, association of the floating root [Pharyngeal] to that segment, and spread of [Pharyngeal] to the stressed vowel. The form shown in 13c would be derived as in 14:

(14)



A round retracted vowel (*o*) is rare in Colville roots (other than in borrowings), which suggests that (a) the sequence ʕ*a* replaces a [+round] vowel in some roots and in suffixes through X-insertion, progressive spread and delinking of [+round], as shown in 14 above and in 15:

(15)



or (b) that Pharyngeal simply does not attach to roots with [+round] vowels. Two cognate sets presented by Mattina (1979:19 examples 18 and 19) show Spokan and Kalispel roots with retracted round vowels corresponding to Colville roots with unrounded vowels, one of which is retracted:

(16)	a.	Sp	c'ǫm	'bone'
		Ka	sc'om'	
		Cv	sc'im	
	b.	Sp	nǫs	'snot'
		Ka	nós	
		Cv	s-nʕas	

The forms in 16b suggest [+round] delinking with progressive spread of Pharyngeal in Colville. The behavior of at least one root in Colville, however, suggests the second solution. This root occurs stressed with *u*, but shows evidence of being a Retracted Root in that when it occurs with a stressed suffix, that suffix shows pharyngeal intrusion and assimilation:

(17)	Cv	/c'um'	'suck'
	a.	c'əm'c'úm's	'he sucked on them'
	b.	c'əm'c'm'ənʕás	'he started sucking'
(18)	Cr	/c'ɔm'	'suck'
		ni? c'ɔm'áwesənts	'he sucked among'

The cognate root in Coeur d'Alene (18) retains the unstressed retracted vowel after progressive harmony applies.

4. Summary. The Retracted Root hypothesis presented here accounts for the distribution of *r* and retracted vowels in all the Interior Salishan languages without the need for a set of reconstructed retracted vowels or reconstructed *r. Instead, Proto-(Interior-)Salish roots reconstructed with a floating Pharyngeal node provide all the necessary specifications to allow for the variety of forms found in the Interior languages through simple rules of attachment and regressive spread. The reconstructed retracted roots also allow for succinct analysis of pharyngeal movement and progressive harmony in the Interior.

But problems do remain with the analysis. Several Coeur d'Alene roots show retracted vowels preceding *l*, where one would expect *r* (/maʕ 'bubble' or 'heat'; /maʕl 'dirt, earth'). Also, several roots identified as the source of progressive pharyngeal harmony show *l* or *r* in C_2, neither of which is expected: Coeur d'Alene roots /maʕl 'earth' and /ɬɛʕl 'sprinkle' both cause progressive harmony. One

would expect *Vr* rather than a pharyngeal-spreading vowel followed by *l* in these roots if the Retracted Root hypothesis were correct. Evidence of late borrowing may account for these and similar unusual roots in the other languages. Also, the Coeur d'Alene root /kʷaʕr 'yellow' has both *r* and a pharyngeal-spreading vowel. The cooccurrence of adjacent segments with like feature/node specification should be prevented by the Obligatory Contour Principle. A reevaluation of the Coeur d'Alene root specification, rules of Pharyngeal attachment, and vowel features, including [+retracted tongue root] specification, may aid in future analyses.

Further studies of Salish retraction will require more complete analyses of the Interior languages including assessment of the minimal feature specifications necessary in each to account for spread and blocking of spread; information on ablaut and borrowing; and possible retracted root correspondences in Coast Salish and the less-studied Interior languages.

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