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The details of the PS \( *y > Th \) change will explain the limited distribution of PS \( *r \) in \( C_2 \) position and how the reflexes of PS \( *y \) may have developed. The modern reflexes of PS \( *y \) in \( Th \) and Li dialects are shown below, followed by the reflexes of proposed PS \( *r > r, l \).

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**PROTO-SALISH \(*r* REVISITED**

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<table>
<thead>
<tr>
<th>PS ( *y )</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_2'/C_1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th z</td>
<td>( z' )</td>
<td>( z' )</td>
<td></td>
</tr>
<tr>
<td>Li z</td>
<td>( y )</td>
<td>( y )</td>
<td></td>
</tr>
</tbody>
</table>

The full implication of those reflexes and additional phonetic detail are presented below. \(^4 \) Importantly, PS \( *y \) does not become Li \( z \) if PS \( *y \) precedes a coronal (it remains \( y \)); PS \( *y \) otherwise becomes Li \( C_1 z \) and \( C_2 l \) in one Li dialect. Those distributions alone indicate that a Salish protoegend can develop differently in \( C_1 \) position vis-à-vis \( C_2 \) position. Further parallels between the PS \( *y \) and \( *r \) changes will unfold below.

2. Thompson and Lillooet \( z \). The phonetic details and phonological behavior of the reflexes of PS \( *y \) in \( Th \) Li are relevant to the PS \( *r \) issue. PS \( *y \) developed into \( Th \) z, \( Li \) z, \( l \). PS \( *y > Th \) z in all positions; e.g., Th \( *z' \) 'bulky, big around,' Ka \( *z' \) 'aunt,' Ka \( *z'' \) 'man's mother.' PS \( *y > Li \) z in PS \( *r \) \( > \) \( Li \) z, \( l \) in \( C_2 \) when not followed by a coronal consonant; PS \( *y > Li \) \( y \) in \( C_2 \) when followed by a coronal consonant. \(^3 \) Compare these Li and \( Th \) forms, showing a cognate root and suffix: Li \( qa'y-la' [l] 'jump'; cf. Th \( q'o'z-la' [l] 'jump' (PS \( *l > Th \) \( y \)). A few Th forms sporadically show PS \( *y > Th \) \( y \) before a coronal; e.g., Th \( *s'o'z-la' 'play, but Th \( s'e'z'-e'kla-m' 'play with things' (Li \( s'o'z'-s'e' 'play, Sh \( s'de'se 'play (of children), \( s'k'e'kn 'toy'); Th \( m'e't 'shaman cures' (Li \( m'e't [e] id.); Th \( q'o'z 'reach top' (Li \( q'o'z [e] summit'); Th \( *s'y-n = s'y-n 'net' (Ka \( *s'y-n [e] id.; Sh \( *s'y-n [e] id.), Th \( cw'-a'z-m 'make net,' \( T'o'c'-a'z 'check net,' \( T'ac'-p'-a'z 'catch fish in stationary net.'

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especially so before another consonant or when laryngealized. Th z generally has a lesser sibilant quality than English z, especially in C1 position or when laryngealized.1 We summarize the relative phonetic shape of Th z as C1 and C2: C1 - [z], C2 / V - # - [z']. C2 / V - C1 - {z'}. laryngealized z' - {z'}.8

Th z may approach an interdental articulation and can sound like 3.9 Egedalsal has not heard such a pronunciation, however, at Lytton (Upper Th dialect). Th z differs from English 3 as it relates to the width of the channel (and consequently the velocity of air flow and high frequency). English 3 is articulated with a flatter tongue, allowing a wider channel; 3 accordingly is less sonorous than Th z. Th z is articulated with a narrower channel, is more sonorous, and has a more definite sibilant effect (especially in C1 position). We would expect acoustic studies to show comparatively larger energy at high frequencies for Th z (especially in C1 position) than for English 3. In C1 position especially, Th z has a definite sibilant effect.

Finally, Th z involves some retroflexion, with some bowing of the tongue, which gives Th z an r-like quality (cf. Thompson and Thompson 1992:8). Laurence C. Thompson, in fact, in his first fieldwork on Thompson in the 1960s transcribed Th z as r', reflecting the r-coloring of retroflexion. That perception of Th z as r-like further indicates the relevance of PS *y > Th z to the issue of PS *y > r, l. Th z can have l- or r-like qualities, and Li z can have an l-like quality and is l in one Li dialect (discussed immediately below). Importantly, Th z exhibits velarization and varying degrees of laterality (depending on syllable position or laryngealization), shows some retroflexion, and retracts preceding vowels. We will argue that PS *y had similar qualities.

2.2. Lillooet Li z. Li z is phonetically similar to Th z. van Eijk (1985:4) describes Li z:

Phonetically, z' are lax fricatives, varying from a purely dental articulation (with the tongue-tip more forward than in English "z") to an interdental articulation (where z' sound somewhat like lax English "th"); the former pronunciation is generally more common in the Fountain dialect (F), the latter in the Mount Currie dialect (M); in phonetic transcriptions we use [z' z] for both F and M variants; after vowels z' in M allows the variant [l] besides [l'], e.g., [kaz' lalp] "ember(s)" . . . . 10

van Eijk (1985:15 n. 1) adds:

The interdental articulation is also somewhat more lax than the dental one (i.e., in the interdental articulation the tongue-tip is allowed to drop from a position behind the upper teeth to a position closer to the edge of the upper teeth); occasionally, z' is pronounced [l] in the position C-, or z is pronounced [l] (after or before vowels); the phonemes l l' do not allow the variants [z z'], e.g. palp 'lost'; polp', never *[pazp].

van Eijk (p.c.) further explains concerning Li z:

Lillooet /z' z'/ are very lax dental/interdental spirants, their laxness being particularly noticeable in postvocalic position, where l' /z'/ sound like [l l'], especially in the Mount Currie dialect where [l l'] are actually the preferred pronunciation.

In the Li Mount Currie dialect, then, PS C2 *y > z > l /C1_consonal or /l suk. That change shows how a central approximant in C2 position can become velarized with an accompanying lateral effect and ultimately be reinterpreted (or misinterpreted) as a lateral approximant.11

2.3. Th, Li z and vowel retraction. Th z and Li z retract preceding vowels similarly. van Eijk (p.c.) explains concerning Li z:

Neutralization of vowels takes place before /z' z'/. In both the Fountain (F) and Mount Currie (M) dialects, /i - y/ and /a - o/ are neutralized and only /i/ and /o/ occur here. /u - w/ are also neutralized here, with /u/ occurring only in F, /u/ only in M . . . . /a - o/ is neutralized before /z' z'/ in M, where only the variants of /a/ are heard, but not in F.

That vowel neutralization combined with varying dialectal reflexes for postvocalic PS *y can lead to rather different pronunciations: /k'la'z' 'canoe' is [k'la'z'] in the Fountain dialect, but [k'la'] in the Mount Currie dialect (van Eijk, p.c.). Those Li data raise some very interesting parallels with the reflexes of PS *y and preceding vowels. Consider these correspondences within the Spokane-Kalispel dialect continuum relative to the development of PS *y in Li (Mount Currie dialect): Sp er, Ka al < PS *ur; Li (F) ez', Li (M) al' < PS *ay'.

Neutralization of vowels also takes place before Th z'. In all dialects, /i - y/ and /a - o/ are neutralized; only /i/ and /o/ occur. /u - o/ also are neutralized, as /u/ /o/. /a - e/ are neutralized, as /a/ /e/.

Put another way, /u > /a and /e > /a/ before Th z z'. Th e also may alternate with z /z/ before z z'; e.g., zesk - zesk 'revenge'; cf. Fl zesk id. Th a alternates with a in a pair of roots with slightly different meanings: تست 'it sticks out gradually,' and تست 'it's crooked, protrudes, sticks out a little (beyond main point of something).' The difference may reflect sound symbolism of retracted versus unretracted vowels, as discussed by van Eijk (1983:286) and Kuipers (1981:332).13

What is of paramount importance here is that Th, Li z retracts preceding vowels, not vice versa. Th Li z derives from a proto-consonant (PS *y) that clearly did not retract preceding vowels. The sequence was: PS *y retracts to Th, Li z, which then retracts preceding vowels. The same sequence has occurred in British English, where postvocalic l is velarized, and such l then velarizes the preceding vowel (Ladefoged 1993:96). That attested sequence argues against Kuipers's position that a 'darkening feature' or darkened retracted PS *y (> y > r).
We connect retraction and retroflexion of the tongue with the lateral effect of \( \text{Th} \) \( z \). Consider the description in Heffner (1969:144) of lateral \( r \) and \( z \) in Bantu languages:

The sounds usually classed as lateral consonants are the various "L" sounds, but it must be observed that other lateral sounds occur. There are lateral \( [s] \) and \( [z] \) sounds, for example in the Bantu languages. [Note omitted.]

These Bantu sounds are strongly retroflex articulations which force the breath to flow over the lateral margins of the tongue.

The retroflex articulation of Th \( z \) similarly forces the breath to flow over the lateral margins of the tongue, giving Th \( z \) a lateral effect (in postsyllabic position). When Th \( z \) is laryngealized as \( z' \), that secondary articulation also increases the lateral effect. The motivation is unclear. Perhaps greater retraction of the tongue or pharyngeal constriction exaggerates retroflexion, which, in turn, causes greater laterality of Th \( z' \). Th \( z' \) \([t']\), perceptually if not actually, is very difficult to distinguish from Th \( l' \) \([t']\). We learned to distinguish Th \( z' \) from \( l' \) by listening for some sibilance \([\ell']\) for \( z' \); albeit greatly reduced relative to Th \( z \).

That description would be consistent with the Li dialectal doublet for 'canoe,' Fountain \( a\'l\'az' \), Mount Currie \( a\'l\'il' \), where the more retracted phoneme is the lateral \( l' \) (which retracts the preceding vowel), while the less retracted phoneme is the spirant \( z' \) (which does not retract the preceding vowel). It may be difficult to maintain the laryngealization and a narrow channel for spirantization. Th \( Cz > [z] \) - \([t']\) and Li \( Cz > [\ell] \) (especially Mount Currie dialect) represents a move away from a central approximant toward a lateral approximant (as would PS \( Cz r > Th l' \)). Th \( l' \) and Li \( l' \), however, are never confused with \( z' \), respectively; that will be important regarding a \( Cm \) doublet and Ok (Methow) doublet showing \( r' \) varying with \( l' \) below.

3. PS \( Y > Th \), Li \( z \). The sequence for PS \( Y > Th \), Li \( z \) can be outlined as follows:

<table>
<thead>
<tr>
<th>Change</th>
<th>Position</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PS ( Y &gt; z )</td>
<td>( C_4 )</td>
<td>Th, Li</td>
</tr>
<tr>
<td>2. PS ( Y &gt; z )</td>
<td>( C_2 )</td>
<td>Th; Li ( z ) varies with ( y ), except before coronals, where PS ( Y &gt; y ) ([5])</td>
</tr>
<tr>
<td>3. PS ( Y &gt; V_{[en]} )</td>
<td>( /_z )</td>
<td>Th, Li</td>
</tr>
<tr>
<td>4. ( z ) loses retraction</td>
<td>( C_1 )</td>
<td>[z]</td>
</tr>
<tr>
<td>5. ( z ) loses retraction</td>
<td>( C_1 )</td>
<td>Th (in progress); Li (in progress?)</td>
</tr>
<tr>
<td>6. PS ( Y &gt; V_{[en]} )</td>
<td>( /_z [z] )</td>
<td>Th (in progress); Li (in progress?)</td>
</tr>
</tbody>
</table>

Th appears further along in the PS \( Y > z \) change than Li, at least as it relates to \( z \) generalizing to both \( C_4 \) and \( C_2 \) positions. PS \( Y > z \) perhaps was a change that originated in Th and spread to Li. Th otherwise has been more innovative in terms of phonological change than Li e.g., PS \( Y > Th y \) (which had to occur after PS \( Y > Th z \)), whereas PS \( Y > Li l' \). We addressed the first three stages of PS \( Y > Th \), Li \( z \) above. We now discuss the last three stages.

3.1. \( z \) loses retraction (C4). Th \( z \) in \( C_4 \) position has lost velarization. Such loss is confirmed by \( z \) no longer retracting preceding vowels in reduplication forms. Th forms a diminutive by reduplicating (symbolized with raised dot ·) the consonant preceding the word's stressed vowel and infixing it (symbolized by square brackets [ ] ) after that stressed vowel: \( C_4 V C_4 > C_4 V (C_1) C_2 \). If the reduplicated, infixed consonant is a resonant (such as \( z \)), it becomes secondarily laryngealized: \( z > z' \). There are several examples of a \( C_1 z \) becoming infix as \( z' \) in diminutives; the vowel preceding that infixed \( z' \) does not retract. E.g., Th \( szel\' 'plate,' széc \( l' \) 'little plate'; \( \text{zasi} \) 'menstruate,' \( \text{zasi}l'i \) id. (less formal); \( \text{zasi}x'\) 'say goodbye to someone,' \( \text{zasi}x'\) esc id. (affectionate). The retracted vowels otherwise would be \([a] \) for \( e \) and \([e] \) for \( u \).

There is one example where infixed Th \( [z'] \) still retracts: \( \text{szizazi}z'\text{im} ' \) (from \( s\text{zay}-\text{zaz} '-\text{zy}-\text{tan} \) plus secondary laryngealization of resonants; \( [\sigma] \) syllabifies as \( i \) 'little things people do'; compare \( \text{szizy}n\) (from \( s\text{zy}-\text{zy}-\text{tan} \) 'things people do.' The form \( \text{szizazi}z'\text{im} \) suggests that \( C_4 z \) has not lost fully its retraction. It alternatively might reflect a lag from the change in the consonant to a change in the neighboring vowel. Compare the effect that Russian \( j \) and \( f \), velarized consonants, have on following \( o \). In Russian, \( o > i \) after palatalized consonants; \( o > a \) after velarized consonants. After \( j \) and \( f \), however, \( o > i \). \( j \) and \( f \) still act like the palatalized consonants they once were (Ward 1965:31). Th \( C_1 z \) (infixed as \( z' \)) may be acting similarly in Th \( szizazi'z'im \), reflecting an earlier shape of \( C_1 z \).

3.2. \( z \) loses retraction (C4). The following examples show that Th \( z \) is losing velarization, and consequently its retractive effect on preceding vowels. Th \( skz'az'\) 'a lie'; \( skz'ez'z' \) 'child,' \( skz'ez'\text{e} \) 'a lie'; \( q'\text{tz} 'z' \) 'turn (black and) blue,' \( \text{zsn} ' \) 'big,' \( \text{szl}z 'm 'a \) little bigger,' \( \text{spiz} ' \) 'animal,' \( \text{spiz} 'l ' \) 'bird.' The forms with retracted vowels show \([a]\); those with unretracted vowels show \([\sigma]\). Many if not most examples still show a retracted vowel before \( z \), but there are several examples showing \( e \) - \( a \) or \( y \) - \( a \) and \( u \) - \( o \) \([5]\). An example with the plural infix \([z\text{e}] \) is perhaps of special interest in showing Th \( z \) has not lost its retractive effect completely in \( C_4 \) position; e.g., \( \text{sc'ezx} ' \) 'male's in-law,' \( \text{sc'ezx} ' \) 'id. (plural). Actually, the plural infix \([z\text{e}] \) is not \( C_4 \), or \( C_2 \) of a root; as an infix it may act conservatively.

3.3. Vowels are not being retracted before \( z \). The preceding two sections show generally that vowels no longer retract before Th \( C_1 z \) infixed as \( z' \) in diminutives, and that the same result is in progress before Th \( z \) in \( C_2 \) position.

The vowel change of PS \( u > e \) provides a special insight into the loss of retraction of Th \( z \). PS \( Y > Th z \) preceded PS \( u > Th e \). PS \( u > Th e \) is not yet complete (Thompson and Thompson 1992:12;
4. Consider the following stages outlined for ab initio outlined above for development of and.

Thompson (1979:704). That suggests that Th z is losing its retractive quality, allowing the PS *u > e change to be realized phonetically or no longer impeding this change in progress. E.g., variants kēze? [c] [a*], kēze? [a] 'he lied to her.'

Retraction of other underlying vowels (e.g., u) preceding Th z likewise is being lost. An underlying vowel may remain even though retracted phonetically: c'āk'c'āk'h 'a little sour,' c'āk'c'āk'h 'sour.' In that form, the diminutive infix separates u from the retractive effect of /l/ (is secondarily laryngealized because of diminutive formation.) The converse also is true; a retracting consonant may be inserted by diminutive reduplication, affecting the preceding vowel: q'amq'amq' (pitiiful); q'amq'amq'a Th (a little pitiiful). Concerning Th z, one Th elder (Hilda Austin) says sk'āz-e? [c], while her younger sister (Millie Michel) says sk'āz-e? [c] 'child.' The diminutive for them is sk'ūk'z-e? [c], showing that the underlying vowel is u.16 That indicates that Th z is losing its retractive quality, allowing /u/ to be realized as [a], instead of [c].

Li also may be losing its retractive effect on a preceding vowel. The dialectal variation [k'lez] - [k'leɪt] 'canoe' suggests a change in progress: [c] - [c], where [c] occurs before z (a central resonant) and [c] occurs before l' (a lateral resonant). Furthermore, Li does not retract before z. The loss of lack ab initio of retraction with preceding front vowels before z is understandable, versus the retention of retraction with preceding back or low vowels.17

4. PS *y > Th, Li parallels PS *r > r, l. Together, the state of affairs in Th and Li with the development of PS *y > Th, Li z offer an interesting model with which to consider the PS *r > Interior Salish r, l change. Consider the following stages outlined for PS *r (> *r) > r, r, l, which parallel the stages outlined above for PS *y > z > Th, Li z.

<table>
<thead>
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<td>PS *y &gt; e</td>
<td>C₁</td>
<td>Li, Th, Sh, Ka, Sp, Ok, Cr, Cm (assumed)</td>
</tr>
<tr>
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</tr>
<tr>
<td>PS *y &gt; e</td>
<td>C₂</td>
<td>Li, Th, Sh, Ka, (assumed); Ok (?), Cm (?). (Sp) (attested indirectly), Cr (attested)</td>
</tr>
<tr>
<td>PS *y &gt; l</td>
<td>C₂</td>
<td>Li, Th, Sh, Ka (attested)</td>
</tr>
</tbody>
</table>

We discuss each stage seriatim below.

5. V > V₁[en'] / /l/ | Li, Th, Sh, Ka (attested) |
6. V > V₁[en'] / /e/ | Sp, Ok, Cm (assumed); Cr (attested) |
7. e loses retraction | C₁ | Li, Th, Sh, Ka, Sp, Ok, Cr, Cm (attested) |
8. e loses retraction | C₂ | Th (in progress?); Sh; Ka no; Li? |
9. V > V₁[en'] / /e/ | Sp, Ok, Cm (attested); Cr (in progress?) |
10. V > V₁[en'] / /l/ | Sh, Th (in progress); Li?; Ka no |

We will argue that PS *r was a velarized flap (i.e., retroflex),18 with some lateral effect: [t']. The data below support that reconstruction. The reflexes of PS *r in Interior Salish include [t f t / t' l], showing some retroflex and/or retracted r and / sounds. The r sounds have a central articulation (air passes out in the center of mouth); the / sounds have a lateral articulation (air passes out at the side(s) of mouth). PS *r would have been somewhere between those articulations: a central flap, whose retroflexion created some lateral effect.19 Ladeoged (1971:51) explains:

The central-lateral dichotomy may be applied to flaps, but not to taps and trills. There are a number of languages in which sounds having the characteristic gesture involved in making a flap have in addition a distinctly lateral quality; when the articulation is formed there is contact only in the center of the mouth, so that momentarily there is a position similar to that of an l.

Retroflexion similarly accounts, at least in part, for the lateral effect of Th z.

4.1 PS *r > e (C₁). This change is assumed based on the parallel change of PS *y > z > Th, Li z in C₁ position. 4.2 PS *r > l (C₁). Kinkade and Thompson (1974:24) provide several examples of initial PS *r: PS *rnap* 'bend (wood), *riva* 'rumble,' *rir* 'slime, fishy taste.20 Consider also PS *rux: Cm lax 'lighten, be electric,' Th ldkayl 'Female Thunder Spirit'; PS *ruf: Th lat 'water runs' (lñap 'water in creek' rushes down), Cm ḍakł̓̓ap 'river' (PS *uf > Cm ḍ̓̓ł̓̓h here); PS *fr̓ u* 'fanned out': Cm slı̓ kst̓̓ 'finger,' Th l̓ st̓ st̓ id. (perhaps Sh loanword l̓ st̓ st̓ ); PS *rr̓ eć*, Th l̓ dēc* 'soaking wet,' Sp l̓ dēc* 'soaked through.' The change of C₁ PS *r > l
would be dissimilar and otherwise consistent with the above analysis.

4.3 PS \( \gamma > r \) (Cz). An intermediate retractive \( \gamma \), similar to Cr \( [r] \) but with a lateral effect, is assumed for the northern Interior languages to account for the Li, Sh, Th (and Ka) \( [r] \) that corresponds with \( r \) in the southern Interior languages. That \( l \) retracts a preceding vowel in Li, Sh, Th, and Ka, although \( l \) is losing its retractive effect in some of those languages, as discussed below. One also can infer reasonably from the evidence that all of the southern Interior languages had an intermediate velerized \( r \) \( [r] \) in Cz position, perhaps similar to present day Cr \( r \).

4.31. Coeur d'Alene r. Reichard (1938:532) describes Cr \( r \): "There is a general tendency to draw back the throat in enunciating velars and faucals. In anticipating these sounds the vowels also become affected, so that for instance, \( a \) before \( r \) becomes \( a' \)." Reichard (1958:297) further describes Cr \( r \): "For \( r \) the back of the tongue is pulled down as the apex is turned upward and back, and the voiced trill is exceedingly throaty in enunciating velars and faucals. In anticipating these sounds the vowels also become affected, so that for instance, \( u \) or \( a \) before \( r \) becomes \( u' \) or \( a' \)."

Reichard (1958:297), quoted above, supplies an important phonetic feature for Cr \( r \): "The retained \( r \) of Cr, a back consonant or \( r \) present in Ok Sp \( r \) in 'frog' might reflect a similar phenomenon. If so, the unstressed vowel in 'frog' would reflect PS \( \gamma \), which would have become Ok \( i \) and Sp \( e \) (or have been lost), if Ok Sp intermediate \( \gamma \) was not retractive. Th \( \text{walk'ze} \) 'tree frog' and Li \( \text{wajik} \) 'sound made by frogs' may suggest PS \( \gamma \), which would develop as Ok \( a' \).

Consider, alternatively, these cognates for 'turtle': Sp \( \text{tesik'x} \) (m), Ok \( \text{tarasik} \), Th \( \text{?ayik'x} \) \( [\text{\textgammaayik'x}] \), Cm \( \text{tarasik} \) (M. Dale Kinkade, p.c.). The PS form would be \( \text{?'or(a)ik}' \). That suggests Ok \( r \) was retractive, as otherwise PS \( \gamma \) preceding PS \( \gamma \) would have become Ok \( i \) (if not lost).

Methow is a southern Ok dialect (Kinkade 1967:194). O'Brien (1967) describes an alternation of \( l \) for \( r \) in Methow. O'Brien states that phonemic \( \text{sas} / \text{r} / \) 'cricket' alternates with \( \text{sas} / \gamma / \) (\( \gamma \) as a flapped \( r \), perhaps IPA \( \gamma / r / \) or \( r / \)). O'Brien notes the glottalization of sonnants in diminutives (which we would describe as secondary laryngealization of resonants). We extrapolate the second \( l \) example phonetically as \( [\text{sas} / \gamma / \text{s} / \]'. That doublet shows final \( r \) being replaced by a lateral, most likely \( l \). The \( r \) in 'frog' was argued (mis)perceived as \( l \) due to the laryngealization of CM \( r \) exaggerating the perceptual ambiguity of already phonetically similar Methow \( r \) and \( l \). O'Brien also gives a Methow doublet for 'grapes,' transparently an English loan: [\( \text{kreps} \) and \( [\text{\textkreps}] \). American English \( [\text{\textcreps}] \) (Ladefoged 1993:169), a retroflex approximant, was apparently perceptually ambiguous enough to be interpreted as both Methow \( r \) and \( l \). That suggests something about Methow \( r \): it may have been retroflex, which gave it some lateral effect.

Importantly, the examples of Methow \( r \) above (and examples of Ok \( r \) below) show \( r \) misperceived as \( l \), not vice versa. Th Li \( z \) similarly is misperceived (or realized) as \( l \), never vice versa. That direction of misperception supports a change of PS \( \gamma > r \) in the \( l \) languages, not PS \( \gamma > \gamma \) in \( r \) languages. The direction of the misperception is from a central resonant, velerized and retroflexed, toward a lateral approximant, not vice versa.

4.33. Spokan e r. Spokan \( r \) is not retracted; nor does Sp \( r \) retract a preceding vowel. Carlson (1973:3) describes Sp \( r \) as an "alveolar flap," which might be IPA \( l / \) (Ladefoged 1993:169) or \( r / \). Robert Sherwood (p.c.) describes Sp \( r \) as 'rolled slightly by some, not rolled by others.' Sp \( r \) shows slight retroflexion in words such as \( \text{c'ur} \) 'salt' (cf. Fl \( c'iyi' \) \( [\text{\textc'iyi'}/ \) or \( c'iyi' \) 'cold' (cf. Fl \( c'i'l) \)). Retroflexion of the tongue is visible, and the effects are audible. Sp \( r \) therefore may be described as flapped (showing retroflexion) in some forms; it might have a tapped articulation (no retroflexion) in other forms.

One set of cognates indicates Sp \( r \) once was retractive. PS \( \gamma > \gamma \) \( [\text{\textc'm} \) \( \gamma \) in non-retracting environments; PS \( \gamma > \gamma \) \( [\text{\textc'm} \) \( \gamma \) in retracting environments. PS \( \gamma > \gamma \) \( [\text{\textc'm} \) \( \gamma \) (a later Sp change). See Kinkade and Slot (1972) for the development of PS vowels, summarized in Kinkade and Thompson (1974:24). Consider these cognates for 'bent, crooked': Cm \( \text{york} \) * 'Sp \( \text{york} \) * (Fl, Ka \( \text{yotik} \) * id.), Ok \( \text{york} \) * 'curved,' Th \( \text{zik} \) * 'sp' (curl up'). The PS form would be \( \text{'york} \) * 'whose development in Sp would be: PS

\[ \text{\textzalp'x} \text{got light}, \text{\textzalp'x} \text{[knot] got untied}. \] The retained \( a \) before Ok Sp \( r \) in 'frog' might reflect a similar phenomenon. If so, the unstressed vowel in 'frog' would reflect PS \( \gamma \), which would have become Ok \( i \) and Sp \( e \) (or have been lost), if Ok Sp intermediate \( \gamma \) was not retractive. Th \( \text{walk'ze} \) 'tree frog' and Li \( \text{wajik} \) 'sound made by frogs' may suggest PS \( \gamma \), which would develop as Ok \( a' \).
Another set of cognates adds a special twist to the above: Cm yörk, Sp yér, Ka yadl 'round.' In that set, PS *yörk* did shift to Sp *yer*, because the intermediate *r* already had its retrolingual effect. Th *z* is more retractive in postvocalic position before a consonant (*z* / _V_ / _C_) than in postvocalic position in word final position (*z* / _#/). Sp intermediate *r* likely was more retractive in postvocalic position before a consonant (*r* / _V_ / _C_ ) than in postvocalic position in word final position (*r* / _#/). That would explain the divergent developments of Sp yörk and Sp yér, which ultimately may be related roots (semantics: 'bent/crooked' and 'round').

4.34. Columbia r. Kinkade (1981:b) describes Cm *r*: "flap the tip of the tongue against the hard ridge back of the upper teeth." M. Dale Kinkade (p.c.) further explains that Cm *r* is a retroflex flap [ɾ] in some forms: e.g., *wortorwa* 'blackbird,' *taruk* 'turtle,' *wadk* 'frog'; Cm *r* is a non-retroflex tap [ɾ] in other forms: e.g., *c'art* 'cold,' *mairtep'spruce tree,' *k'něyaq* 'yellow.'

Cm *r* is not retractive, and evidence it once was retractive is elusive. There are, however, several tantalizing clues. First, a Cm doublet suggests that Cm *r* once was velarized and retroflex with a lateral effect: *xar'xar* and *xalxol* 'steepl' (Fl *luhāl*, Ok *xaxdr*, Sh *xāddl*, Cr *lātś(a)rt* id.).29 The *r* arguably was (mis)perceived as Cm *r* due to the laryngealization of Cm *r* exaggerating the perceptual ambiguity of already phonetically similar *r* (perhaps [ɾ]) and *l.*30 Second, there is an interesting Cm *r*: Cm *r* correspondence between apparent cognates Cr *tor* [ʔ] 'be tough, as meat, leather,' and Cm *tqil* [ʔ] 'hard, tough, stiff (ground).31 An earlier Cm *ɾ* may have been misinterpreted as Cm *l*, which remained as such with a retracted lateral (similar to Ka *gkvičet*), while Cm then lost retraction and no longer retracted preceding vowels (similar to Sp *tʃeʃet*). Third, Cm *راجع* reflects a direct English borrowing, initial English retroflex *r* [ɾ] was interpreted as retracted *l*. The interpretation of American English *ɾ* as Cm *ɾ* would suggest a lateral quality for (earlier) Cm *ɾ*, resulting from retraction and retroflexion.

4.35. Summary on Interior Salish r. Modern Interior Salish *r* includes as variants a velarized retroflex flap [ɾ], a plain retroflex flap [ɾ], and a plain, non-retroflex tap [ɾ]. Earlier PS *ɾ* was retractive, likely a velarized, retroflex flap [ɾ]. The correspondence of *r* with *l* in the Northern Interior and Ka suggests that the earlier retroflex flap also had some lateral effect: [ɾ].

4.4 PS *ɾ > 1* (C2) Li, Th, Sh, Ka. That PS *ɾ* in C2 position was retracted and had a lateral effect would explain the change of PS *ɾ > l*. Velarization and retroflexion would have created the lateral effect, as with Th and Li C2 *z* (velarized and retroflexing) being confused with or replaced by *l*. Li *z* neutralizes with *l*, and Th *z* nearly neutralizes with *l*. Laryngealization exaggerates an already existing perceptual ambiguity between phonetically similar sounds. For example, the Ok (Methow) doublet *xalxol* – *xalxol* 'cricket' and the Cm doublet *xar'xar* – *xalxol* 'steep,' discussed above, suggest that Ok and Cm *r* once were velarized with a lateral effect.

Intermediate PS *ɾ* would have been a marginal phoneme, both in terms of distribution, functional load, and its place within the phonological system. That marginality, combined with the perceptual ambiguity with *l*, perhaps led to its association with *l* in Ka, Li, Sh, and Th. The change was perhaps similar to West Germanic *ɾ* > *r* > Scandinavian *r*, where marginal *r* merged with *r* (Smirnitskij 1990:202-203).

Interestingly, Li, Sh, Th all have merged PS *ɾ* and *ɾ* as *ɾ*. (The change in Sh is perhaps not complete.) *A* and *r* are audibly similar, enough so for perceptual ambiguity to allow reinterpretation of *r* as the lateral *ɾ*. Li, Sh, and Th also reinterpret PS *ɾ* as lateral *ɾ*. Cr merged PS *ɾ* and *ɾ* differently, as the non-lateral *ɾ*: Cr also did not reinterpret PS *ɾ* as lateral *ɾ*. That direction of reinterpretation is significant: the *l* languages chose the lateral *ɾ*; the *r* language chose non-lateral *ɾ*. Such differences hint at the efficacy of phonology as functional phonetics (Martinet 1949).

Doak (1983:108) gives several examples of James Teit (in 1908) writing *r* and *l* in cognate or related roots across Okanagan dialects; e.g., words with Ok roots *trq* 'kick' (cf. Fl *tliq*), *yuθ* "cover" (Sp Fl *ylx* "cover, drapes," Cr *ylx*), Nicoodemus 1975:308), *yuθ* "round" (cf. Th *zal* "round/oval") and *yik* "curved." (cf. Th *luluk* "curled up," Sh *yelkur* "bent"). And the word sk*ˈ*raln *sandhill crane* (Fl *skˈ*raln id.) The Ok items showing *r* have cognates in Interior Salish showing *l* (Ka, Li, Sh, Th) or *r* (Cr, Cm, Sp). With Ok *trq* 'kick,' *yik* "curved," and sk*ˈ*raln *sandhill crane,* the *r,* (mis)interpreted as *l* occurs as C2 before another consonant. That position is precisely where Th *z* is most easily misperceived as *l*. Ok *yalb* "cover," wrap may reflect earlier *yux* (< *yur-lat* round-covering), where earlier *r* was misinterpreted as *l* as C2 before another consonant. Doak (1983:108) suggests that the Ok roots *yuθ* (< *yuθ-lat* cover), *yuθ* and *yik* are related historically. Those examples support reconstructing an intermediate velarized *ɾ* with a lateral effect, [*ɾ*]. Again, Mattina (1978:58) indicates that Ok *r* was retractive.

Krueger (1960:34) provides: "[l]n the Flathead pronunciations which I have heard, the *l* has a distinct quality, so much so that in my early work *l* was transcribing it by the make shift symbol *Ɂ*. It gives the auditory impression of an ordinary sonant *l* with simultaneous articulation of an American-type *r*." The direction of the change of Krueger's perceived *Ɂ*, perhaps [*ɾ*], followed through to Fl *l* not to *r*. The change Fl *Ɂ* > *l* would be similar to the perception of Th *z* closer to [*ɾ*] than [*l*]. The direction and momentum of *Ɂ* > *l* would parallel the change of PS *ɾ* > *l* (postvocalic), pronounced *l* (especially for the Mount Currie dialect): PS *ɾ* > *Ɂ* > *l* (l / _V_). That supports reconstructing an intermediate *ɾ* with a lateral effect.33

Krueger comments that Fl *l* had the quality of an "American-type r." As mentioned above in discussing Ok (Methow) *r*, American *r* [*ɾ*] is a retroflex approximant. Krueger's description suggests that
That same root tal'q, have been further studied in 1983:89, (Vogt 1940a:13; Vogt 1940h:l1). This root is a loanword, borrowing from Cr'salt': "The tongue turns back, and the sound comes from the sides of the tongue." He describes the / of c'âl'q [c'â-t'] salt', however, as he does the / of câl [câ] live': "The tongue stays straight, and the sound comes from the sides of the tongue." Fl elder Felicite McDonald (p.c.) confirms such retrolflexion for Fl l, describing the / of c'âl'q (and Testihni 'he reached for it') as: "It curls back." Fl elder Dolly Linsebiger (p.c.) describes the / in those words: "the tongue turns back behind the teeth." Retrolflexion in those forms is visible and audible. No similar retrolflexion of / is evident in c'âl'q 'cold' or câl 'live' for Ms. McDonald or Ms. Linsebiger. Ms. McDonald describes that /: "The tongue is flat." Fl therefore has three phonetic variants for Fl l: plain [l] in câl (<PS *âl), velarized [t] in c'âl'q (<PS *âr), and velarized and retroflex [t] in c'âl'q (<PS *â'r). That distribution suggests that Fl / (<PS *r) has lost retroflexion in all but several forms with â.

Cr tal'q 'kick' also may exemplify velarized *r being misinterpreted as /l. Kinkade and Sloat (1972:237, item 437) and Kinkade and Thompson (1974:25) consider Cr tal'q to be borrowed from Ka talq. If Cr tal'q is a loanword, borrowing from Fl might be as possible as Ka, given the relative contact between Cr and Fl vis-à-vis Cr and Ka. In either case, the phonetics of such a borrowing are problematic. Fl and Ka frequently retain / before / (<PS *r), as mentioned above. In Ka, Fl l'q 'kick' no such / is retained. The Fl root, in fact, has no vowel, and / is devoiced: il'qen (Fl'qen 'kick it' Ka l, / also would devoice (Vogt 1940a:13; Vogt 1940b:11). It therefore is plausible that Cr tal'q derives from earlier *ur'q, where *r (velarized and retroflex r with a lateral effect) was misinterpreted as /l (as Th velarized and retroflex z with a lateral effect is misinterpreted as /l).

Moreover, a PS root *xarq 'kick' is still well-represented in Southern Interior Salish: Cm tar'q, Cr tal'q, Fl il'q, Ka talq (Vogt 1940a:168), Ka talq (Carlson and Flett 1989:209), Ok tr'q, Sp tarq. (Kinkade and Thompson 1974:25 reconstruct PS *xarq 'kick, dance.'). The supposed Fl, Ka borrowing would have supplanted a native Cr root with a very similar phonetic shape. That Cr root still exists in Cr stârl'q 'madmen' (Fl stârlq 'madmen'), which Kinkade and Thompson (1974:25) reconstruct as PS *stârlq'sx'smadmen'. That same root tr'q 'kick' was written by Teit with an l and r across Colville-Okanagan dialects (Doak 1983:89, 108), as discussed above. A laryngealized *r would have had a greater lateral effect than simple velarized *r, and thus have been more readily misinterpreted and replaced by /l. That lateral effect would have been further exaggerated by the position before - Cm PS *r > Cr / would parallel neatly Th laryngealized z' [t] being misinterpreted as /l [t], or Li laryngealized z' being replaced by /l [t].

To summarize, at an intermediate stage PS *r was velarized and retroflex with a lateral effect, similar to Th and Li postvocalic z being velarized and retroflex with a lateral effect (or in one Li dialect actually becoming /l).

4.5. Vowels are retracted before reflexes /, r. Vowels are retracted before Cr r (Doak 1992). Vowels are retracted generally before the Ka, Li, Sh, Th l that corresponds to Cm, Sp, Ok, Cr r. Kuipers (1982:72), in fact, eliminates *r in favor of l retracted to l in roots where such / is preceded by his reconstructed darkened vowels (v, *e, *e). E.g., PS *k'ar'cut, shear' (Kuipers 1982:327 item 44 reconstructs *k'âl): Th k'âl [a] 'cut sheet', Sh k'âl [a] - k'âl [c] 'cut', Fl Ka e'âl [a] 'cut with scissors', Sp e'er [e] id., Cm k'ar [a] 'cut firmly object with shears,' Ok k'ar [a] 'to cut thin material.'
aches, is sore, tinges' (Sp c'7e, Fl c'7âl, 'it hurts, aches'). 'Soda pop' is a neologism, providing a helpful means to interpret a change in progress of Th l > I. Consider also Th k'êlôg 'gall,' k'êlôdû 'a little gall [from small animal]; PIS *k'êlôg 'yellow' Fl k'êlôf1, Sp k'êlôf1 'yellow.' In the Th diminutive for 'gall,' the infix l' does not retract the preceding u vowel. That confirms that the l' is no longer retractor. Consider also Th wâl'k'ez 'tree frog, wâl'k'ez 'little tree frog.' (Sp warâlk'frog). The reduplicated diminutive l' infix does not retract the preceding vowel (z [I] to p [z]). Compare also Th wâl'k'ez 'strong,' Sh wâl'k'ez id., Cr zâr 'firm, strong.' The l in the Th form has lost retraction, and PS *a preceding such l has become Th e.14

In addition, Th l (< PS *r) shows retroflexion in some forms; e.g., mûlâm 'medicine' (Sp mûlâm id., Ik'ûlâm 'yellow' (Sp k'êlôf1 id.). Other forms with l, however, do not show retroflexion; e.g., nûlâm 'cricket' (Sp sêrâlâm id.).

4.10 Shuswap I. The following Sh forms indicate that Sh l (< *r) is losing retraction: Sh p'el - p'i'd 'overflowing' (discussed above); Sh cêl - cêdW 'board' (Th k'ôf1 [z] 'cut'); Sh yôlm - yôlm 'put rope around s.t.' (Sh ye'ôl 'round,' Fl yôl id.), but Sh yûl'H'n 'put rope around foot' (Sh l' would be more retracted than l, given that situation in Th, Li); Sh yêl'k-' 'curve, coil' (Cr yêl'k-' 'curved, crooked'). Kuipers (1974:22) describes Sh retracted vowels: "The vowels of a or â occur almost exclusively near l, l' ... The very rare vowel ð is unstable and is sometimes replaced by a or e, or has a free variant a, an unstressed phoneme often replaced by e." The replacement of Sh â by e [e] represents a loss of retraction in the vowel, which also reflects a loss of retraction in a following l.

In addition, Southern Sh shows k'êl'yellow,' where northern Sh shows k'ôl id. Both would reflect PIS *k'êl 'yellow' (Cm, Cr Kûl, Fl Kûl(Ì), Ok Kûl(Ì), Sp Kûl(Ì), Th k'ôl 'yellow, green'; Li kôl(y) 'yellow, green' (Kuipers 1973:14). Southern Sh k'êl shows a loss of retractive l (l > l), perhaps influenced by its regular l, which tends toward palatal coloring (Gibson 1973:6).

4.9. V > V_{(2)} / l ~ r. Only Cr r retracts preceding vowels. All other r languages (Cm, Ok, Sp) have lost retractive r. The discussion above indicated that Sp r once was retractive (yëk 'good, bent, crooked'), and as was Ok (zårâlk' 'turtle, Methow dialect sårâl'z - sårâl'zal') and Cm (sårâl'z - sårâl'zal 'steep'). Cr r also may be losing its retractive effect; Cr p'ër'flood' was discussed in section 4.7 above. Another Cr root with e [e] before r is nér 'paint.' That [e], however, might reflect retracted i(Ì) (Doak 1992:3). Nicolodunus (1975:306-07) also has two forms that may suggest loss of retraction before Cr r: yasp 'it (circle) rolled,' but yërep 'wagon, carriage (lit. wheel, wheel).'</p>

Loss of retraction of vowels before r in Cm, Ok, Sp and perhaps Cr would parallel the loss of retraction of vowels before Th, Li z.

4.10. V > V_{(2)} / l ~ l. Examples in section 4.8 above indicated that some vowels are no longer retracted before Sh, Th l (< PS *r). Loss of retraction of vowels before l in Th and Sh would parallel the loss of retraction of vowels before Th, Li z.

5.0. Perceptual ambiguity of marginal C$_2$ resulting in PS *r > l. Ohala (1974, 1981, 1986) argues that sound change can result from the listener's misapprehending an inherently ambiguous speech signal. Sound change originates in a listener's misinterpreting synchronic phonetic patterns; sound change results from systematic perceptual errors. That approach may explain certain sound changes better than a strict articulatory approach.37 Consider the change of [x] to [r] in English, in such words as enough (OE geohn), laugh (OE bleahhan). An unconditioned change of velar [x] to labio-dental [r] motivated by articulatory factors would be extraordinary. A change motivated by acoustic (and hence auditory) factors, however, would be transparent. Velar fricative [x] was misperceived and reinterpreted as labiodental fricative [r].

That one dialect in a language has r (Sp) and another has l (Ka) suggests a phonetically similar, intermediate sound allowing for perceptual ambiguity. That ambiguity could have been interpreted differently (or misinterpreted to follow Ohala). That earlier common segment likely was a velarized and retroflex *, perhaps [x], with some lateral effect. Ka developed the sound's accompanying lateral into velarized w, which exists today and retracts preceding vowels.38 Krueger noted some r-coloring for Fl l (his l), suggesting retroflexion; Fl still shows retroflexion in certain forms (with preceding a). Sp would have lost the velarized quality of earlier *r-and hence the lateral effect-and it remained r. Vowels are not retracted before Spokane r (but once were). Cr r would approximate the intermediate phonetic shape of PS *r in Interior Salish, as [r], retracting preceding vowels, not (yet) shifting to l (Li, Th, Sh, Ka) or r (Cm, Ok, Sp). We do not know whether Cr r presently has any lateral effect or its degree of retroflexion. Sixty years of interference from English r since Reichard did her Cr fieldwork (1927, 1929) may be a problem.

On the perceptual ambiguity of liquids in syllable final position (C$_2$), consider Lloyd's (1987:246) discussion of fricative of Andalusian Spanish r:

The weakening of the pronunciation of l-ll and l-xl had reached a point in some areas that they were no longer clearly distinguished in syllable-final position. The resulting articulation may be similar to that of the lateral in other positions. Thus, in modern Andalusia a commonly found realization of the archiphoneme of liquidity is simply an alveolar fricative [l], an alveolar flap [r], more rarely a multiple trill [r], or an alveolar lateral [l]. Even rarer are a fricative somewhere between a lateral and an alveolar fricative [l], a pharyngeal aspirate [h], a semivowel [l], a palatal [I], or a cacuminal lateral [I]. Similar realizations are found in America.

The correspondence between Lloyd's descriptions and IPA symbols is problematic, but the point is made nonetheless. (A cacuminal lateral would be a retroflex lateral.) Assuming the accuracy of Lloyd's phonetic descriptions or symbols, those reflexes show the potential for considerable perceptual ambiguity with Andalusian Spanish final liquids r, l and consequent sound change.
Fagan (1989:217-218) adds further guidance on the Andalusian frication of r, l. Fagan gives as the principal variants of r and l (using his symbols and descriptions): []' rd. alveolar fricative, [r] voiced alveolar flap, [l]] mixed articulation, and [l] alveolar lateral. The most favored merger is r to [l]. I also shifts to [][r] in locases where the merger of l, r is gradual, the majority use [l]. In some locases, the merger is r to [l]. That data suggests how an intermediate velarized PS r in syllable final position could have been misinterpreted as r in one dialect (e.g. Fl, Ka) or reinterpreted as plain r in another (e.g. Sp), across the respective Interior Salishan languages.

The most favored mergers of l to [a] and the intermediate sound [l] are significant, as they show the relationship between the initial l and retroflexion (i.e., the retroflex rhotic approximant *). That relationship surfaced several times in the discussion above. It adds further support for retroflexion as a phonetic component of PS r, allowing for its misinterpretation as a lateral in the l languages.

Two western Amerindian languages, Keresan and Tarascan, show a retroflex r misinterpreted as l or replaced by l. Spencer (1946:233) describes Keresan r: "The trill r is a voiced retroflexed alveolar flap, alveolar retroflexion imparting a lateral quality." Friedrnbch's (1971, 1984) descriptions of Tarascan retroflex r are especially interesting. Friedrnbch (1971:165) describes the r phonemes in Tarascan as "a front alveolar flapped r and a retroflexed flapped r with considerable l color." Tarascan retroflex r is "a phonetically complex realization in contrast to simple flapped r, a front alveolar tap." All Tarascan dialects have a marked l-color for the retroflex r, and some linguists (Foster and Swadesh) refer to Tarascan r as a lateral (Friedrnbch 1971:175). "The retroflex Tarascan r' with lateral color merges largely or with high frequency the simple lateral l in some dialects." Friedrnbch (1984:81) further describes Tarascan r: "The lateral /l/ overlaps phonetically with the marked /l/-color of the retroflex lateral /l/, and the two phonemes merge fully in the speech of many children, some adults, and the dialects of two towns."

With the PS r and y changes, there likely is an articulatory component to sound change, in the perceptual ambiguity component for sound change. A velarized sound involves a secondary raising of the back of the tongue towards the soft palate; a uvulized sound has lower tongue raising and is further back (Caford 1977:192-93). A lateral sound is produced by lowering the middle section of the tongue, which allows air to flow out the mouth near the molars (Ladefogd 1971:105). The retraction of the tongue apparently would be consistent with some lateral release. The interplay of retraction and retroflexion requires further research; they may tend to cooccur in Salish (e.g., Th r, Cr r).

Why would PS r > s move more quickly away from velarization (Cm, Sp, Ok), but PS r > s > l (Ka, Li, Sh, Th) not move so quickly away from velarization? Perhaps velarization is more compatible with laterals than with nonlaterals. Consider, for example, Russian velarized l with its palatalized counterpart f; the difference between them is much more pronounced than with velarized t and palatalized d (e.g., Rus. [jat]"heat" vs. [jd]]i]"cook"). Perhaps a retracted tongue root may be harder to maintain with a central approximant than with a lateral approximant. A retracted tongue root may not be as easy to maintain as an unretracted tongue root. A retracted tongue root (velarization) evidently tends to destabilize sounds. There are many cases of velarized l vocalizing as a labiovelar central approximant (w or v-like sound) in different regional and social dialects (BEV) of English (and in English historically), in Brazilian Portuguese (postvocalic l, Camara 1972:44), and in Russian dialects, Polish, Wendish, Slovak, Serbo-Croatian, and Slovene (Entwistle and Morison 1949:196, 306, 370). Importantly, Li z may syllabify as [l]; e.g., [focc] - [foca]'________' (van Eijk 1985:15 n. 5). That suggests that postvocalic velarized sounds tend to vocalize (Li z > x) or adjust toward a more oral articulation (Sp r; Russian l > w > v, Entwistle and Morison 1949:196).

There may be greater incompatibility of retracted tongue root for C1 (pre-vocalic) vis-à-vis C2 (post-vocalic). There may be a tendency of C2 segments to front; consider perhaps the change of Proto-Romance *l to Catalan l initially, but to l intervocically. Consider also the pronunciation of (light) l in RP British English in C1 (syllable initial) but of l in C2 (syllable final). There also may be a tendency for C1 segments to strengthen relative to other positions, as with Proto-Romance *r > Spanish r in initial position (#__); e.g. raro [rraro].

Thus, the various reflexes of PS r can be explained in terms of adjustments made by both the speaker (articulation) and listener (misperception and reinterpretation).

6.0. Summary. PS r > z > Th z/a, Li z/l parallels PS r > s > l: (1) Th, Li z is velarized in C1 position; PS r was velarized; (2) Th, Li z has a lateral effect, leading to perceptual ambiguity with l in C1 position; PS r had a lateral effect, leading to perceptual ambiguity with l in C1 position (in Ka, Li, Sh, Th); (3) Th, Li z retracts preceding vowels; PS r retracted preceding vowels; (4) Th Li z is losing its retractive effect on preceding vowels; PS r similarly lost its retractive effect on preceding vowels in Cm, Ok, and Sp, and may be losing such effect in Cr. In short, the same general sound change that caused PS r to velarize to z or even Li l also occurred with PS r.

Certain sound changes reoccur in languages and within language families. Consider rhotacization in Latin (e.g., vfl, vres) and later in Sardinian (Latin ius desen, Sardinian sur desen) (Mendelhoff 1969:31); rhotacization in Germanic in various forms (e.g., Scandinavian plural marker -r); rhotacization in certain Greek dialects (Buck 1928:52-53). Rhotacization of sibilants (s or z) in and across those Indo-European languages would parallel the retraction and consequent lateral effect on resonants in Salish-affected first PS r, and then PS y.

The retraction and consequent effect on resonants also may explain, in part, the change of PS r > s in eastern Halkomelem (Thompson 1979:706; Elmendorf and Sutcliffe 1960:6-7) and the sporadic correspondence of n and l in Interior Salish. The n - l interchange may derive from perceptual ambiguity between l and a velarized n. The retraction of the tongue--as with Th Li z--would be accompanied by a lateral effect: [n']. Retroflexion may also play a role in the articulatory dynamics and perceptual ambiguity. That lateral effect would be exaggerated by the laryngealization. That ambiguity likely is heightened with laryngealized n' and l'; Sp ntip't and Fl tip't 'spider'; Th sk'ul'; Fl xel'ar 'rock rabbit'; Fl pil'ye?; Sh pin'lex"
 Problems with Kuipers's approach. Kuipers (1973, 1976, 1981, 1982) treats r as PS *r retracted by a preceding vowel or feature. Applying that approach evidently would require: PS *h > *h (Ka, Li, Sh, Th) > *r (Cr) > *r (Cm, Ok, Sp). There are several problems with that approach.

7.1. Retracted vowels occur before l in Cm, Cr, and Sp. Cm has a retracted a vowel before l (presumably i) in the following roots: Cr mal* 'come to boil' (Reichard 1939:94) or 'bubble' (Doak 1992:92), cf. Ka mal* 'bubble' (Vogt 1940a:152); Cr mal* 'uncomfortably warm' cf. FI ndul* 'lukewarm', CM mal* 'warm' (Czaykowska-Higgins 1990:93); zul 'redhot'. Cm also shows retracted vowels before l, e.g., Cm nul 'light', Sp nul* 'light'. Sp also shows retracted vowels before l, e.g., Cm snul* 'light'. Kuipers reconstructs three consonant-vowel consonant formations (cf. Kinkade and Thompson 1974:24). If one interprets PS *r as a back consonant (reflexes Ka, Li, Sh, and Th l and Cr r [r] pattern with back consonants), then it would be consistent for PS *r to tend not to retract before PS *r. Also would explain why Kuipers would not have good support to reconstruct PS *r: i did not exist. PS *r, *u also did not exist. Instances of retracted vowels before l, Li, Sh, Th l and Cr r reflect retraction before a back consonant, not the converse. Kuipers's (1982) approach also creates a nonmetrical PS vowel system, with four plain vowels and three retracted ones: PS *i, *u, *u, but *r, *a. Th shows i as a back phoneme, principally before l (< *r) (Thompson and Thompson 1992:12); e.g., kyl 'cut sheets, {kyl}'gap between two pieces.' Th l in such forms can be explained as *i retracted by following l, not vice versa. Th has numerous paired roots, one with the other with a, the i roots have an augmentative meaning, while the a roots have a simplex meaning (Thompson and Thompson 1992:87-88). Th roots showing i would follow that pattern: kyl 'cut sheets of cloth, kyl 'cut single sheet of cloth.'

7.5. PS *r versus *l questionable. Kuipers's approach apparently requires a PS *r and *l. He states: "One should therefore first reconstruct *l-r* rather than *r-l*..." (1981:324). He adds: "I shall for the moment posit as an ancestor of r not *l* but *l* (1981:329). He also states that PS opposed plain l to retracted l as a whole" (1981:331). He concludes: "r as C2 developed from *l* which was the positional variant of *l* after the retracted vowels, and the latter were excluded after a uvular C2--hence r is found only as C2 after a nonuvular C1* (1981:331). A system with *l* opposed to *r*, however, would be extraordinary. "A language with two or more liquids is most likely to include a lateral/nonlateral contrast between them." (Maddieson 1984:88). "A language most often has two liquids (usually one lateral and one r-sound)." (Maddieson 1984:89). Kuipers's PS system contradicts what is known about the occurrence of liquids in languages generally.

7.6. Development of PS *r > r, l problematic. The sequence Kuipers (1982) apparently advocates for PS *l > l is: (1) a 'darkening feature' retracts a vowel (Kuipers 1981), or the vowel is already retracted (Kuipers 1982); (2) the retracted vowel then retracts the following consonant PS *r to *l, which would have to account for the modern reflexes e, r, l (and preceding vowels); (3) the vowel loses retraction; (4) the consonant loses retraction; or, (3b) the consonant loses retraction (why would it lose retraction following a retractive vowel?); (4b) the preceding vowel loses retraction. It is odd that a vowel would retract a consonant, only then to lose retraction after causing the consonant to retract. There are many examples, however, of consonants retracting preceding vowels (especially Th Li z), and there is evidence of consonants losing retraction (e.g., Th l, z), with consequent effect on preceding vowels. Kuipers (1982) reconstructs three PS retracted vowels *r, *u, *u, without accounting for their reflexes in Interior Salish or elsewhere. The reflexes for PS *r, *u, and *u in Interior Salish and elsewhere are unsubstantiated and otherwise problematic. That Kuipers would not have good support to reconstruct PS *r, versus *r, *u, *u, actually supports reconstructing a retraction PS *r. PS *r tends not to retract before back consonants; PS *r, *u, and *u tend to retract before back consonants (cf. Kinkade and Thompson 1974:24).
The PS /r alternative is better motivated: (1) the PS consonant retracts in C₁ and C₂; (2) the consonant in C₂ position retracts the preceding vowel allophonically (the underlying vowel remains); (3) the consonant in C₁ and then C₂ position loses retraction (because velarized consonants are relatively unstable); (4) the underlying vowel surfaces as untracted before the untracted intermediate consonant in C₂ position. The evidence from PS /r > Th z has followed that sequence exactly and strongly supports that sequence for PS /r > r, l. The data above on the respective r and l languages are consistent with that sequence.

8.0. Problems with Doak's approach. Doak (1989) does not reconstruct PS /r, contrary to Kinkade and Thompson (1974). Nor does Doak reconstruct a 'darkening feature' or darkened vowels that retract progressively in articulatory motivation for corresponding consonant retraction in r-I languages (Cr, Cm, Ok, Sp). Moreover, Doak reconstructs PS retracted roots. Doak argues that a certain retractive feature ('pharyngeal node') attaches to the syllabic nucleus, not to the syllable's vowel proceeding it. Doak also does not explain why Th l and apparently Sh l is losing retraction. A rule delinking progressive retraction harmony (from vowel toward l) also would not explain that change. Doak's approach is similar to Kuipers's, and it suffers similar drawbacks. Both focus on an articular motivation for corresponding r and l, where perceptual motivation likely was primary, as with Th, Li z > l. Both avoid PS /r, opting instead for an abstract feature to convert a PS */r* into C₂ r. Kuipers's (1973, 1976, 1981) 'darkening feature' affects a vowel, retracting it, which then retracts a following consonant, PS */r* > r. For Doak, the difference in shape between r (Cr, Cm, Ok, Sp) and l (Li, Sh, Th) depends on where an abstract retracting feature ('pharyngeal node') attaches. If the 'pharyngeal node' attaches to the C₂ default consonant l, then r results. If the 'pharyngeal node' attaches to the syllable's vowel preceding l, then l results. Doak does not explain why Li, Sh, Th, Ka l is retracted (as is Cr r), but Cm, Ok, Sp r is not. One would expect the opposite result, given that the 'pharyngeal node' is attached directly to the l in deriving r. Doak also does not explain Cm r, l, and l.

Moreover, with Cr c'or 'sour, salt' and Fl c'ol id., the vowel is the same, retracted [s]. Both Cr and Fl show a retracted consonant following that [s]. Both Cr and Fl [s] apparently would have the so-called pharyngeal node attached to them and the following consonant, Cr r [t] and Fl [t], [±]. It is suspect to treat the Cr and Fl derivations differently.

Th data show Doak's and Kuipers's approach does not work. Th l retracts a preceding vowel, not vice versa: c'[uf]c'[u]/'a little sour' (from c'[uf]c'[uf]'sour') (from c'[uf]c'[uf]-). The root is c'[uf]'sour'. When underlying u is separated from the retractive l by the reduplicated diminutive infix [c'], u surfaces as [u], not a [s]. When underlying u is not so separated, u surfaces as [s]. Th c'[uf] has cognates in the r languages; e.g., Cm c'[uf]'sour, salty,' Sp c'[uf] id.; Fl Ka c'[uf] id.). Those cognates suggest PS */r/*r. The change of PS /s > š, ŋ would reflect velarization of the central vowel.44

Consider also Th c'[uf]-'salt' and its diminutive c'[uf]/c'[uf] 'a little salt.' The root is c'[uf]'salt' (y). When underlying e is separated from the retractive l by the reduplicated diminutive infix [c'], e surfaces as [e], not a [v]. When underlying e is not so separated, e surfaces as [a]. Th c'[uf] has cognates in the r languages; e.g., Cm c'[uf]'salt' (see cognates above for 'sour'). Doak argues that the 'pharyngeal node' attaches to the vowel (syllable nucleus) in those words, which allows the l to surface. The Th data show that retraction is part of itself, not the preceding vowel. Doak's attempt to explain l and r based on the place (vowel versus consonant) for attachment of an abstract retracting feature ('pharyngeal node') fails.

The change of PS /r > Th Li z provides a more concrete and reasoned means to explain Cm, Cr, Ok, Sp r and Ka, Li, Sh, Th l. A consonant (PS /r, */r*) is retracted, which then retracts preceding vowels in C₂ position. The retracted consonant in C₂ position has a lateral effect, which makes it perceptually ambiguous, and ultimately it is misinterpreted as a lateral for some languages or dialects. That change has occurred for PS /r in Th and Li. It is a certainty. One can infer reasonably that the same process occurred with PS /r. That inference is preferable to speculating about the behavior of autosegments and a default consonant, where one must construct language specific rules for blocking or delinking retraction harmony.

9.0. No PS */Qvr roots and the dissimilation issue. There are no extant reflexes of PS */Qvr roots showing C₂ r. Kinkade and Thompson (1974) suggest that the */r in such roots dissimilated to l (*/Qvr > Qvl), accounting for C₂ l in roots such as Cm Cr Ka Sp Th qu'l 'cheat.' The l in such roots is not retracted l. The dissimilation suggested by Kinkade and Thompson (1974) remains a promising explanation. Ferguson (1975:186) writes: "[I]n Arabic, as in other Semitic languages, it tends to be true that the closer two consonants are to each other in phonetic content the less likely they are to cooccur in the same root, and on this basis it is possible to identify distribution of classes of sounds which tend to coincide with phonetic classes (Greenberg 1950)." Doak (1992) suggests that the uvulars (Q) and r act as members of a class in Cr (at least as it relates to retracting preceding vowels). PS */r* at one stage would have been an r with retracted tongue root (i.e., velarized r), which would put it in the same class as Q. The lack of reflexes for PS */Qvr roots with C₂ r would be dissimilatory, similar to the phenomenon in Semitic.

There apparently were PS roots */Qvr* or */r*/*r/*r*, which would suggest that */r* in C₁ position would have lost retraction as dissimilation with a following uvular or pharyngeal. See section 4.2 above (*rač, *rīs, *rāl, *rī'āc).
Dissimilation might explain the following apparent cognates for 'stomach': Li *sal', Th ml[y]g, Fr *tulon, Sp *tule. The PIS form would be *t*(a)l. An early dissimilation of PS *r > Th l would have allowed the subsequent change of PS *r > Th y to occur.

10. Syllable position as conditioning environment. Syllable position—C₁ initial versus C₂ postvocalic—can itself be a conditioning environment for allophonic differences and eventual sound change. For example, Kiowa l does not occur word-initially; l otherwise is realized as [i] in syllable-initial position, [i] in syllable-final position, and slightly devoiced and postvocalic position in those respective languages: allowed the subsequent change of a conditioning factor for sound change, and loss of velarization is generalizing from (once within Th territory). (Th itself be a conditioning environment for allophonic differences and eventual sound change. For example, Kiowa / does not occur word-initially; PS terms. They were borrowed from mid) vowels. That would be analogous to the developments of (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; the distribution for Warao (d r l], with (1] described as a 'lateral tlap'; 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or even *-malt* might be PIS alternatives. Cf. Ok retracting root *mil* ‘smear’ (e.g., *mil-a-m* ‘smear’).

Cognotes for ‘lukewarm’ present similar problems for Kuiper's approach. The roots show a retracted vowel before /l/ in Fl *nulil* ‘lukewarm liquid,’ and *nul* ‘lukewarm.’ Kuiper's and Doak's approach would require the /l/ in the Cm form to retracted to /r/. Expressing such forms as a secondary development avoids a real problem for Kuiper's ‘darkening feature’ or retracted vowel approach, instead of addressing it. Again, the PIS root likely contained a pharyngeal element that retracted the vowel, perhaps *mil, *mil-a, or *mil. Cf. Ok *mil-ul* ‘lukewarm.’

Several Sh roots with /l/ (< PS *r/) are retracted roots. That cooccurrence can be explained as a secondary development of retraction harmony, probably analagous to retraction caused by *r/. That is, PS *r > l/, which in turn retracted the preceding vowel and otherwise caused retractive harmony of subsequent vowels. Fl *suwapi* ‘white man’ presents an interesting example of retraction harmony developing secondarily. Fl *suwapi* likely is a borrowing, perhaps through Nez Perce (cf. Aoki 1975:194-95); Nez Perce *suw-p/5, Sauaptin *suwapi*. (A form of that word occurs widely on the Plateau.) Fl *suwapi*, however, can be a retracted root: *suwapi* [s*] ‘he assumes white man's ways,’ from *suwapi-s-t-šut/ (white man-causative-transitive-reflexive). Elsewhere, however, that root does not retract fellow vowels: *suwapiťs* [š] he caused it to be like the white man's, from *suwapi-s-t-čas/ (white man-causative-transitive-third subject). The expected retracted surface vowel would be ą. Retraction in forms with /suwapi/ must have developed after PS or PIS.

13. Other linguistic considerations for PS *r*. Treating r as a retention of PS *r* instead of an innovation from a retracted PS *l* implies that languages (Cm, Cr, Sp, Ok) are more conservative than I languages (Salish generally), at least concerning PS *r*. If the r languages are, in fact, more conservative generally than other Salishan languages, then that would support r being a retention.

We assume a correlation between greater extralinguistic contact and greater language change; e.g., Icelandic versus English, Lithuanian versus Latvian, or Shoshone versus Comanche. More contact, more change; less contact, less change. Interior Salish has had less pervasive contact than Coast Salish, Tsamosan Salish, Tillamook, or Bella Coola. The Northwest Coast area had great linguistic diversity, exogamous marriage and extensive trade prevailed, and there was extensive multilingualism. Compared to the Northwest Coast Sprachbund, the northern and eastern Plateau where the Interior Salish settled was relatively insulated. One therefore could hypothesize that the Interior Salish, who migrated to the Coast from the Interior (Kinkade 1990b), would be more conservative linguistically than Salishan groups elsewhere.

The data support the hypothesis that the Interior Salishan languages were conservative compared to the other Salishan languages. Interior Salishan languages have retained the PS phoneme inventory to a much greater extent than the non-Interior Salish languages, whether one accepts Kuiper's (1970, 1973, 1976, 1981, 1982) or Thompson's (1979) PS system. All Interior languages have retained PS pharyngeals *r, *r-a, *r-č, *r-č-a,*52 apparently lost elsewhere in Salish. Most Interior languages (except Cr, Ka, Sp) have retained PS *k, *k-a, *k-č, *k-č-a; instead of innovative *č, *č-a, *č-č, *č-č-a. They found generally outside of Interior Salish, with a few exceptions such as Bella Coola and within Tsamosan (e.g., Cowitz; see Kinkade 1973). The northern Interior languages (and the northern Ok dialects) have retained PS *y, *y-a; the southern Interior reflects PS *y as y (Cm, Sp, Ka) or j (Cr). PS *r, *y-a apparently has been lost elsewhere in Salish. Most of the Interior Salishan languages reflect the full complement of PS transitive and related suffixes: pretransitives *-mi relational, *-t (t) reflexive, *-l indirective, *-n noncontrol, *-n direct; transitives *-s transitive, *-sw reflexive, *-s-m reciprocal. Th and Sh have retained a PS subordinate *sw, with Tillamook and some Coast Salish languages (Thompson 1979:727; Newman 1980:163). The Interior languages transparently reflect additional PS morphemes: PS *-ps- 'active,' PIS *-ps- 'active.'

Within the Interior itself, Cm and Ok probably are the most conservative. Only Cm, Ok, and Sp have retained PS *r-a and *s-a; while Li, Sh, and Th have merged *r-a and *s-a as 'A; Cr has merged *r-a and *s-a as 'l. Cm and Ok (with Cr, Sp, and Ka) also have retained the pretransitive suffix *l reflexive, lost or unproductive in the northern Interior, with reflexes in southern Lushootseed dialects (Thompson and Thompson 1980:28-30; Thompson 1979:741-43; Kinkade 1980).

Cm has the most conservative Salishan vowel system, reflecting most closely the PIS vowel system (Kinkade and Sloat 1972). For instance, only Cm (and perhaps a dialect of Sh) did not front and/or raise PS *u; PS *u-a > Sp *u > Li Ka Th Sh e > Cr Ok i.54 Cm likely reflects the PS vowel system (*u, *u-a, *u-a) most closely. Concerning PS consonants, Cm shows only two significant innovations: PS *y > y, and PS *r > h. Cm otherwise has been most conservative regarding PS *r, which has devoiced to f in many Salishan languages (Thompson 1979:719).

Cm also has been very conservative in retaining the original PS pronominal system, which had a neutral object paradigm and causative object paradigm (Newman 1979b:300-301). Compare Newman's PS reconstructions with the Cm reflexes: neutral paradigm 1s *-c Cm -co, 2s *-ci Cm -ci, 3s *t Cm -t, 1p *-al Cm -al, 2p *-alum Cm -alum; causative paradigm 1s *-mv Cm -m, 2s *-mi Cm -m, 3s * - Cm -p, 1p *-mut Cm -al, 2p *-mut Cm -m.55 More generally, Newman's (1977, 1979a, 1979b, 1980) or Hoard's (1971) reconstructions for the PS pronominal system (possessive, transitive subject, independent) indicate that Cm has one of the most conservative pronominal systems. Cm also has a reflex ( *wa-a) of PS topial object *wali, which otherwise occurs only in Tsamosan Salish, Lushootseed, and Tillamook (Kinkade 1990a). Cm is overall one of the most conservative Salishan languages, and it is an r language.
Other southern Interior languages are likewise conservative phonologically and morphologically. Ok, for instance, retains the PS consonant system, except for shifting PS *r* to r and shifting PS *y* to y in southern dialects (e.g., Colville). Ok apparently reflects a retracting feature *f* (Mattina 1979), which has been lost as a segment elsewhere in the Interior. The existence of *r* remains, however, in morphophonemically conditioned retraction of vowels in other Interior languages. Ok is an r language.

Those data indicate that the Interior Salishan languages are more conservative generally than other Salishan languages, and that the southern Interior languages are the most conservative overall. Importantly, the southern Interior Salish also retained much of the original Salish kinship system (Elmendorf 1961), while it was changed largely elsewhere in Salish. Such conservatism would be consistent with *r* being a retention in the southern Interior languages (Cm, Cr, Ok, Sp), not an innovation.

14. Conclusion. Kuipers (1973:11) posits a PS feature *f* "reconstructed in abstracto," to account for the reflexes *l*, *r*. Kuipers (1976:2) later offers an abstract feature "darkened " to account for *l*, *r*. Kuipers (1981:324) then posits a 'darkening feature' / *l/ to account for *l*, *r*, referring back to Kuipers (1973). Kuipers (1982:72) finally gives phonetic shape to the retracting feature in the form of PS "darkened (retracted, pharyngealized) vowels *y*, *r*, *v*" to account for *l*, *r*. Kuipers's approach starts with an abstraction, which then moves toward and eventually finds some phonetic reification. Doak (1989) similarly starts with an abstraction, the theoretical construct of nonlinear or autosegmental phonology, and then integrates phonetic data into it.

The known facts of languages generally and Salish specifically must be the basis for careful reconstruction of PS sounds. Resorting to abstract notions such as a 'darkening feature,' 'darkened' vowels, default consonants, linking and delinking of autosegments, blocking retraction harmony, and so on, diverts from that salutary principle. Our analysis starts with the known as the basis from which to speculate as to the unknown. We start with the concrete--phonetics--and move toward the abstract. Kuipers (1973, 1976, 1981, 1982) and Doak (1989) assume the reverse order.

Proto-languages are languages, and they should act as such. The best way to see what may have happened in a proto-language phonologically is to look at what does happen in its descendant languages. In the above analysis, we look at the present, concrete phonetics of two northern Interior languages (Li, Th) to reconstruct what may have happened with the phonetics of Proto-Salish. We have attempted to show that the development of PS *r* > Th, Li z explains the development of PS *r* > *r*, *l*, *l*. We conclude that reconstructing PS *r* is better motivated than reconstructing PS *l* plus an abstract retracting feature such as Kuipers and Doak propose.

Finally, the comparative method generally treats the phonemes of descendant languages to reconstruct the phonemes of their parent language. The phonetic nature of those phonemes often is considered secondarily, if at all. For PS *r*, Kuipers, Doak, and Kinkade and Thompson consider primarily the phonemes *r* and *l* in the descendant languages. We considered as primary the phonetic nature of those phonemes in different environments. In C1 position, PS *r* > *l*. In C2 position, the reflexes of PS *r* have the following shapes: / *l/ 1/ = [ *l/ 1/ {l} ]

<table>
<thead>
<tr>
<th>Cm, Cr, Ok, Sp</th>
<th>Ka, Li, Sh, Th</th>
</tr>
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<tbody>
<tr>
<td>r</td>
<td>r</td>
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Considering retraction, retroflexion, and varying degrees of lateral effect associated with those features allowed us to see parallels with PS *y* > Li, Th z. Those parallels, in turn, helped us to unravel the development of PS *r*.
Hereafter, *'* will be represented collectively as *', unless otherwise indicated. We abbreviate the Interior Salish languages as: Cm Columbia, Cr Coeur d'Alene, Fl Flathead, Ka Kalispel, Li Lillooet, Ok Okanagan (includes Colville), Sh Shuswap, Sp Spokane, Th Thompson. Unless otherwise indicated, the Interior Salishan data are from: Cm Kinkade (1981a), Cr Reichard (1939), Ka Vogt (1940a), Li van Eijk (1985 or personal communication), Ok Mattina (1987), Sh Kuipers (1974), Sp Carlson and Flett (1989), Th Thompson and Thompson (forthcoming), Fl, Ka, and Sp are members of a dialect continuum, all mutually intelligible. Fl and Ka are virtually the same dialect. Ke may be interpreted as the inclusive term for Ka and Fl. As a practical matter, however, data marked Fl are from Egesdal's fieldnotes on that dialect proper, while data marked Ka are from Vogt (1940a).

1. The correspondence of *r* with *l* in Li, Sh, Th, and Ka is exemplified below. See also Doak (1989-94), Thompson (1979-707,711), Kinkade and Thompson (1974:23). For correspondences with *l* in Tsamosan Salish, consider, Ct park *'*pierce,* Chehalis p*illow-*pierce, go through,* Cowitz pal*alk* *'pierce* (Kinkade and Sloat 1972:2, item 728); Pis t*nor*,'hang' (Fl Iul id, Sh zal*alition off by hanging mat or curtain,* Cr tar 'one hangs'), Seshelt *lidl-at* 'hang transitive' (Kuipers 1982:85).

2. We hereafter will cite Kuipers, van Eijk, and Timmers as "Kuipers (1973)," following Kuipers (1981).

3. We use the value *I* to represent the uvular, voiceless fricative (IPA *). We use the Americanist * elsewhere in this paper (for IPA *).

4. It is an orthographic convention among Interior Salishanists to indicate retraction with a subdot under the character: *f* → [t], a velarized lateral approximant; Cm Li Th z → [s], versus the blade articulation *s* that sounds similar to English *š* [ʃ]; Cm Li Th c → [ç], versus the blade articulation *ç* that sounds similar to English *â* [æ]. *r* is not used, nor is *z*. Where relevant, retracted *r* and *z* are represented with the superimposed tilde .

5. van Eijk (1985:7-8) provides the examples in this paragraph, among numerous other examples. The basic phonetic values for Th vowels are: *i* (I) generally, *e* after uvulars or pharyngeals; *e* (I); *u* (u) generally, *o* after uvulars and pharyngeals; *o* [ɔ]; *a* [a]; *ə* [I], *ə* [x], *i* [e]. Thompson and Thompson (1992:21-21) fully describes Th vowels. van Eijk (1985:3) uses differing symbols for Li vowels: *a u u a are broadly [o u a], while * a u are [a e o a]* "Van Eijk's *e* can be IPA *e*, i.e., a centralized, high, close-mid front unrounded vowel (as for Th i). There is some confusion in comparing the Th and Li material, as van Eijk writes for [c]; Li a [a] = Th e [ç] for the material below.

6. One's first transcriptions of a language often reflect subtle phonetic detail later overlooked when one has phonemicized the sounds. On Egesdal's first day of Th fieldwork (June 1981), he transcribed the word for 'gill net' as nzalk*ut*in, later corrected to nzak*ut*in. He noted that the perceived *l* was very "dental." He was confused about the fricative effect of that perceived *l*, and he noted that *z* in initial position is easy to discern. Those first impressions remain accurate descriptions of Th *z* in those positions. Notes from the Th field methods class at University of British Columbia (1987-88, 1989-90, 1990-91), taught by M. Dale Kinkade, include helpful phonetic comments on Th *z*. The speakers are Dorothy Ursaki, (Spences Bridge dialect) and Mandy Jimmie (Merritt dialect). Th *z* is transcribed generally as dental [z]. Specific comments are: 10/11/89 (Book 1, p. 29, item 126) *'sagun 'I love you,' with comment (p. 28) *'s has much lateral quality here." 2/21/90 (Book 1, p. 117, item 507) *'sagun *' I use it,' with comment (p. 116) "very *d-like."

7. Concerning the feature laterality, Ladefoged (1971:56) states: "It is difficult to conceive what might be meant by in-between values for this feature. At the systemic phonemic level sounds are either lateral or they are not (in which case they are central); and the same seems to be true at the phonetic level." Th *z* however, apparently shows varying degrees of laterality. Laterality of Th *z* increases from (1) no laterality to (4) almost fully lateral: (1) initial (*~*), (2) simple postvocalic (*~*), (3) postvocalic before consonant (*~*), and (4) when lateralized.

9. Kuipers (1976:3) also suggests Th *y* is phonetically *d: "In northwestern [InteriorSalish] *y > δ . . . ." Bracketed material is added.

10. van Eijk (1985) uses * to represent the uvular, voiceless fricative (IPA *). We use the Americanist * elsewhere in this paper (for IPA *).

11. Th, Li, z functions as a resonant (not obstruent), as do Th Li, f, * and their laryngealized counterparts (*, *'). In the IPA framework, conversely, *y, *'*, * * are placed as obstruent fricatives. The change of PS *y > z* Li (M) *l*, then, is a change occurring within that class of resonants. The change of PS *y > Th y* also is a change within that class of resonants. A change of PS *y > Th y* would complete that almost circular shift of PS resonants: *y > Th z* (which can be retroflexed and lateral), *y > Th y*, and *y > Th l*.

12. The change of palatal [*I*] > the palatal sibilant *j* in Castilian Spanish would represent almost a reverse shift from a lateral to a *z-like sound; e.g., *leste > leste; olo > olo; folo > foja; melore > mejor* (Lloyd 1987:254).


14. One might expect intermediate stages from PS *y > Th z*. Fagan (1989:224) discusses friction and fronting of *y* (IPA *j*) in Andalusian Spanish, giving as variants of *j*: *j* vd. frictionless palatal consonant, *j* vd. prepalatal, slight friction, *j* vd. prepalatal, medium friction, *j* vd. prepalatal, full friction, *j* vd. dento-alveolar, full friction. Compare also Proto-Romance *y > Portuguese *j* [ʒ]; e.g., Latin *lium*, Port. *juto*. In northern Japan *j* is common for *y*; the Fukushima dialect has *j* for *y* in certain words (Martin 1987:19). It is questionable whether PS *y > Th z* included an intermediate postalveolar consonant *j*, with later velarization (and retroflexion) resulting in *j*. (Russian *j* is velarized, showing the possibility of a velarized postalveolar.) The primary allophone of Th *z* is postalveolar [f], and the primary allophone of *c* is postalveolar [t]. They occur in all but retracting environments. The voiceless counterpart of Th *z*, Th *s* is [*j*]; if Th *z* was earlier *s*, it is unclear why such intermediate *j* would have moved to *z*. Moreover, PS *y > Th c* [ts], a non-palatalized affricate, where Th *c* conversely is postvocalic [tf]. Perhaps PS *y* became Th intermediate *d*, which as a marginal sound merged with the
nearest sound *c' (perceptually and in terms of the phoneme inventory); i.e., intermediate *d' ([de?]?) merged with *c' [ts'] not *c? [t]. In comparison, PS *γ > Li *z.

15. That a position before coronals would impede PS *γ > Li *z makes sense, considering that retraction is the source of the change. PS *γ before Li non-coronal (velars, uvulars) would be consistent with retraction, while PS *γ before Li coronals would not be. Compare the velarization of l across English dialects; in American English the change is generalizing from syllable final to syllable initial position, impeded by front high (and perhaps) mid vowels; in British RP l is still unvelarized in syllable initial position.

16. The Sh cognate is sk’uk’ye ‘child.’ Consider also Th sk’uk’yz [s] ‘aunt,’ sk’uk’yzz ‘auntie,’ k’uk’yz ‘aunt (vocative);’ Sh sk’uk’yz id., Fl sk’uk’yz ‘man’s mother.’

17. In Fl Ka, PS *i did not retract before uvulars, but *u is neutralized with o [a], and e [ɛ] is neutralized with a [u] before uvulars or l (< PS *r). That pattern parallels the retraction of vowels before Th, Li *z.

18. Ladefoged (1993:168) distinguishes between a flap [t] and a tap [ɾ]. “In a tap, the tip of the tongue simply moves up to contact the roof of the mouth in the dental or alveolar region, and then moves back to the floor of the mouth along the same path. In a flap, the tip of the tongue is first curled up and back in a retroflex gesture, and then strikes the roof of the mouth in the post-alveolar region as it returns to its position behind the lower front teeth.”

19. Mithun (1979:162) reconstructs Proto-Iroquoian *r, which has reflexes *r, l in the descendant languages. She comments that “*r may have been a lateral” (1979:163). Perhaps Proto-Iroquoian *r was phonetically [*ɛr], which might account for the reflexes *r, l.

20. Some additional reflexes for the PS roots in Kinkade and Thompson (1974) are: Fl Fër ‘fishy smell/taste’; Ok lwoksm ‘ring a bell,’ Fl lwu ‘bell rings (by itself).’

21. Old English r has been characterized as back (uvular) based on its effect on preceding vowels (Lass and Anderson 1975). Danish uvular r [ɾ] also retracts preceding vowels.

22. Nicodemus (1975:75) describes Cr o as the sound in English or. Reichard (1938:529) had described Cr o as the sound of English law (“but with the tongue farther back”). Nicodemus’s description may suggest something about the phonetic nature of Cr r, as well; i.e., Cr r is still retroflex as with American English r [ɾ].

23. Krueger (1967:9) has swardq̓’xam ‘young frog.’ Krueger (1967) often mistakenly writes uvular q, q’ for the respective velar counterparts k, k’. Krueger’s form very likely represents swardk̓’xam, transparently cognate with Ok sward’k̓’xen.

24. Th also has səwə̱k̓̓ ‘sound frog makes’ (Egesdal 1992:19 & n.20). That form may be a borrowing from southern Interior Salish (perhaps Ok). It might instead reflect archaic speech (Egesdal 1992, ch. 5).

25. Krueger (1967:9) gives Cm araliq̓′ (see note 24). Krueger also writes Cm blade articulation s as l.

26. Cf. also Upper Chehalis ʔalalik ‘turtle’ (Kinkade 1991:310). PS apparently had two words for ‘turtle.’ The other word was *sp’ar’q̓′alqs; Sp sp’aq̓′alq̓′, Fl sp’aq̓′alq̓′, Cr sp’ar’k̓′alqs, Sh sp’alq̓′ ‘turtles.’ Reichard (1938:544) mentions that velars and their correlate uvulars vary in certain words. Cr ‘turtle’ probably was historically *sp’ar’q̓′ulqs.

27. Interior Salish cognates for Mwhot’cricket’ are: Cm sır’sur’, Cm šál’hur’ (Krueger 1967:11; see note 25), Fl sált, Ok sárur, Sh sál (certain kind of cricket), Sp sérer, Th šíhšel.


29. Kuipers (1982:85) reconstructs PS *xul’ ‘sleep.’ That etymology does not work well, given the Cm doublet. The Cm doublet apparently shows secondary glottalization of the resonants *r, l (< PS *r).

30. Importantly, there is no retracted vowel in either form; i.e., no evidence of Kuipers’s darkening feature or darkened vowel.

31. The vowel correspondence of Cr o [a] to Cm e [a] could be explained in two ways. First, it might reflect velarization of a central vowel in Cr (PS *r > Cr o) and retractive lowering of that vowel in Cm (PS *r > Cm o). The velarization would parallel the velarization of short vowels in Latin, discussed in note 44 below; the lowering would parallel the lowering of Old English e > ə before r (and l); e.g., Old English steora, English star, German Stern, Latin stella, Greek aster. Second, the correspondence of Cr [a] to Cm [a] might reflect the lowering of a high back rounded vowel in Cr (PS *a > o) and the centralization of that vowel in Cm (PS *a > Cm o). The lowering in Cm would follow a regular Cr phonological rule (Doak 1992), while the centralization in Cm would parallel centralization of Th u (< PS *u) before retractive e; e.g., sk’é’stel [ε] – sk’i’stel [ɛ] – sk’i’stel [ɛ].


33. Krueger did his Fl fieldwork in the 1950s. Copies of his tape recordings we have heard are of poor quality. We therefore cannot confirm his perception of Fl l as ɾ. Today no such r-coloring of Fl l is evident, although ɾ is retroflex in certain forms (with d). That may reflect almost 40 years of further interference from the dominant language English. Schütz (1981:27-33) discusses how English as a dominant language effected a change in Hawaiian phonetics: the alternation of a fricated [w] – [w] was reinterpreted as [v] – [w].

34. Mattina (1979-24 n.8), Kinkade and Sloat (1972:44), and Kuipers (1970:52) discuss ablaut for Interior Salish.

35. PS *a > Sh e [ɛ], at least in the dialect Kuipers (1974) covers. See Kuipers (1974:26). The l in the Sh form therefore has retained its retractive effect on the preceding vowel.
...vowel. Vogt notes that native speakers of Norwegian generally have a trilled r, and the Oslo dialect has a tapped r except when it is rapidly spoken. Vogt has heard no such trilled r for Sp r, even where r is reduplicated as r ¿ in the typical Southern Norwegian, but this might suggest a similar confusion of Sp r, and perhaps r more generally in Interior Salish, which has been changed due to interference from English. (Vogt may have misheard Sp r, too.)

40. A similar confusion of l and n exists in Chinese. Dow (1972:32-33) describes Chinese l as articulated slightly further back than English l, resembling a palatal instead of an alveolar; people throughout the Yangtze Valley and some speakers of Cantonese often confuse l with n. (Dow 1972:32-33). Perhaps the backing of the l results in that confusion with the n similar to the PS *n > Eastern Halkomelem l or sporadic Salishan l — n correspondence.

41. Cr shows u [u] retracted to o [u] in the lexical suffix for 'ground, earth' -ulhm's*x. Sh does the same for cognate -ilims*x. Ok similarly shows retracted d for t of cognate -ilats*x.

42. Certain Cm data suggest that forms with a retracted C show pharyngealization of the root but not of the copied augmentative prefix x'ir/. That difference in pharyngealization suggests that the root underlyingly is x'ir(T a representation accepted by a literate Cm speaker). The augmentative prefix would copy only the CVC of the root, not C, T. That would also explain the difference in pharyngealization in the forms. We thank M. Dale Kinkade for bringing this data to our attention.

43. Kuipers (1981:330) seems to leave open the question of whether *tf was opposed to *rf at least in a late stage of PS. He then discusses the Interior Salish reflexes as if *tf was a protophoneme, although he never squarely states whether PS *tf and *rf ever were opposed. Kuipers (1982:72) apparently abandons PS *tf, stating instead that "PS *r is eliminated in favor of *t (retracted to [l] in roots with darkened vowels ...")

44. That development might parallel the development of short vowels before Latin velarized l. Latin had a 'dark' l [l]: before such l, and unaccented ̣ became ̣o, and ̣o > ̣a more generally, unless preceded by u or v (e.g., facul, faculat, but facilis; molia > multa); later the change of ̣o > ̣a in those environments as well (vold > volat, vulgar > vulgus, parvatis > parvulus) (Sturtevant 1920:79). Compare also the change of Middle English a > Modern English ə: before it; e.g., ME talke(n) [tolkæn], MnE talk [tək] (Moore 1929:29). Consider the velarization effect of those dialects of English have a uvular trill r (e.g., Northumbrian 'burr'); e.g., here as [hi:]. Lass 1976:187). The German uvular trill r may vocalize as [x], described as high, back, unretracted but as peripheral as [u]: e.g., besser / besəʃ/ as [bɛʃ] (Griffen 1982:310).

45. In the Merritt dialect, one finds corresponding pairs Th c’i̱t [s] 'sour' and its diminutive c’i̱t/c’i̱t [I] 'a little sour.'

46. A truly retracted vowel, conversely, stays retracted in such diminutive formations; e.g., māq’i [i], 'fly,' mām’c’e [k] 'little fly.'

47. Other examples of PS *Qv or *Qv: PS *tvrax: Th q’las 'fill gap,' Cm q’alld ‘fence.'

48. Cm also the velarization of German l / _# or / _c, in the North Saxon, Lower Elbe region; e.g., Lief [l] 'body,' Pahl [t] 'pole' (Keller 1961:355). That development also shows syllable position itself can be a conditioning factor for consonantal change (as with Proto-Romance initial *l > Catalan P).

49. The bracketed L forms in this section are based on words in Williams (1979). We have attempted to convert to IPA the practical orthography used in Williams, consistent with the phonetic description in van Eijk (1985).

50. The t of the Fl reflexive suffix -st is truncated as a frequent and regular Fl phonological rule: XVY > XV.

51. We do not wish to imply that extensive language contact was absent on the Plateau. Aoki (1975) alone would dispel such a notion. We do suppose, however, that in relative terms the degree of language contact was significantly greater for Salish on the Northwest Coast than for Salish in the Interior. The greater similarity among Interior Salishan languages versus the greater diversity among Coast Salishan languages also may reflect a late separation of PS from the larger body of Salish and slower divergence of the Interior Salishan languages thereafter.

52. Cm has developed PS *t to [l] [l]. Pharyngeals have been lost sporadically in some Interior languages; e.g., Pray Fi ɛaw, Sp ɛar, Cm k’il, Ok ət.

53. We thank M. Dale Kinkade for sharing his comparative Salishan materials with us, from which we have extracted the material presented in this sentence.
54. Egesdal hears Sp e lower than Fl e. Sp e is closer to [a'] or [e] (but not as open as English [e]); Fl e is closer to [c].

55. Newman's Cm object reflexes differ from those presented in Kinkade (1981b), the latter of which we assume to be correct. Kinkade (1981b:104) gives: non-causative (neutral) 1s -sil-s, 2s -sil-s, 3 -θ, 1p -sil-i, 2p -sil-i-lm; causative paradigm 1s -m, 2s -m, 3 -θ, 1p -sil-i, 2p -sil-i-lm.

56. Thompson (1979:728) reconstructs a retracting feature *r, which differs from the pharyngeal resonants reconstructed as *y, *y', *y", *y"". That series is reflected in the Interior as f, f', f", f"", respectively.

References


Language Universals Project. Stanford University.


