# The /əə̣/ patterns of Spokane-Kalispel-Seliš

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Black (1996) claims the phonemic identity of root vowels plays a major role in stress assignment in Spokane, the phonology relying on the underlying distinction between full vowels in strong roots and schwa in weak roots. Additionally, that study identifies schwa as the epenthetic vowel and as the vowel underlyingly present in certain weak suffixes. While stress patterns of Spokane-Kalispel-Seliš support these claims, surface values of stressed vowels represented as orthographic **e** demand a refinement of the analysis. Assessment of strong and weak roots with stressed **e** suggests that the underlying distinction is based on the presence of the full vowel /**e**/ in strong roots and retracted schwa /ə̣/ in weak roots. The relevance of /ə̣/ is extended to epenthesis and weak suffixes. In this analysis, data from across the dialect continuum indicate that stress assignment relies on the phonemic opposition between full vowels /**ieuoa**/ and the schwa-class vowels /əə̣/.

## 1 Introduction

The Spokane-Kalispel-Seliš language is a member of the Southern Interior branch of the Salishan language family. The ancestral territory for speakers of this language extends from the Columbia River in Washington to the foothills of the Rocky Mountains in Montana. Today, tribal lands are limited to treaty holdings, and most speakers of the language live on the Spokane or Kalispel Reservation in Washington or on the Flathead Reservation in Western Montana.

Spokane is the westernmost dialect in the continuum, its speakers originally inhabiting an area that straddles the Spokane River to the north, the Columbia River to the West, the Snake River to the south and a line that approximates today's Washington-Idaho border to the east. Further to the north and east lies the territory of the Kalispel whose language comprises three major sub-dialects: Lower Pend d'Oreille, Chewelah, and Upper Pend d'Oreille. The ancestral homeland of the Kalispel extends from Canada up the Pend d'Oreille River into northern Washington, east into Idaho to include all of the area around Priest and Pend d'Oreille Lakes, and continues up the Clark Fork River into present day Montana to include the area extending from the northern end of

Flathead Lake, south around the lake to an area approaching the Bitterroot Range between Plains and Missoula, Montana. Bitterroot Seliš (Flathead) is the easternmost dialect in the continuum, its speakers originally inhabiting an area that swept from the Bitterroot Valley north up the Seeley-Swan corridor and east to foothills of the Rocky Mountains, perhaps beyond Bozeman, Montana.

As is the case for all Salishan languages, the Spokane-Kalispel-Seliš language is endangered. Today, there are fewer than 200 people who still speak the language, although various language preservation efforts are underway. As a unique form of cultural expression and as a repository of history, science, the arts, and tools for ordinary living, this language occupies a position of great social significance. As a unique expression of the linguistic capacity of the human mind, it is also scientifically significant. The death of this language then would represent an incalculable loss.

The dialects vary throughout the grammar in interesting ways. Most notable for the phonology are the following characteristics: the frequency and extent to which speakers truncate words relative to the stressed vowel; the application of regressive retraction to derived vowels; and the presence/absence of /r/ in the phonemic inventory. An examination of these dialect differences is beyond the scope of this paper; instead, this investigation explores speakers' special knowledge of the strong/weak distinction as revealed by the stress patterns in the language, examines the quality of the stressed vowels exhibited in those patterns, and exposes the /əə̓/ phonemes responsible for those patterns.

## 2 The strong/weak distinction

The terms strong and weak have long been used in Salishan linguistics to describe classes of roots and suffixes. Consequently, it is appropriate to consider the basis for such a distinction before presenting an analysis of the facts.

### 2.1 Evidence for the strong/weak distinction

For those unfamiliar with the terms strong and weak, it is useful to review some of the common stress patterns that provide evidence for such a distinction in the Spokane-Kalispel-Seliš language. While the data[1] provided in

[1] Examples were selected from among only those roots whose strong or weak status has been confirmed in two or more dialects. Sources include Black (1991-92, 1992-94, 1995, 1996, 1995-2000, 2001), Carlson (1972), Carlson and Flett (1989), Carlson and Bates (1990), Giorda (1877-79), Krueger (1960, 1961a,b, 1965), Pete (1998), Speck (1980), and Vogt (1940a,b). Unless otherwise indicated, however, examples are presented in the Spokane dialect (Black 2001). Morpheme segmentation is provided only for surface forms; consequently a morpheme by morpheme gloss is not included.

Tables 1-5 do not cover all the patterns displayed in the language, these data are sufficient for present purposes.[2]

First, it is important to examine forms that lack suffixes since they limit the possibility for stress placement. In such forms, primary stress is assigned to a root vowel. Regardless of the status of the root as weak or strong, the stressed vowel is always realized as a full vowel and represented orthographically as **ieuo** or **a**. The forms provided in Table 1 serve as examples.

**Table 1**: Stressed vowels **ieuoa** in strong and weak root forms without suffixes.

| | **Strong roots** | **Weak roots** |
|---|---|---|
| (1) | a. **hi p̓íx̣**<br>It stings. | b. **hi x̓íl**<br>He's still. |
| (2) | a. **x̓ék$^{w}$**<br>He left. | b. **hecq̓éy̓**<br>It's written. |
| (3) | a. **x$^{w}$úy**<br>He went. | b. **hi c̓úk$^{w}$**<br>It's stiff. |
| (4) | a. **čn móq$^{w}$**<br>I've had enough to eat. | b. **hi p̓óq̓$^{w}$**<br>It's powdered. |
| (5) | a. **t ʔác̓x̣**<br>He looked over at it. | b. **hestáq**<br>It's held back. |

Since vowels that bear primary stress are always realized as full vowels, it is not possible to determine the strong or weak status of roots in non-suffixed forms. In fact, the most reliable way to determine the status of a root is to check whether or not the root vowel bears primary stress when that root co-occurs with so-called weak suffixes.

In the event that the root co-occurs with one (or more) weak consonantal suffix(es), a strong root will retain primary stress on a root vowel, and a weak root will shift primary stress to an epenthetic[3] vowel in the suffixal domain. Such suffixes include *Middle*, *Out-of-control* reduplication, and various imperative markers, among others. The forms provided in Table 2 serve as examples.

[2] For a detailed analysis of stress assignment, see Black (1996).

[3] Black (1996) demonstrates that epenthesis, not metathesis, is the relevant process in such forms.

**Table 2**: Strong and weak root stress patterns in forms with weak consonantal suffixes.

| | Strong roots | Weak roots |
|---|---|---|
| (6) | a. p̓íx̣-x̣<br>He accidentally got a burn. | b. x̓ʷl-íl<br>He died. |
| (7) | a. q̓ʷéɬ-t-m<br>He carries it on his back. | b. čn q̓ẏ́-ím<br>I wrote s.t. |
| (8) | a. y-eʔc-xʷúy-m<br>I'm taking it with me. | b. c̓kʷ-úm<br>He poked. |
| (9) | a. móqʷ-qʷ<br>It was too much to eat. | b. p̓q̓ʷ-óq̓ʷ<br>A powdery substance spilled accidentally. |
| (10) | a. ʔác̓x̣-n-t<br>Look at it (sg)! | b. č-tq-én-t<br>Chase it (sg)! |

In the event that a root co-occurs with one (or more) weak suffix(es) containing a vowel, the presence of the suffixal vowel(s) instigates a stress shift only in the weak root forms. In this case, a strong root will again retain primary stress on a root vowel, and a weak root will relinquish stress to a vowel in the suffixal domain. Such suffixes include *Nonperfective*, *Redirective*, and various subject and object person markers, among others.

**Table 3**: Strong and weak root stress patterns in forms with weak suffixes that contain vowels.

| | Strong roots | Weak roots |
|---|---|---|
| (11) | a. p̓íx̣-n<br>I seared it. | b. x̓l-p-s-t-én<br>I stopped him. |
| (12) | a. x̓ékʷ-š-t-n<br>I took it away for him. | b. t̓eʔkʷ-ší-t-n<br>I took it ashore for you.[4] |
| (13) | a. q-s-xʷú(ʔ)y-i<br>They're going to go. | b. q-s-tkʷ-p-mí<br>He acts like he's smothering.[5] |

[4] When stressed, this week root vowel surfaces as [ɛ] as in t̓ʔékʷ *He came ashore.*

[5] When stressed, this weak root vowel surfaces as [u] as in hi túkʷ *It's close-knit.*

| | | | | |
|---|---|---|---|---|
| (14) | a. | móqʷ-qʷ-m-i-s<br>It was too much for him. | b. | n-p̓q̓ʷ-n-t-és<br>He put a powdered substance in it. |
| (15) | a. | ʔácx̓-n-t-xʷ<br>You watched him. | b. | tq-n-t-éxʷ<br>You touched it. |

Despite the patterns displayed in Tables 2 and 3, it is not always the case that primary stress is assigned to strong root vowels. In the event that a root co-occurs with a strong suffix, stress will shift to the vowel of that suffix regardless of the root's status as strong or weak. Examples of strong root forms are provided in Table 4.

**Table 4**: Strong root stress patterns in forms with weak and strong suffixes.

| Strong roots - weak suffixes | | | Strong roots - strong suffixes | |
|---|---|---|---|---|
| (16) | a. | wíč-n<br>I saw it. | b. | čn wč-n-cút<br>I saw myself (reflected). |
| (17) | a. | x̓ʷél-n<br>I abandoned him. | b. | x̓ʷl-nú-n-t-m̓<br>He was abandoned. |
| (18) | a. | púls-t-n<br>I killed him. | b. | s-pls-t-wéʔxʷ<br>battle. |

Interestingly, the language also has surface forms that give the impression of homophonous[6] roots; that is, they seem to be based on identical roots when the root vowel is stressed. In the event that weak suffixes appear on the roots, however, the strong/weak stress pattern emerges. The forms provided in Table 5 serve as examples.

**Table 5**: Strong and weak root stress patterns.

| Strong roots | | | Weak roots | |
|---|---|---|---|---|
| (19) | a. | hec-láq̓<br>It's buried. | b. | hec-lq̓-láq̓<br>It's diced. |
| (20) | a. | láq̓-n<br>I buried it. | b. | lq̓-n-t-én<br>I sliced it. |

[6] In fact, these forms are examples of minimal root pairs, each pair comprising one strong root member with a full vowel and one weak root member with plain or retracted schwa. Weak root minimal pairs are discussed below in section 3.2.3.

| | | | | |
|---|---|---|---|---|
| (21) | a. | púx$^{w}$-m<br>He blew his breath out. | b. | hi púx$^{w}$<br>It smells. |
| (22) | a. | púx$^{w}$-n-t<br>Blow on s.t. (sg)! | b. | hi px$^{w}$-úx$^{w}$<br>It got to smelling. |
| (23) | a. | ʔúx$^{w}$-t<br>It's frozen. | b. | hec-ʔúx$^{w}$<br>It hangs down. |
| (24) | a. | ʔúx$^{w}$-n<br>I froze it. | b. | ʔux$^{w}$-ʔux$^{w}$-n-t-én<br>I made all that hang down. |

There are also some roots that display an inconsistent stress pattern when accompanied by weak suffixes; that is, data collected under a single root heading show both strong and weak stress patterns. The root √k$^{w}$en *take, grab, catch, sing* is one such root that shows irregular stress patterns across the dialect continuum. It may be the case that forms gathered under a particular root heading which show inconsistent stress patterns should actually be sorted under separate roots.

## 2.2 The source of the strong/weak distinction

Most studies of the various dialects of the Spokane-Kalispel-Seliš language assume that the vowels of both strong and weak roots are underlyingly specified as /ieuoa/. This is consistent with the fact that all stressed vowels surface as allophones of these phonemes. In order to account for the variability exhibited in the placement of primary stress, such studies have posited a host of lexically-specified morphological traits for both roots and suffixes. The same is true for studies on other Salishan languages as well. Many have relied on the terms strong and weak as morphological labels that express a morpheme's tendency to attract or shift primary stress. While such an approach may prove successful for other Salishan languages, it fails to explain the facts of primary stress placement in the Spokane-Kalispel-Seliš language.

Conversely, Black (1996) provides an analysis of the strong/weak distinction in the Spokane dialect that relies on the phonological characteristics of vowels rather than on lexically-specified diacritics of morphemes. In that analysis, the stressed vowels of weak roots are not identified as underlying /ieuoa/, but rather as phonologically-conditioned realizations of phonemic schwa that necessarily surface as full vowels. That analysis also identifies the epenthetic vowel as schwa and argues that it too is phonologically conditioned to surface as a full vowel. It further posits a category of schwa-class vowels which appear in a number of weak grammatical suffixes, but whose surface forms may be contrary to the phonological conditioning exhibited by root and epenthetic schwa.

The present study supports an analysis of schwa as an epenthetic vowel and as phonemic in weak roots and suffixes, albeit with one refinement: Epenthetic vowels and the underlying vowels of weak roots and suffixes are best identified as either plain or retracted schwa /əə̣/. Evidence for the inclusion of retracted schwa in the phonemic inventory is based primarily on the facts pertaining to forms with root-stressed orthographic **e**.

An assessment of strong and weak roots surfacing with stressed **e** vowels suggests that the underlying distinction is based on the presence of the full vowel /e/ in strong roots and retracted schwa /ə̣/ in weak roots. The relevance of retracted schwa is extended to epenthesis and to a subset of weak suffixes. A review of data from a variety of sources[7] indicates that the same argument holds for the dialects across the Spokane-Kalispel-Seliš continuum.

An analysis which relies on the distinction between full and schwa vowels provides a principled account for the fact that the vowels of strong and weak roots are not valued by the constraints of stress assignment in the same way. Furthermore, an analysis which identifies both plain and retracted schwa as phonemic has other advantages.

First, it explains the positions occupied by weak root vowels in the non-canonical root forms CCVC, CVCC, and CVCVC(VC). Unlike the analysis provided for its sister language Moses-Columbia, the position of weak root vowels in Spokane-Kalispel-Seliš cannot be a consequence of epenthesis. Given the varied locations of weak root vowels and a lack of uniform conditioning environments, their positions within such roots are not predictable and can only be accounted for by acknowledging their presence underlyingly. Second, it explains the stress patterns associated with weak suffixes as well as the stressed vowels that surface in all but two of those suffixes.

Finally, it must be emphasized that the specification of /əə̣/ as the relevant phonemic representations for the epenthetic, weak root, and weak suffixal vowels has a logical source in the proto-language and so is not based on whimsy. This analysis argues that these phonemes are inherited intact from Proto-Salish[8], and that the synchronic reflex for Proto *ə *ə̣ remains /əə̣/. Certainly, phonological innovations have occurred relative to these vowels: one is the development of a constraint which prohibits /əə̣/ from surfacing (as allophones such as [ɘɜ]) with primary stress, and another is the vowel shift of /a/ to /e/. Significantly, these innovations have not resulted in the merger of *ə *ə̣ with any full vowels. The sound patterns of the language demonstrate that plain and retracted schwa remain synchronically relevant for the phonology.

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[7] See footnote 1 for a list of sources.

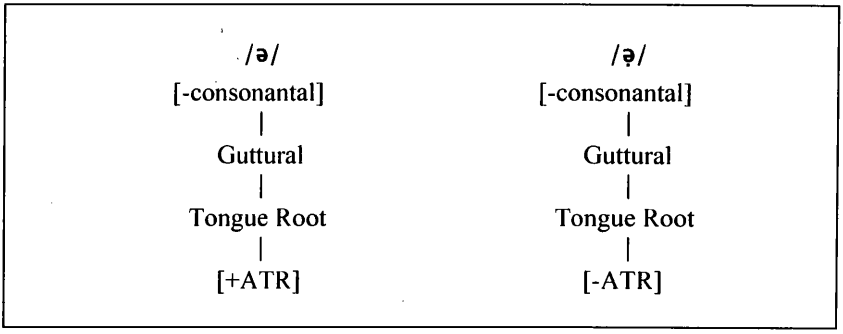
[8] Thompson (1979) states "roots were either `strong', with tense vowels; or `weak' with *ə" in Proto-Salish. Kuipers (1981, 2002) reconstruct both *ə *ə̣ for Proto-Salish.

## 3 The /əə̣/ patterns

### 3.1 Representations of /əə̣/

The fact that the phonology values full vowels more highly than /əə̣/ is not really surprising when possible representations of these vowels are considered. From an articulatory perspective /əə̣/ are neutral in that they lack oral place features, unlike their full vowel counterparts. As such, they may be represented using the feature geometry proposed in Halle et al. (2000) as presented in Figure 1.

**Figure 1:** Possible representations of /əə̣/




Although recognizable as sonorants, their lack of oral place features may make them unable to project a proper syllable head. As a consequence, the phonology finds them less suitable for the purpose of bearing primary stress, preferring full vowels instead. In the event that a full vowel is unavailable underlyingly then, the phonology requires that /əə̣/ fill out the requisite place features in order to meet the burden of primary stress assignment. Simply put, /əə̣/ must assume the characteristics of a full vowel in order to surface in stressed position.

The precise phonetic realization of plain schwa is most often determined by neighboring consonants, surfacing in the range of **[i]** or **[u]** in non-retracting environments and **[ɔ]** or **[ɑ]** in retracting environments. It is represented orthographically as **iuo** or **a**. Retracted schwa typically shows only the minimal effects of coloring from neighboring consonants, surfacing in the range of **[ɛæ]** or **[e]** in non-retracting environments or as **[ɑ]** in retracting environments.[9] It is represented orthographically as **e** or **a**.

The terms *retracted*, *retracting*, and *retraction* require some clarification. When applied to the phonemic representations of vowels, the term *retracted* is here assumed to refer to the feature Advanced Tongue Root [ATR].

[9] Black (1996, 1998) use the symbol [a] to represent both the low central and low back variants of /a/. Colleagues correctly suggest that IPA standards be observed.

Vowels that are phonemically retracted are presumed to have the underlying specification [-ATR]. When the term is applied to vowels that are retracted as a result of phonological processes triggered by *retracting* consonants or roots, it is here assumed to refer to the feature Retracted Tongue Root [RTR]. Retraction of vowels is presumed to have resulted from the spread of the feature [+RTR] and, where relevant, concomitant vowel specification of the feature [-ATR]. The phonological processes associated with the term *retraction* are complex and cannot be fully described here;[10] however, a few generalizations should suffice.

Regressive retraction (or faucalization) is a process by which a post-velar consonant lowers and backs a vowel that precedes it. A pharyngeal may retract any vowel that immediately precedes it; a uvular may retract any (non-prefixal) vowel except /i/, even if that vowel does not immediately precede it. Regressive retraction of derived **[i]** or **[u]** (resulting from consonant vocalization) varies by dialect.

Progressive retraction (or pharyngealization) is triggered by a pharyngeal consonant or by a floating pharyngeal feature present in retracting roots, also resulting in the lowering and backing of the affected vowel. Pharyngeals retract in a strictly local manner; that is, a pharyngeal retracts a vowel which immediately follows within or beyond the root.[11] Conversely, progressive retraction triggered by a floating pharyngeal lowers and backs any stressed vowel within or following the root morpheme.

### 3.2 Weak root /əə̩/

While the weak status of many roots has been determined by the stress pattern of suffixed forms, it is often not possible to determine the phonetic identity of the root vowel in those weak roots. A number of characteristics of the grammar conspire to create this situation.

Although the grammar permits words comprising only bare roots to surface, most words are composites of roots and affixes. In weak root forms with suffixes, primary stress is assigned to a vowel in the suffixal domain. This, coupled with the fact that unstressed vowels are deleted,[12] usually results in the loss of the weak root vowel. Thus, it is often the case that weak root forms with the root vowel stressed are unavailable. Additionally, the phonetic quality of any unstressed vowel that surfaces within the root must be viewed with suspicion, since such vowels most likely show the residual effects of vowel reduction, vowel excrescence, consonant vocalization, or retraction. The result

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[10] For a detailed discussion of the phenomenon in Salishan, see Bessell (1992, 1998a,b).

[11] An exception to this generalization involves rounded pharyngeals and is discussed in section 3.2.1 below.

[12] Unstressed vowels may surface for a number of reasons: as a result of *Repetitive* infixation; as a means of meeting the surface needs of laryngeals not underlyingly adjacent to vowels; when protected by a laryngeal or pharyngeal consonant; and as a consequence of consonant vocalization or of excrescence.

is that the phonetic values of the vowels of many weak roots have yet to be determined.

Despite this situation, the existing data set contains an ample number of clear examples to illustrate the /əə̣/ patterns associated with weak roots. Of the 252 confirmed weak roots, the stressed forms of the root vowels break down as follows: forty with [i], thirty-one with [u], nineteen with [ɔ], thirty-eight with [ɛæ] or [e], and fifty-four with [a]. The stressed vowels of the seventy remaining confirmed weak roots have yet to be identified.

Overall, the data indicate that the phonology places no restrictions on the root environments within which retracted schwa may occur. Roots which contain plain schwa, however, tend not to include unrounded guttural[13] consonants or a floating pharyngeal feature. The conditioning environments associated with the allophonic patterns of weak root /əə̣/ follow directly.

### 3.2.1 Weak root plain schwa: /ə/

In order to assume the requisite characteristics of a full vowel for the purpose of bearing primary stress, root /ə/relies on feature-sharing with neighboring consonants. The allophones of stressed root /ə/ surface in the range of [iu] or [ɔ] and are represented orthographically as **iu** or **o**.[14] The conditioning environments for these allophones can be identified with few exceptions. The environments are presented below and headed by the relevant orthographic symbol.

(25) a. Orthographic **u**

Plain schwa is represented as orthographic **u** in 'rounding' non-retracting environments, that is when followed by a rounded velar. Examples include: **ʔemúkʷ** *It is skinned*; **hi púxʷ** *It smells*; and **hecq̓ʷúẇ** *It's broken.*

b. Orthographic **o**

Plain schwa is represented as orthographic **o** in 'rounding' retracting environments, that is when immediately followed by a rounded uvular or pharyngeal consonant. Examples include: **hescóʕʷ** *It's fringed*; **hesčlóʕʷ** *It's hooked up*; **hesč'ɬsóʕʷ** *It's been strained (as through a strainer)*; **hesťóqʷ** *It is sewn together*; and **hecʕʷóx̣ʷ** *It's strung up.*

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[13] Gutturals are here understood as in Halle et. al. (2000) and include consonants with Tongue Root specifications corresponding to uvulars and pharyngeals or with Larynx specifications corresponding to the laryngeals /ʔh/. The feature [ATR] is also identified as a Tongue Root specification under the Guttural node.

[14] Regarding the retraction associated with rounded pharyngeals, it may be the case that orthographic **o** is better represented phonetically as the low back rounded vowel [ɒ].

c. Orthographic **i**

Plain schwa is represented as orthographic **i** in all other contexts (excluding those with a root-final unrounded guttural or with retracting roots). Examples include: **hesč'íc̓** *A long cylindrical object lies*; **x̌íl** *He's still*; **hecpín̓** *It's bent*; **p̓p̓íš** *It's a little bit scraped*; **hi šíx̌̓** *They're all lined up;* and **hi ʕʷíɬ** *It's all in one piece.*

Some additional generalizations regarding the relationship between /ə/ and rounded, retracting, and laryngeal consonants are in order.

While rounding spreads leftward within the root to an adjacent /ə/,[15] it does not spread rightward within the root. Leftward spread is evident in the examples under orthographic **u** and **o**. The prohibition against rightward spread of rounding within the root is demonstrated by the weak root √ʕʷəɬ *one piece* which displays the stressed vowel [i]: **hi ʕʷíɬ** *It's all in one piece.* Spokane provides additional support for this claim with the weak root √qʷəs which also displays the stressed vowel [i]: **hi qʷís** *It's lacey.* The only exception to this generalization is the weak root √q̓ʷəc *to be fat* which surfaces with stressed [u] across the dialect continuum: **kʷ q̓ʷq̓ʷúc** *You're a little fat.*[16]

Likewise, regressive retraction spreads leftward but not rightward within the root. The leftward spread of regressive retraction is evident in the examples presented above under orthographic **o**, all of which contain a root-final rounded uvular or pharyngeal. In the event that such a consonant precedes plain schwa, the vowel is not retracted. This is demonstrated by the forms **hi qʷís** *It's lacey*, **hecq̓ʷúẇ** *It's broken*, and **hi ʕʷíɬ** *It's all in one piece.*

The fact that progressive retraction has not applied in the form **hi ʕʷíɬ** *It's all in one piece* provides some insight into the constraints imposed on this type of assimilation. It highlights a distinction made in the grammar between the feature-sharing that results from the derivational process of spreading and that which results from the linking of like features that are underlyingly specified.

Consistent with the prohibition against rightward spread of rounding within the root, the rounded feature of the pharyngeal consonant of **ʕʷíɬ** has not spread from the pharyngeal to the stressed vowel. Significant, however, is the fact that the surface vowel of this form shows that progressive retraction has also not been triggered.

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[15] The weak root exceptions to the leftward spread of rounding noted in Black (1996) have been resolved as occurrences of root /ə/ and are discussed in section 3.2.2 below. Full vowels remain unaffected by the leftward spread of rounding within the root.

[16] Seeming exceptions to rightward spread within the root forms traditionally spelled as √q̓ʷum *piled up, stuffed* and √q̓ʷus *bunched, gathered, puckered* do not represent exceptions since each is likely associated with two different roots: strong √q̓ʷum glossed *piled up* and weak √q̓ʷəm (or perhaps √q̓ʷə̓m) glossed *stuffed*; strong √q̓ʷus glossed *wrinkled, puckered* and weak √q̓ʷəs (or perhaps √q̓ʷə̓s) glossed *bunched, gathered.*

Perhaps the reason retraction has not occurred in the form ʕʷíɬ hinges on the issue of rounding. In this case, the prohibition against rightward spread of the rounded feature within the root combined with the fact that the vowel is underlyingly unrounded prevents the application of progressive retraction. Evidently, this rightward retraction process requires that a pharyngeal's features link as a bundle; if the linking of one feature is blocked, so is the other.[17]

The facts surrounding the class of gutturals suggest some striking phonological preferences. The data provided above clearly indicate that rounded uvulars and plain schwa may occur within a single root. It is also the case that rounded uvulars may co-occur with retracted schwa. (Details on retracted schwa are presented in section 3.2.2 below.) Significantly, the language disfavors the root co-occurrence of unrounded uvulars and plain schwa. Instead, it prefers retracted schwa in such environments. Also notable is the fact that the same generalization holds for root laryngeals. The language again prefers retracted schwa in such environments.

Regarding weak roots with unrounded pharyngeals, the identity of the root vowel is not as clear cut. The data set includes six weak roots with a root-initial unrounded pharyngeal and four with a root-final unrounded pharyngeal; all display stressed **[ɑ]**. Since the retraction of an unrounded stressed vowel always results in **[ɑ]**, it is possible that the underlying vowel in these roots is either /ə/ or /ə̣/. Based on the clear preference expressed by the other unrounded gutturals (uvulars and laryngeals), it is likely that roots with unrounded pharyngeals, as well as retracting roots, also contain retracted schwa. Unrounded gutturals may then be viewed as a natural class with which plain schwa tends not to occur, the language instead preferring retracted schwa in such contexts.

### 3.2.2 Weak root retracted schwa: /ə̣/

Black (1996) claims that all weak roots contain only schwa, including those represented with orthographic **e**; however, feature-sharing with neighboring consonants cannot account for the phonetic realization of schwa as stressed **[ɛæ]** or **[e]** in such weak forms. In addition, feature-sharing cannot fully account for many weak root forms with stressed **[ɑ]** represented as orthographic **a**. The present analysis resolves these problems by positing /ə̣/ as the underlying vowel in such weak root forms and relying on the process of feature-filling to produce the requisite full vowels for forms with orthographic **e**. In retracting environments, feature-sharing is responsible for the surface forms of stressed /ə̣/ represented with orthographic **a**.

While the set of allophones of root plain schwa in stressed position coincides with those of the full vowels /iu/ and /o/, the allophonic variation

[17] In the event that a root-initial, rounded pharyngeal is followed by a rounded vowel, the phonology permits underlying feature-sharing and retraction occurs, as in the strong root form ʕʷósn *I lost it.*

associated with root retracted schwa in stressed position coincides with the full vowel /e/ in non-retracting environments, that is [ɛæ] or [e], and the full vowel /a/ in retracting environments, that is [a]. The conditioning environments for the allophones of retracted schwa can be identified with few exceptions. The environments are provided below and headed by the relevant orthographic symbol.

(26) a. Orthographic **e**

Retracted schwa is represented as orthographic **e** in all non-retracting environments. Examples include: **hi c̓eš** *He's bashful*; **hi q̓éxʷ** *He acts conceited*; **hecq̓éy̓** *It's written*; **sctéʔs** *This is what he pounded*; **tʔékʷ** *He came ashore*; and **hecx̣ʷtx̣ʷét** *It's cut in pieces of different sizes.*[18]

b. Orthographic **a**

Retracted schwa is represented as orthographic **a** in all retracting environments, that is: when followed by a non-adjacent uvular[19] as in **cálx̣ʷ** *It's clustered*, **hecp̓áčq̓ʷ** *It was stripped off*, and **hecp̓áy̓q** *It's ripe;* when immediately followed by a rounded or unrounded uvular as in **cllálx̣ʷx̣ʷ** *It suddenly bunched up*,[20] **hi ɬáq̓ʷ** *It's plain to see*, **hescáq** *It's placed*, and **hesc̓w̓áq** *It pulls out*; when immediately followed by a rounded or unrounded pharyngeal as in **ƛ̓aʕʷč'** *muddy*[21] and **hi yáʕ** *It's gathered*; when immediately preceded by an unrounded pharyngeal as in **hecʕác** *It's tied* and **hecʕáƚ** *There's a barrier around it*; and when targeted by a floating

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[18] Spokane's weak root √yər *round* does not represent an exception to this generalization; despite the fact that it typically receives the orthographic representation yir, its phonetic realization is probably best transcribed as [yᵊer]. Also, forms gathered as occurrences of √x̣al] *light, clear* are not exceptions since they are likely based on two different roots, one strong with /a/ glossed *clear, light* and one weak with /ə/ glossed *day*.

[19] The root form traditionally spelled as √milq̓ʷ *ball-like, balled up* does not represent an exception since it is likely associated with two different roots, one strong with /i/ glossed *round in shape* and one weak with /ə/ (or perhaps /ə̓/) glossed *rolled up into a ball*.

[20] The root of this form (and the form cálx̣ʷ *It's clustered* provided above) is √cəlax̣ʷ. The source for the word is Carlson and Bates (1990).

[21] Vogt (1940a) and Egesdal (1993) indicate that this root does not contain a rounded pharyngeal in Kalispel and Seliš. While Spokane maintains the root form √ƛ̓əʕʷč', the other dialects have innovated to retain the rounded feature as /w/ and the pharyngeal as a floating pharyngeal feature in the root √ƛ̓əwč'. The surface vowel remains [a] which is not surprising since this weak root is a retracting root.

pharyngeal feature as in **hi ćán** *It's on tight* and **hecṗáť** *It's muddy.*[22]

Some observations regarding the relationship between /ə̣/ and rounded, retracting, and laryngeal consonants are also in order.

While the data indicate that retracted schwa co-occurs with consonants of all manner and place, it most frequently co-occurs with gutturals (uvulars, pharyngeals, and laryngeals). Interestingly, the language shows a clear preference that weak roots with unrounded uvulars and laryngeals contain retracted schwa to the exclusion of plain schwa. Given this fact, it seems reasonable to extend this constraint to include unrounded pharyngeals and retracting roots; that is, roots with unrounded gutturals and retracting roots contain retracted schwa.

Most striking, perhaps, are the forms with rounded consonants. In the examples with rounded consonants, there is no rightward spread of rounding to an adjacent retracted schwa within the root. This is consistent with the pattern exhibited by weak roots with plain schwa. Examples include **hecx̣ʷtx̣ʷét** *It's cut in pieces of different sizes* and **hecćẇáq** *It pulls out.* Unlike the weak roots with plain schwa, however, when a rounded consonant immediately follows retracted schwa, rounding does not spread leftward within the root; examples include **hi ɬáq̣ʷ** *It's plain to see*, **hi q̣éxʷ** *He acts conceited*, **t̓ʔék̓ʷ** *He came ashore*, **x̓aʕʷč'** *muddy*, and **cllax̣ʷx̣ʷ** *It suddenly bunched up.*

The data indicate that the regressive retraction associated with uvulars and pharyngeals spreads leftward within the root, even from rounded consonants whose rounding has not spread, and results in root /ə̣/ surfacing as stressed [ɑ] : **hescáq** *It's placed*, **hi yáʕ** *It's gathered*, **x̓aʕʷč'** *muddy*, and **hi ɬáq̣ʷ** *It's plain to see.* This suggests that regressive retraction applies within fewer constraints than progressive retraction.

The data also indicate that the progressive retraction associated with root-initial unrounded pharyngeals[23] spreads rightward within the root to an adjacent root/ə̣/. Consequently, the surface value of the stressed vowel is [ɑ] as in **hecʕác** *It's tied.* Regarding the effects of retraction triggered by retracting

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[22] There are a small number of retracting roots which no longer participate in progressive retraction: for example, **yáćmstén** *I tightened it* which displays stressed [ɛ] instead of [ɑ]. Despite the fact that the floating pharyngeal feature of such weak roots no longer participates in long distance retraction (that is, rightward beyond the root), it continues to retract vowels within the root domain. This is demonstrated by the fact that such root vowels still undergo retraction as in **hi yáć** *It's stuck tight.*

[23] While the data set lacks even one example of a root-initial rounded pharyngeal followed by root /ə̣/, it seems reasonable to assume that this simply represents a gap in the data and not a prohibition against the co-occurrence. Carlson (1972) identifies both rounded and unrounded pharyngeals as marginal phonemes, a claim that offers a possible explanation for such a gap. In the event that such a form exists, however, the anticipated stressed value of root /ə̣/ is [ɛæ] or [e], and not [ɑ]. Recall that rounding does not spread in this context and, since the vowel is unrounded, neither does retraction.

roots, root /ə/again surfaces with the stressed value [ɑ] as in hi c̓án *It's on tight.*

As expected, progressive retraction is not triggered by uvulars; in such cases the stressed vowel surfaces as [ɛæ] or [e] as in hecq̓éy̓ *It's written* and hecx̣ʷtx̣ʷét *It's cut in pieces of different sizes.* In the event that root /ə/ is adjacent to an underlying laryngeal, its stressed value is also [ɛæ] or [e] as in scté?s *This is what he pounded.* There are two exceptions to these generalizations: the weak root forms hi x̣ám̓ *It's dry* and hec?úxʷ *It hangs down.*[24]

Forms which illustrate the dialect differences associated with /r/ and /l/ also highlight the patterns of retracted schwa. The Spokane and Kalispel/Seliš forms provided in Table 6 serve as examples.

While the Spokane dialect makes use of phonemic /r̓r̓/ and /l̓l̓/, the other dialects use only phonemic /l̓l̓/. Spokane roots ending in orthographic **er** and **er̓** show a regular correspondence to Kalispel and Seliš roots ending in orthographic **al** and **al̓**. Vogt (1940a) and Giorda (1877-79) transcribe the root-final consonants as plain **l** [l], but Egesdal (1993) transcribes these allophones as **ɬ** [ɬ], the 'dark' alveolar lateral. Egesdal's study also describes this allophone as a retracting consonant.[25] Spokane /r/, however, is not a retracting consonant.[26]

The cross-dialectal facts associated with the vowels of weak roots with the r/l correspondence are entirely consistent with the allophonic variation presented above; that is, stressed root /ə/ is realized as [ɛæ] or [e] in the Spokane non-retracting environments and as [ɑ] in the retracting environments of the other dialects.

**Table 6:** Orthographic **r** and **l** cross-dialect correspondences for three weak roots with stressed root vowels.

| | Spokane orthography | Kalispel and Seliš orthography |
|---|---|---|
| (27) | a. **hesč'ér**<br>It's cut. | b. **ʔesč'ál**<br>It's cut in strings.[27] |

[24] Another possible exception involves the weak root √q̓ə́c̓ *braided, woven.* The stressed root vowel surfaces as [i] in Spokane but as expected [e] in all other dialects.

[25] Egesdal (1993) suggests that this consonant may be (or may have been) a "pharyngealized" consonant. The stressed values of epenthetic schwa-class vowels provide clear evidence that this consonant is not pharyngealized. Epenthetic vowels display the effects of progressive retraction only in the context of a retracting root or a root final pharyngeal, surfacing as [ɑ] in a 'non-rounding' context. When inserted after the [ɬ] of a non-retracting root, however, the epenthetic vowel surfaces as [ɛ] or [i], but never as [ɑ].

[26] Forms based on the strong roots √c̓ur *salty* and √šer *boredom, laziness* illustrate this fact: hi c̓úr *It's salty* and čn šérr *I got bored.*

[27] The form is taken from Giorda (1877-79); its orthography has been standardized.

| | | |
|---|---|---|
| (28) | a. **hestér**<br>It's untied. | b. **čn ʔestál**<br>I am loose.[28] |
| (29) | a. **hecyérkʷ**<br>It's bent. | b. **ʔesyálkʷ**<br>It's bent. |

### 3.2.3 Minimal weak root pairs: /əə̣/

The availability of both plain and retracted schwa allows for the occurrence of minimal weak root pairs. In the set of weak roots lacking unrounded gutturals, it is possible that pairs of these roots differ only with respect to their vowels. The data set includes at least one pair of examples provided in Table 7. The weak root with plain schwa √t̓əkʷ *lie down* surfaces with the anticipated stressed vowel **[u]** as in example (30a). The weak root with retracted schwa √t̓ə̣kʷ *emerge* surfaces with the anticipated stressed vowel **[ɛ]** as in example (30b).

**Table 7:** Minimal weak root pairs

| Weak root with /ə/ | Weak root with /ə̣/ |
|---|---|
| (30) a. **t̓t̓úkʷ**<br>A little thing lies down. | b. **t̓t̓ʔékʷ**<br>A small thing emerged. |

## 3.3 Epenthetic /əə̣/

The phonetic realizations of stressed epenthetic /əə̣/ are consistent with those of weak root /əə̣/; that is, the allophones of plain schwa include **[iu]** or **[ɔ]**[29] represented orthographically as **iu** or **o**, and those of retracted schwa include **[ɛæ]** or **[e]** as well as **[ɑ]** represented orthographically as **e** and **a**.

Similar to the restrictions placed on plain schwa in weak roots, epenthetic /ə/ displays a pattern in which it is never selected for epenthesis in those contexts that include a root-final unrounded guttural. Epenthetic /ə̣/ also shows a limited distribution, unlike its weak root counterpart, in that it is only selected in those contexts that include a root-final unrounded guttural. The epenthetic schwa vowels are, therefore, in complementary distribution with respect to root-final gutturals, but in a non-guttural context, plain schwa is the preferred vowel of epenthesis.

[28] The form is also taken from Giorda (1877-79); again, the orthography has been standardized.

[29] Regarding the retraction associated with rounded pharyngeals, it may be the case that orthographic **o** is better represented phonetically as the low back rounded vowel **[ɒ]**.

### 3.3.1 Epenthetic plain schwa: /ə/

The conditioning environments for the allophones of stressed epenthetic /ə/ can be identified with few exceptions. They are presented below and headed by the relevant orthographic symbol:

(31) a. Orthographic **u**

Epenthetic plain schwa is represented as orthographic **u** when immediately preceded by a rounded velar or uvular consonant. Examples include: **ckʷúm** *He pulled*; **čn lq̓ʷúm** *I broke up something*; **p̓wúp** *It* echoed; **pχ̣ʷúm** *He distributed something*; and **ʕawúp** *It melted.*

b. Orthographic **o**

Epenthetic plain schwa is represented as orthographic **o** when immediately preceded by a rounded pharyngeal as in **lʕʷóm** *He put them together* and **lʕʷóp** *It fits together.*

c. Orthographic **i**

Epenthetic plain schwa is represented as orthographic **i** in all other contexts (excluding those with a root-final unrounded guttural or with retracting roots). Examples include: **shemíp** *fog*; **čn ɬp̓ím** *I marked something*; **ƛ̓líp** *It stopped*; **p̓ším** *He scraped something*, and **ʕay̓íp** *He went fast.*

The forms with orthographic **u** and **o** indicate that all rounded consonants spread rounding rightward beyond the root to an adjacent plain schwa.[30] Recall that the facts pertaining to weak root vowels demonstrate that rounding spreads leftward within the root to the adjacent weak root vowel but not rightward within the root.

Forms from among those examples with orthographic **u** indicate that uvular consonants do not retract an adjacent plain schwa rightward beyond the root: **čn lq̓ʷúm** *I broke up something* and **pχ̣ʷúm** *He distributed something.* This is consistent with the process of regressive retraction; that is, it applies leftward.

Forms with orthographic **o** indicate that, since rounding is permitted to spread from a rounded pharyngeal rightward beyond the root, progressive retraction is also permitted to apply rightward beyond the root to an adjacent plain schwa.

Again, the facts surrounding gutturals suggest some striking phonological preferences. Similar to the patterns displayed by the vowels of weak roots, the phonology disfavors epenthetic plain schwa in the environment of a root-final, unrounded guttural and in the environment of a retracting root.

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[30] Full vowels remain unaffected by the rightward spread of rounding beyond the root.

Instead, it selects retracted schwa in such environments (see section 3.3.2 below). Unlike the patterns displayed by weak root vowels, however, the data clearly indicate that plain schwa is selected for epenthesis in all other contexts to the exclusion of retracted schwa.

### 3.3.2 Epenthetic retracted schwa: /ə̣/

The conditioning environments for the allophones of stressed epenthetic /ə̣/ can be identified with few exceptions. They are presented below and headed by the relevant orthographic symbol:

(32) a. Orthographic **e**

Epenthetic retracted schwa is represented as orthographic **e**: when immediately preceded by a root-final unrounded uvular as in **tqém** *He touched it* and **č'ɬpaʔχém** *He thought intelligently*; and when immediately preceded by a root-final laryngeal as in **ƛ̓ʔém** *He looked for something* and **yeʔckʷʔém** *I am biting it.*

b. Orthographic **a**

Epenthetic retracted schwa is represented as orthographic **a**: when immediately preceded by a root-final unrounded pharyngeal as in **ṗʕáp** *It burned*, **nyʕáp** *It's forever*, and **čn q̇ʷʕáp** *I slipped*; and when targeted by a floating pharyngeal feature as in **čn ṗt̓ám** *I poured a gravy like substance* and **snáp** *She became engrossed.*

The data indicate that retracted schwa is selected for epenthesis in the environment of root-final unrounded gutturals and retracting roots to the exclusion of plain schwa.[31] In the contexts of unrounded uvulars and laryngeals, its stressed value is **[ɛæ]** or **[e]** represented as orthographic **e**. The only exception to this generalization is the Kalispel form **yesq̇aχ̣ím** *I am building a road* (Vogt 1940a).

Forms from among those examples with orthographic **e** demonstrate that uvular consonants do not retract an adjacent retracted schwa rightward beyond the root: **tqém** *He touched it.* Again, this is consistent with the process of regressive retraction; that is, it applies leftward.

In the retracting contexts of unrounded pharyngeals and retracting roots, the stressed value of retracted schwa is **[ɑ]** represented as orthographic **a**: **čn q̇ʷʕáp** *I slipped* and **snáp** *She became engrossed.* This is consistent with the process of progressive retraction; that is, it applies rightward.

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[31] Laryngeals must be present underlyingly and not the result of infixation or consonant vocalization.

### 3.3.3 Cross-dialect /r/ and /l/ facts

A comparison of the forms with /r/ and /l/ correspondences reveals some surprising surface forms provided in Table 8.

Regarding Spokane's /r/ forms, since /r/ is not a retracting consonant, the predicted epenthetic vowel is plain schwa with an anticipated stressed value of [i]. In fact, this is the vowel that most often surfaces, but not exclusively. The data set of confirmed weak roots with final /r/ is small, comprising only eight roots. Of these eight, the quality of the epenthetic vowel is available for five roots. Of these five, the form based on the root √yər *round* in (37a) displays the unexpected stressed value [ɛ] for the epenthetic vowel, the value predicted for retracted schwa. I have no explanation for the appearance of this allophone.

Regarding the corresponding /l/ forms in the other dialects, since the allophone of /l/ that occurs in those roots is the 'dark' consonant ɬ [ɬ] (one that the data indicate retracts the root vowel to [ɑ]), it is reasonable to assume that these roots pattern with the requirements for root-final unrounded uvulars and laryngeals. In that case, the predicted epenthetic vowel is retracted schwa with an anticipated stressed value of [ɛæ] or [e]. Interestingly, only one form conforms to this prediction, the form based on the root √yəl *round*. All other realizations of the epenthetic vowel are [i], the value predicted for plain schwa.

A reasonable explanation for the occurrence of the [i] allophone in the Kalispel and Seliš forms may be the fact that the 'dark' consonant ɬ [ɬ] does not possess the distinctive guttural feature [+RTR] underlyingly. It is most likely the case that the consonant ɬ [ɬ] was never phonemicized and remains a "positional variant" of /l/ after retracted schwa.[32] Lacking underlying [+RTR], the phonology may simply view it as a non-guttural and select plain schwa.[33] If this analysis is correct, this leaves no cogent explanation for the form based on the root √yəl that appears in (37b). Notable is the fact that this same root also proved exceptional in the Spokane form of (37a).

[32] Kuipers (1981).

[33] Interestingly, the phonological process of regressive retraction seems unconcerned with the underlying or derived source of this consonant's retracting feature, as is demonstrated by the fact that the root vowel surfaces as [ɑ] in the forms provided in Table 6.

**Table 8:** Orthographic **r** and **l** cross-dialect correspondences for five weak roots with stressed epenthetic vowels.

| | Spokane orthography | Kalispel and Seliš orthography |
|---|---|---|
| (33) | a. **č'ríp**<br>He swam. | b. **č'alíp**<br>He swam. |
| (34) | a. **č'ɬtríp**<br>It became untied. | b. **čn talíp**<br>I am loose.[34] |
| (35) | a. **ʔuríp**<br>It burned. | b. **ʔulíp**<br>It burned. |
| (36) | a. **xʷríp**<br>It shook. | b. **xʷalíp**<br>It shook. |
| (37) | a. **čyrém**<br>He wrapped it around s.t. | b. **čyalém**<br>He wrapped it around s.t. |

Forms based on the root √**x̣ə̣l** *long objects are laid next to one another* provided in Table 9 deserve special comment. This root is unusual in that it represents one of the few weak roots with retracted schwa which does not display the Spokane change from /l/ to /r/.[35] Unlike the forms in (27a-29a) and (33a-37a), Spokane maintains the final **l** consonant in this weak root. The absence of change is consistent with the fact that Spokane disfavored such an adjustment for roots in which the dark **ɬ** consonant **[ɬ]** co-occurs with a root-initial uvular. While the synchronic quality of the final **l** consonant of Kalispel and Seliš likely matches the dark **ɬ** of the forms above, the status of the Spokane allophone as plain or dark has not been clarified in the literature.

The forms provided in Table 9 illustrate the stressed values of root and epenthetic vowels for both the /r/ and /l/ dialects. The forms in (38a-b) both lack suffixes; consequently, stress is assigned to the root vowel. This vowel surfaces as stressed **[ɛ]** in Spokane and **[ɑ]** in the other dialects, values entirely consistent with underlying retracted schwa if the Spokane /l/ is non-retracting and Kalispel/Seliš /l/ is retracting.

Interestingly, the forms with suffixes show an unexpected outcome. Example (39a) indicates that the Spokane phonology selects and epenthesizes retracted schwa which surfaces as **[ɛ]**, the vowel anticipated in forms with a root-final unrounded guttural. This is similar to the facts associated with the Spokane root √**yə̣r** in (37a) above. Conversely, the Kalispel/Seliš form

[34] The form is taken from Giorda (1877-79); again, the orthography has been standardized.

[35] The present analysis follows Kuipers (1981) and views /r/ as an innovation. It is here assumed that Spokane /r/ developed from a positional variant of /l/.

presented in (39b) indicates that the other dialects select and epenthesize plain schwa which surfaces as [i], an outcome that matches the majority of dark ḷ facts presented above.

**Table 9:** Orthographic l and ḷ cross-dialect correspondences for one weak root.

| | Spokane orthography | Kalispel and Seliš orthography[36] |
|---|---|---|
| (38) | a. **hecx̣él**<br>They're laid next to each other. | b. **esx̣ál**<br>It is covered with planks. |
| (39) | a. **x̣lém**<br>He built a cover. | b. **čn x̣alím**<br>I cover s.t. with planks. |

### 3.4 Weak suffix /əə̣/

Black (1996) specifies a set of weak suffixes that contain vowels which are valued by the phonology as /ə/ but do not necessarily follow the allophonic variation described for weak root stressed /ə/ in non-retracting environments. The vowels in these suffixes were then labeled schwa-class vowels and a determination of the features which distinguish among them left to future research. The stressed vowels displayed by these weak suffixes are [iɛ] and [u] in non-retracting environments.

The only context that can possibly alter the quality of these stressed suffixal vowels is one based on a retracting root, that is a root that contains a floating pharyngeal feature which instigates long distance progressive retraction. In such an environment, forms with corresponding [i] and [ɛ] display [ɑ]. The data set lacks examples confirming the quality of the stressed vowel in the environment of a retracting root for suffixes with corresponding [u].

Three weak suffixes surface with stressed [i], the allophone predicted for /ə/ in such environments. The other weak suffixes display stressed [ɛ] or [u], an outcome that is inconsistent for those environments if the underlying vowel is /ə/. On the other hand, if the underlying vowel of those forms surfacing with stressed [ɛ] is analyzed as /ə̣/, an additional five of these weak suffixes prove to be entirely regular. An explanation for the stressed vowel quality [u] of the two remaining weak suffixes is still unavailable.

#### 3.4.1 Weak suffix plain schwa: /ə/

In non-retracting environments, three suffixes surface with stressed [i] represented as orthographic i. In the context of a retracting root, the quality of the stressed vowel is [ɑ] represented as orthographic a. These outcomes are

[36] These forms are taken from Giorda (1877-79); again, the orthography has been standardized.

entirely consistent with the underlying presence of plain schwa. The suffixes include: /-mə/ *Nonperfective*, /-sə-/ *2nd Sg Transitive Object* for -nt- stems, and /-šə-/ *Redirective*.

(40) a. Orthographic **i**

Examples include: **hechmpmí** *It's getting foggy*; **tqncín** *I hit you (sg)*;[37] and **čn̓šítn** *I helped him.*

b. Orthographic **a**

Examples include: **hecpspmá** *He is standing wide-eyed and staring* and **t̓mncán**[38] *I licked you.* The data set lacks examples for the suffix /-šə/ *Redirective.*

### 3.4.2 Weak suffix retracted schwa: /ə̓/

In non-retracting environments, five suffixes surface with stressed [ɛ] represented as orthographic **e**. In the context of a retracting root, the quality of the stressed vowel is [ɑ] represented as orthographic **a**. These outcomes are entirely consistent with the presence of retracted schwa. The suffixes include: /-ə̓m/ *Passive*[39], /-ə̓n/ *1st Sg Transitive Subject*, /-ə̓xʷ/ *2nd Sg Transitive Subject*, /-ə̓s/ *3rd Sg/Pl Transitive Subject*, and /-ə̓p/ *2nd Pl Transitive Subject.*

(41) a. Orthographic **e**

Examples include: **lq̓ntém** *It was peeled*; **c̓lc̓lntén** *I stood them up*; **ɬq̓ʷmstéxʷ** *You made it come into view*; **x̌q̓ntés** *He poked it*; and **wi?stép** *You (pl) finished it.*

b. Orthographic **a**

Examples include: **t̓m̓ntám** *He was licked*, **ptntán** *I boiled it*, **t̓m̓ɬtáxʷ** *You licked her foot*, **np̓t̓ntás** *He poured a gravy-like substance into that container*, and **t̓mntáp**[40] *You (pl) licked it.*

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[37] The underlying morpheme segmentation for this word is /tə̓q-n-t-sə-ə̓n/. In this and similar forms, primary stress has been assigned to plain schwa; nevertheless, stress assignment is unconcerned with the quality of the schwa-class vowel. In the absence of a full vowel, it is the leftmost schwa-class vowel in the suffixal domain that is deemed optimal with respect to primary stress, regardless of its identity as plain or retracted schwa.

[38] This form is taken from Vogt (1940a) which provided no translation; the orthography has been standardized and a reasonable gloss included.

[39] Also used in forms that refer to a first person plural subject and a third person object.

[40] This form is also taken from Vogt (1940a) which provided no translation; again, the orthography has been standardized and a reasonable gloss included.

### 3.4.3 Weak suffix schwa-class vowel to be determined

In non-retracting environments, two suffixes surface with stressed [u] represented as orthographic **u**, an outcome that still requires an explanation. These suffixes include: [-ɬul-] *1st/2nd Pl Transitive Object*[41] and [-um-] *2nd Sg/Pl Transitive Object* for -st- stems.

It is probable that the underlying vowel of these suffixes is plain schwa, the stressed value [u] resulting from the influence of a consonantal feature. The consonants /ɬ/ and /m/, however, lack the feature [+round], a claim that is confirmed by the fact that post-vocalic /ɬ/ and /m/ in weak roots do not spread rounding. It may be the case that the rounded quality of the stressed vowel signals the presence of a 'floating round' feature that has remained after the loss of a rounded consonant. The final explanation may then rely on the diachronic analysis of these suffixes.

(42) a. Orthographic **u**

Examples include: **qeʔ c̓x̣ʷc̓x̣ʷɬúllt** *You laid down the law to us* and **wiʔstúmn** *I stopped you.*

b. Speculative Orthographic **o**

A gap in the data set has resulted in an absence of examples of these suffixes in the context of a retracting root; nevertheless, the anticipated stressed value of these suffixal vowels within such a context is [ɔ] (or perhaps [ɒ]) represented as orthographic **o**.

## 4 The development of the of /əə̓/ patterns

Kuipers (2002) contends that *ə̓ *a̓ may not have been distinct in Proto-Salish and further that *ə *ə̓ of Interior Salish developed into **é á** in Shuswap, Kalispel, Spokane, and Coeur d'Alene. The /əə̓/ patterns of Spokane-Kalispel-Seliš suggest instead that Proto-Salish *ə̓ *a̓ were, in fact, distinct and that *ə *ə̓ maintain their phonemic distinction as /əə̓/ in at least one language of Interior-Salish, that is Spokane-Kalispel-Seliš.

It is not difficult to imagine possible stages of development that led from a phonological system that allowed /əə̓/ to surface as allophones very similar to their underlying representations to a system that requires these phonemes to take on the characteristics of the allophones of full vowels. The early realization of plain schwa may have been quite close to the close-mid central unrounded vowel [ɘ] and that of retracted schwa close to the open-mid central unrounded vowel [ɜ]. Given their targetless quality, however, their

[41] This Plural marker co-occurs with other markers that may help clarify its interpretation as 1st or 2nd person.

precise phonetic realizations were likely influenced even then by neighboring consonants.

Perhaps primary stress assignment served as the impetus to move from a simple coloring process to an assimilation process so complete that it neutralized the phonetic distinction between full and schwa-class vowels. Proto-Salish's preference to assign primary stress to full vowels over schwa-class vowels[42] is probably a natural consequence of their lack of oral place features. The phonology may have viewed them as deficient vowels, unsuitable to serve as a syllable head and, thus, poor candidates for attracting primary stress. In the event that a full vowel was unavailable for stress placement, however, the phonology settled for plain or retracted schwa, over time imposing some feature conditions on each of them.

For the purpose of primary stress assignment, the phonology may have required /əə̣/ to assume certain characteristics of full vowels; that is, by feature-sharing and feature-filling, they were able to surface in stressed position as allophones similar to those of full vowels. Coupled with the features that were shared and filled, the guttural feature [ATR] no doubt contributed significantly to the resulting allophonic patterns. In non-retracting environments, it is possible that plain schwa with [+ATR] adopted the features of neighboring consonants, surfacing in the range of **[i]** (an allophone of /i/) or **[u]** (an allophone of /u/), while retracted schwa with [-ATR] gravitated toward **[a]** (an allophone of /a/). In 'rounding' retracting environments, plain schwa may have surfaced as **[ʊoɔ]** or **[ɒ]** (allophones of /u̯/); retracted schwa may have surfaced as **[ɑ]** (an allophone of /a̯/) in both 'rounding' and 'non-rounding' retracting environments.[43]

Subsequent to the imposition of such requirements on /əə̣/, changes in the grammar continued to amass. Within Interior-Salish, dialects carved out their unique paths, eventually emerging as languages. Even as additional changes in the phonology accumulated and contributed to the emergence of the Spokane-Kalispel-Seliš language, phonemic /əə̣/ and their chameleon allophones persisted in this language.

Within Spokane-Kalispel-Seliš, the allophones of plain schwa may have experienced little if any change, but the allophone(s) of retracted schwa experienced significant adjustment. As phonemic /a/ and its allophones raised to become phonemic /e/, the constraint that determined the features of retracted schwa in stressed position followed the path taken by /a/ and adjusted the specifications for the allophones of retracted schwa accordingly. Significantly, any changes relative to the feature specifications of /əə̣/ constituted only phonetic, not phonemic, changes, a characteristic of the phonology that still remains.

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[42] Thompson (1979).

[43] Speculations on the phonetic quality of /əə̣/ assume the limited distribution pattern described for Spokane-Kalispel-Seliš; that is, plain schwa is disfavored in the environment of unrounded gutturals.

## 5 Conclusions

Data from across the Spokane-Kalispel-Seliš dialect continuum support the claim that the strong/weak root distinction relies on the phonemic opposition between the full vowels /ieuoa/ and the schwa-class vowels /əə̣/ in order to assign primary stress. These data also indicate that the phonology imposes requirements on the phonetic realization of the phonemes /əə̣/ which produce regular allophonic patterns that mimic those of full vowels. Additionally, distribution patterns indicate that the phonology disfavors the occurrence of plain schwa in the environment of unrounded gutturals, preferring retracted schwa instead.

The presence of /əə̣/ in the phonemic inventory of Spokane-Kalispel-Seliš has relevance for diachronic studies in that the facts associated with the /əə̣/ patterns may prove highly significant in efforts to reconstruct forms of the proto-languages. While Moses-Columbia is often cited as "the more conservative language phonologically,"[44] Spokane-Kalispel-Seliš may serve as an additional 'conservative' resource.

Under the present analysis, the schwa-class vowels of many weak root forms of Spokane-Kalispel-Seliš show a regular correspondence to those reconstructed for Proto-Salish and Proto-Interior-Salish in Kuipers (2002). Perhaps more significantly, however, many other weak root vowels proposed for Spokane-Kalispel-Seliš contradict those presented in Kuipers (2002); where the weak root forms of Spokane-Kalispel-Seliš display the plain or retracted schwa pattern, the reconstructed forms often include a full vowel or plain schwa.[45] Particularly notable is the under-representation of retracted schwa in the proto-forms.

Given the phonemic status of schwa-class vowels in Spokane-Kalispel-Seliš, the /əə̣/ patterns may serve as a baseline for assessing and/or identifying vowels reconstructed for weak roots and suffixes. These patterns may also play a role in determining the evolution of the vowel systems in other Salishan languages of the Interior. Additionally, the /əə̣/ patterns of Spokane-Kalispel-Seliš have much to contribute to the discussion of schwa within phonological theory.

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[44] Kinkade and Sloat (1972).

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