WHAT DETERMINES STRESS IN SḴWX̱WÚ7MESH (SQUAMISH)?*

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0. INTRODUCTION

The goal of this paper is outline what determines stress in Sḵwx̱wú7mesh. Our basic claim is that stress is determined by three factors: (1) position (2) the lexicon (3) vowel features. Using an Optimality Theoretic framework (OT) we argue that the Sḵwx̱wú7mesh stress assignment pattern can be captured via the interaction of **stress assignment constraints** (McCarthy and Prince 1993), **prosodic affix faithfulness constraints** (Alderete 1997) and **peak prominence constraints** (Kenstowicz 1996). This paper will contribute to the literature on Sḵwx̱wú7mesh stress patterns (Davis (1984), Demers and Horn (1978) and Kuipers (1967)), by contributing new data and examining the generalizations in an OT framework.

We begin our discussion with an overview of the relevant properties of the Sḵwx̱wú7mesh language. In Section 2 we provide a descriptive look at Sḵwx̱wú7mesh stress assignment in bisyllabic roots by introducing the relevant data that reveal the basic stress pattern in the language. In Section 3, we incorporate these generalizations into an OT framework and demonstrate that a particular metrical structure can capture the Sḵwx̱wú7mesh facts. Looking beyond simplex forms, in Section 4 we present some morphologically complex forms and outline three types of lexical suffixes that interact with stress assignment; we then incorporate the two prosodic affix faithfulness constraints into the ranking. With a closer examination of vowel quality, in Section 5 we identify the vowel place specification that will be assumed for the inputs; we incorporate both feature faithfulness constraints and peak prominence constraints into the established constraint hierarchy. Using Kenstowicz's (1996) analysis of quality-sensitive stress, we demonstrate that Sḵwx̱wú7mesh provides further evidence for the necessity of sonority driven constraints. We conclude our discussion in Section 6 and provide an outline for further research.

1. RELEVANT PROPERTIES OF THE SḴWX̱WÚ7MESH LANGUAGE[1]

1.1. Consonant Inventory

Sḵwx̱wú7mesh has a total of 30 consonants in its phonemic inventory. The chart in (1) below categorizes the phonemes by place and manner features:

*Sḵwx̱wú7mesh is a Coast Salish language spoken in the Burrard Inlet and Howe Sound area around Vancouver. There are fewer than twenty native speakers left, the youngest in his late sixties. We would like to thank the Squamish elders for their patience and invaluable insights. Unless otherwise noted, the data presented in this paper stems from preliminary fieldwork; forms were transcribed to the best of our abilities and we apologize to both the Squamish community and to readers for any mistakes. The analysis presented in this paper stems from Watt (1998a) and Bar-el (1998). We would like to thank Laura Downing, Peter Jacobs, Doug Pulleyblank, Kimary Shahin and Suzanne Urbanczyk for many hours of helpful discussion. We would also like to thank Henry Davis, Hamida Demirdache and the Squamish Nation for helping to make this research possible. Fieldwork for this research was funded by SSHRCC grant #410-95-1519. All mistakes are the authors' responsibility.

[1] All Sḵwx̱wú7mesh data in this paper that are shown in square brackets are presented in the International Phonetic Alphabet (IPA); all data in arrow brackets are presented in the orthography used by the Squamish community (see Appendix for a key to this orthography).

(1)

	Labial	Dental	Palatal	Lateral	Velar	Uvular	Glottal
Stops	p	t, ts	tʃ		k	q	ʔ
Ejective Stops	p'	t', ts'	tʃ'	tl'	k'	q'	
Labialized Stops					kʷ	qʷ	
Labialized Ejective Stops					k'ʷ	q'ʷ	
Nasals	m	n					
Fricatives		s	ʃ	ɬ		χ	
Labialized Fricatives					xʷ	χʷ	
Glides			j		w		h

(Kuipers 1967;p.22[2])

It is clear from the chart in (1) above that the variety of stops are distinguished through labialization and glottalization. Unlike all other stops, the ejective lateral stop [tl'] does not have an unglottalized counterpart. Furthermore, the labial uvular fricative [χʷ] has a non-labial counterpart; whereas the labial velar fricative [xʷ] does not. As is shown below, the Sḵwx̱wú7mesh vowel inventory is not as clear cut as its consonant inventory.

1.2. Vowel Inventory

Kuipers (1967) describes the Sḵwx̱wú7mesh vowel system as one that contains three full vowels and a schwa; he claims that "the presence or absence of schwa is to a large extent predictable if the morphological structure if the word is given" (1967:22). Consequently, he would probably present the underlying vowel inventory as follows:

(2) i u

a

Other Salishanists have claimed that schwa is not part of the vowel inventories of various Salish languages. Czaykowska-Higgins (1993), for example, identifies the same three-way contrastive vowel system for Nxa'amxcin (Moses-Columbia Salish) as underlying and claims that schwa is not an underlying vowel since its position and surface form is completely predictable. Within a framework of cyclic stress assignment, she further argues that the difference in stress assignment between roots with full vowels (strong roots) and roots with schwa (weak roots) derives from the fact that the full vowels are present underlyingly while schwa is not. Following Kuipers (1967), we assume that schwa is predictable in Sḵwx̱wú7mesh and thus is not part of the vowel inventory (see Section 5 for a detailed discussion of underlying Sḵwx̱wú7mesh vowels).

1.3. Acoustic Correlates of Stress

The acoustic correlates of stress in Sḵwx̱wú7mesh pitch and length. A preliminary look at sound waves seem to indicate that vowels with primary stress have the highest pitch, vowels carrying secondary stress have the second highest pitch and stressless vowels have the lowest pitch. We leave this issue to further research.

1.4. Stressed and Unstressed Vowel Systems:

Sḵwx̱wú7mesh surface vowels have been observed to fall into two sets: stressed and unstressed[3]. These two sets are given below (note that the positions of these vowels is based on Ladefoged's (1993) cardinal vowel chart[4]):

[2]This chart is based on Kuipers's discussion of the Sḵwx̱wú7mesh consonants; for expository purposes, we have presented a simplified version of the consonant inventory and converted all characters to their IPA counterparts.
[3]The reader is referred to Kuipers (1967) for other documented phonetic vowel realizations.

(3a) stressed

e o
ə
ɛ ɔ
a

(3b) unstressed

i u
e o
ə
ɔ[5]
a

The pattern shown in (3) above suggests that S<u>k</u>wxwú7mesh loses its high vowels in stressed position. Cross-linguistically, the pattern tends to be the opposite as observed by Mascaró (1978) for Catalan; Mascaró explains that in Catalan, the vowel system undergoes neutralization for the *unstressed* vowels (whereby seven vowels surface in stressed position while only three vowels surface in unstressed position). Given these characteristics of the S<u>k</u>wxwú7mesh vowels, the next section presents the relevant data which reveal the basic stress pattern.

2. BASIC STRESS PATTERN: THE GENERALIZATIONS

2.1. Stress patterns in bisyllabic roots

The basic stress assignment pattern in S<u>k</u>wxwú7mesh is revealed through an examination of three types of bisyllabic roots: (1) roots containing full vowels in their initial syllable (2) roots containing schwa in their initial syllables and a full vowel in their second syllable and (3) roots containing schwa in both syllables. In the following three subsections, the relevant data is introduced and the basic stress pattern is discussed.

2.1.1. Roots containing initial full vowels

It is observed in S<u>k</u>wxwú7mesh that in bisyllabic roots, primary stress falls on the leftmost full vowel of the prosodic word[6]. At this point in the analysis, we assume that the appropriate prosodic category to describe stress position is the prosodic word; evidence for labelling prosodic word as the domain for stress in Salish is related to the fact that non-reduplicative prefixes are outside the stress domain (Urbanczyk 1996). This pattern is illustrated by the examples in (4) below, each containing full vowels in the initial syllable:

(4a)	[sɬánaj']	<slhánay'>	'lady'
(b)	[p'ɔ́ts'ɔs]	<p'úts'us>	'cradle'
(c)	[mɛ́χaɬ]	<mí<u>x</u>alh>	'black bear'
(d)	[sp'áqəm]	<sp'á <u>k</u>em>	'flower'
(e)	[t'ɛ́mən]	<t'í men>	'muscle'
(f)	[ʃók'ʷəm]	<shúkw'em>	'bathe'

It has been observed that vowel quality is factor in the assignment of stress in S<u>k</u>wxwú7mesh (see Section 5 for further discussion); the examples in (4) above illustrate that regardless of the quality of the second vowel in a bisyllabic form, the first vowel will bear stress, providing that it is a full vowel. Examples (4a) and (4b)

[4]Until acoustic analyses of the exact position of these vowels are conducted, this will be assumed; where appropriate, variation from the presented phonemes are noted. Since we do not have any forms in which the vowel [ɛ] surfaces without stress, we have omitted it from the chart in (3b); we leave this to further research to confirm.
[5] this vowel is realized somewhere in between ɔ and o.

[6]Full vowels are defined as any vowel other than schwa.

demonstrate that when both syllables contain vowels of identical quality, the leftmost vowel is stressed. (4c) shows that when both syllables contain full vowels, but not of identical quality, the vowel of the first syllable bears stress. (4d) through (4f) illustrate that if the second syllable contains a schwa, the initial syllable is stressed.

2.1.2. Roots containing initial schwa

When the initial syllable contains a schwa and the second contains a full vowel, the full vowel bears stress. Consider the following examples:

(5a)	[təχtsám']	<te<u>x</u>tsám'>	'open one's mouth'
(b)	[wənáχʷ]	<wená<u>x</u>w>	'true/truth'
(c)	[qʷəχtsám']	<<u>k</u>we<u>x</u>tsám'>	'(spirit[7])'
(d)	[sqʷəmáj']	<s<u>k</u>wemáy'>	'dog'
(e)	[stəqɛ́w]	<ste<u>k</u>íw>	'horse'
(f)	[ʔəsmɛ́mq']	<7esmím<u>k</u>'>	'something that is pressed down'

The data in (5) above show that regardless of the quality of the second vowel, as long as the initial vowel is a schwa and the second vowel is a full vowel, the second vowel will bear stress.

2.1.3. Roots containing two schwas

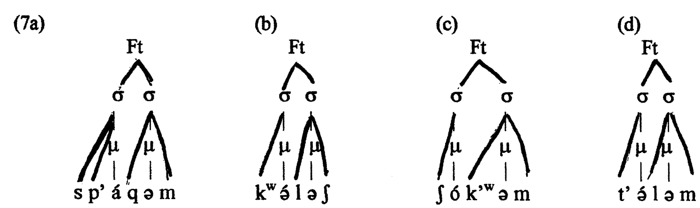
In roots that contain two schwas, the leftmost schwa will bear primary stress. This pattern is demonstrated in (6):

(6a)	[χə́təʔ]	<<u>x</u>éte7>	'far'
(b)	[sə́səlq]	<sésel<u>k</u>>	'be sad'
(c)	[hə́m'tən]	<hém'ten>	'blanket'
(d)	[tʃə́ʃəʔs]	<chéshe7s>	'her mother'
(e)	[kʷə́ləʃ]	<kwélesh>	'shoot'
(f)	[t'ə́ləm]	<t'élem>	'bark from a wild cherry tree used to decorate baskets'

Given these generalizations, an analysis of the metrical foot type exhibited in S<u>k</u>w<u>x</u>wú7mesh can be presented.

2.2. Foot Form

The forms given in (4) and (6) above demonstrate that in S<u>k</u>w<u>x</u>wú7mesh, stress prefers to fall on the leftmost syllable. Trochaic feet are defined as being left-headed at either the moraic or syllabic level (McCarthy and Prince 1995); therefore the data makes it clear that S<u>k</u>w<u>x</u>wú7mesh prefers to build trochaic feet. Since there is no evidence for weight sensitivity in S<u>k</u>w<u>x</u>wú7mesh, we will assume that coda consonants are non-moraic; thus, in the examples below, only two moras surface. Consider the following forms:



[7]The gloss for this word is not certain

Since each of the forms contain two syllables and two moras, it is ambiguous as to whether these feet are moraic or syllabic. If independent evidence for the moraic status of coda consonants is available, defining these feet as syllabic trochees will still predict the correct foot structure.

2.3. Stressed schwa

There is an obvious resistance in Sḵwx̱wú7mesh to stress schwa; this has been noted by Kuipers (1967) as well. This resistance is attested in various other Salish languages (cf. Bianco (1996) for Cowichan (Coast), Hess (1977) for Northern Lushootseed (Central Coast), Shaw and Roberts (1994) for St'át'imcets (Interior) and various others. Furthermore, various languages unrelated to Sḵwx̱wú7mesh exhibit the same pattern; Watt (1998b) claims that schwa never receives stress in Molisano (southern Italian). Kenstowicz (1996) provides data from Kobon (Papua New Guinea), Chukchee and Aljutor (Paleo-Siberian), Mordwin and Mari (Finno-Ugric) and shows how the preference to stress full vowels over schwa patterns cross-linguistically.

The markedness of stressed schwa can be explained by sonority; this notion has been worked out by Kenstowicz (1996). In his sonority-based approach, the resistance to stressing schwa is explained by the fact that schwa is the least sonorous vowel and the less sonorous a vowel is, the worse peak it makes. The issue of sonority with respect to stress will be discussed in greater detail in Section 5.

2.4. Exceptions

Borrowed words are exceptions to the regular pattern; these forms can be explained by the generalization that their stress is assigned in the same way that it is assigned in the language from which they were borrowed. Consider the following examples, all of which were at one point borrowed into Sḵwx̱wú7mesh from French:

(8a)	latám	<latám>	'table (from French *la table*)'
(b)	kapú	<kapú>	'coat (from French *capote*)'
(c)	k^waʃú	<kwashú>	'pig (from French *cochon*)'

(Kuipers 1967)

This data suggest that although the forms have been modified to accommodate the Sḵwx̱wú7mesh vowel and consonant inventory, the French stress system has been retained in these forms. However, recent collected data suggests that these forms are pronounced slightly differently; consider the forms in (13) below:

(9a)	lətám	<letám>	'table'
(b)	kəpú	<kepú>	'coat'
(c)	k^wəʃú	<kweshú>	'pig'

The inconsistency between the vowel quality of the first syllable in each of the forms in (12) and (13) may be attributed to sound change over the past few decades; this suggests that the full vowels in the initial syllables of the forms in (12) reduced to schwa over time. This would not be considered an unusual pattern since the change has created forms that are entirely expected in the Sḵwx̱wú7mesh system (i.e. stress the leftmost *full* vowel of the prosodic word). Interestingly, this data confirms the second part of Kenstowicz's (1996) proposal of margin constraints; schwa makes a better margin than [a] which explains why the sound change might have occurred.

Now that the basic stress pattern has been established in addition to some generalizations about foot structure and the status of schwa, an analysis can be presented.

3. BASIC STRESS PATTERN: AN OT ANALYSIS

The basic claim of OT is that the patterns of each and every language can be explained via the ranking of universal constraints[8]; the purpose of this section is to demonstrate that a particular ranking of five stress constraints

[8]For a detailed discussion of the Optimality Theory framework, see Prince and Smolensky (1993) and McCarthy and Prince (1993).

(McCarthy & Prince 1993) can account for the Sḵwx̱wú7mesh stress assignment patterns outlined in Section 2.

3.1. The Relevant Constraints

As shown in Section 2, Sḵwx̱wú7mesh prefers to build trochaic feet; in an OT framework, this generalization is explained by alignment constraints that make reference to edges or boundaries. The alignment constraint in (10) below ensures that the left syllable of every foot will bear stress; note that this alignment constraint will account for both primary and secondary stress (see Section 4 for a detailed discussion of secondary stress in Sḵwx̱wú7mesh).

10) **Head-L:Align L(H, Ft):** for every head, align that head with the left edge of a foot

A second alignment constraint is needed to position the foot at a particular edge of the prosodic word[9].

11) **Align L(Ft, PWd):** for every foot, align the left edge of that foot, to the left edge of the prosodic word

It was also determined in Section 2 that feet are binary at the syllabic level; therefore, it is necessary to activate some constraint which prefers (σσ) over (σ)(σ). The stress assignment constraint which controls for foot binarity at the syllabic level is formalized as follows:

12) **Foot Bin$_\sigma$:** feet are binary at the syllabic level

To ensure that syllables are parsed into feet, a constraint prohibiting unparsed syllables is required. This constraint is formalized below:

13) **Parse-σ:** parse all syllables into feet

Finally, a peak prominence constraint is required in order to account for the different pattern exhibited in words containing schwa in a stress-bearing position; The constraint below indicates that schwa is not a preferred vowel for stress (Kenstowicz 1996).

14) ***P/ə:** schwa cannot head a foot

These five constraints can capture the stress assignment pattern observed in Sḵwx̱wú7mesh via the following ranking[10]:

(15)

*P/ə >> Head-Left , Parse-σ >> Foot-Bin$_\sigma$, Align-L (Ft, PrWd)

The next subsection will justify this constraint ranking with a series of tableaux.

3.2. Crucial Rankings

Bisyllabic words reveal only one crucial ranking; however, the tableaux in this section include all the crucial rankings which are established in the remaining sections of the paper. To begin, the following tableaux

[9]Until further examination of the effect of prefixes on stress assignment, we assume prosodic word as the relevant prosodic category since there is evidence that reduplicant prefixes can bear stress:

[pə̀ʃ-poʃ=ʔólɬ] push-push-ullh 'many kittens'

[10]We are assuming that all feet have heads; thus, candidates without heads will not be generated. If, under a different analysis, these candidates were to be generated, a constraint banning headless feet would rule those candidates out.

demonstrates crucial ranking between Head-Left and *P/ə.

(16)

/stəqew'/ 'horse'	*P/ə	Head-Left
☞ a. (stəqéw')		*
b. (stə́qew')	*!	

Crucially ranking *P/ə higher than Head-Left reveals the preference in S<u>k</u>wxwú7mesh to stress the rightmost vowel (that is, to stray from the trochaic rhythm) in order to avoid stressing schwa. The next three tableaux show how the established ranking will predict the three types of bisyllabic roots. Firstly, we will look at a word which contains a schwa at its left edge and a full vowel at its right edge.

The constraints *P/ə and Head-Left alone will not rule out all of the relevant candidates generated; thus we have to assume the three other constraints which were outlined in subsection 3.1. The tableau in (17) below incorporates the remaining constraints into the ranking and the correct optimal output is still predicted.

(17)

/stəqew'/ 'horse'	*P/ə	Head-Left	Parse-σ	Foot-Bin$_\sigma$	Align L (Ft, PrW)
☞a. (stəqéw')		*			
b. (stə́qew')	*!				
c. stə(qéw')			*	*!	*
d. (stə́)qew'	*!		*	*	

The established ranking suggest that Head-Left and Parse-σ are not crucially ranked with respect to each other; thus, candidates (c) will not be ruled out by its Parse-σ violation because the optimal candidate violates Head-Left. As a result, candidate (c) will be ruled out by Foot-Bin$_\sigma$.

The tableau in (18) below examines a bisyllabic form in which both syllables contain full vowels. The optimal candidate is correctly predicted by the ranking and does not incur any violations.

(18)

/sɬanaj'/ 'lady'	*P/ə	Head-Left	Parse-σ	Foot-Bin$_\sigma$	Align L (Ft, PrW)
☞a. (sɬánaj')					
b. (sɬanáj')		*!			
c. (sɬá)naj'			*!	*	
d. sɬa(náj')			*!	*	*

Finally, the tableau in (19) below reveals how the established constraint ranking will deal with bisyllabic forms which contain a schwa in both syllables.

(19)

/χətəʔ/ 'far'	*P/ə	Head-Left	Parse-σ	Foot-Bin$_\sigma$	Align L (Ft, PrW)
☞a. (χə́təʔ)	*				
b. (χətə́ʔ)	*	*!			
c. (χə́)təʔ	*		*!	*	
d. χə(tə́ʔ)	*		*!	*	*

It is clear that even though each of the candidates violates *P/ə, the optimal candidate is still predicted since it violates no other constraints.

These constraints and rankings are not enough to predict correct outputs in some morphologically more complex words. When roots combine with some lexical suffixes, stress becomes morphologically conditioned in addition to being phonologically conditioned. The following section will provide an analysis the combination of lexical suffixes and roots, and the effects these combinations have on stress.

4. S<u>K</u>WX<u>W</u>Ú7MESH LEXICAL SUFFIXES

In recent work on Salish phonology, the phonology/morphology interface with respect to stress placement has received some attention. It has been observed that some S<u>k</u>wxwú7mesh lexical suffixes attract main stress (Kuipers 1967, Demers and Horn 1978, Davis 1984). In this section, the interaction between phonological stress assignment and morphological structure will be explained in an OT framework through the interaction of **Stress Assignment constraints** with **Faithfulness constraints**. The goal of this section will be to show that some affixes have metrical structure in the input. This approach was inspired by Idsardi's (1991) work on stress in Interior Salish and Alderete's (1997) analysis of Root-Controlled Accent in Cupeño.
Like Nxa'mxcin (Moses Columbia) (Czaykowska-Higgins 1993), an Interior Salish language, S<u>k</u>wxwú7mesh distinguishes different types of roots and lexical suffixes with respect to how they influence stress. The distinction in roots and lexical suffixes will be referred to as accented versus unaccented. The data analyzed indicate that accented roots are ones containing two syllables, and unaccented roots have only one syllable. For example, /pos/, the word for 'cat', is an unaccented root because it consists of only one syllable, and /mɛ́χaɬ/, the word for 'black bear', is an accented root because it consists of two syllables. Three types of lexical suffixes have been noted in the collected data. They will be referred to as *unaccented, accented* and *inherently accented.* Unaccented lexical suffixes do not attract stress, accented lexical suffixes retain stress when attached to an unaccented (one syllable) root and inherently accented lexical suffixes retain stress without exception. This research is concerned with a total of nine lexical suffixes. In choosing lexical suffixes which represent the various distinctions with respect to stress, Kuiper's (1967) Squamish dictionary was consulted. Since few lexical suffixes remain productive, the nine particular lexical suffixes listed in (20) below, are analyzed in this paper as a result of their productivity amongst the S<u>k</u>wxwú7mesh speakers.

(20)

	Orthography	Phonetic Transcription	Gloss
UNNACCENTED	=ach	=atʃ	'hand'
	=iye<u>k</u>w	=iyεq^W	'on top of head'
	=us	=us/ɔs	'face'
	=inas	=enɪs	'chest'
	=shen	=ʃən	'foot/ankle'
	=mut	=mot	'separate piece'
ACCENTED	=7aw'txw	=ʔaw'tx^W	'house'
INHERENTLY ACCENTED	=ullh	=ɔlɬ	'young specimen'
	=alh	=aɬ	'times/instances'

Unlike roots, lexical suffixes cannot be distinguished in terms of their structure as a result of their phonological similarity. For example, the lexical suffix /=aɬ/ which means 'times/instances' is inherently accented and the lexical suffix /=ɔs/ is unaccented. Both of these lexical suffixes consist of a VC sequence and yet they have very different effects on word level stress. All of the possible combinations of roots and lexical suffixes are illustrated below.

4.1. Roots plus Lexical Suffixes

A comparison of (a) and (c), and (d) and (f) demonstrates that phonologically similar words have different stress patterns.

(21a) Unaccented Root with Unaccented Lexical Suffix
<ts'ulhach>
ts'ɔɬ=atʃ — [ts'ɔ́ɬatʃ] — cv́c=cv
cold hand — 'having cold hands'

(b) Unaccented Root with Accented Lexical Suffix
<ilhenaw'txw>
ʔiɬn=aw'tx^{W} — [ʔiɬnáw'tx^{W}] — cvcc=v́ccc
eat house — 'restaurant'

(c) Unaccented Root with Inherently Accented Lexical Suffix
<kw'inalh>
k$^{w'}$en =aɬ — [k$^{w'}$enáɬ] — cvc=v́c
how many times/instances — 'how many times'

(d) Accented Root with Unaccented Lexical Suffix
<chichipus>
tʃetʃip=ɔs — [tʃétʃipɔ̀s'] — cv́cvc=v̀c
ticklish face — 'ticklish face'

(e) Accented Root with Accented Lexical Suffix
< milha7aw'txw>
meɬə=ʔaw'tx^{W} — [méɬəʔàw'tx^{W}] — cv́cv=cv̀ccc
dance house — 'potlatch house for dancing'

(f) Accented Root with Inherently Accented Lexical Suffix
<xax7utsinalh>
χaχʔotsən=aɬ — [χaχʔɔ̀tsənáɬ] — cvccv̀cvc=v́c
four times/instances — 'four times'

These data clearly reveal that stress assignment is not determined purely phonologically since phonologically similar words have different stress patterns; rather, it is determined both phonologically and morphologically. Furthermore, the examples in (21) demonstrate the hierarchical nature of stress assignment in Skwxwú7mesh with respect to lexical suffixes; if an unaccented root combines with an unaccented lexical suffix, the root receives primary stress. If an unaccented root combines with an accented lexical suffix, the lexical suffix receives primary stress. If an unaccented root combines with an inherently accented lexical suffix, the lexical suffix receives primary stress. When an accented root is combined with an unaccented lexical suffix, the root will receive stress. If an accented root combines with an accented lexical suffix, the root receives primary stress. Lastly, if an accented root combines with an inherently accented lexical suffix, the lexical suffix receives primary stress. The primary stress

hierarchy with respect to these combinations is as follows.

Inherently Accented Suffix >> Accented Root >> Accented Suffix >>Unaccented Root >> Unaccented Suffix

This pattern exhibited with lexical suffixes is typical of Salish languages (Bianco 1995, Czaykowska-Higgins 1993 and others). Interior Salish has been described as having strong and weak roots which correspond to the stress properties which have been outlined for accented and unaccented roots in Skwxwú7mesh (Bianco 1995 and Idsardi 1991). A similar pattern has been noted in Cupeño, an unrelated Takic language which was spoken in Southern California (Alderete 1997) and Slavic (Czaykowska-Higgins 1993), among others.

4.1.1. Unaccented Lexical Suffixes

The following data demonstrate that unaccented lexical suffixes do not attract primary stress. It is clear that the basic trochaic pattern is maintained for words containing these suffixes since words bisyllabic words follow the same patterns described in Section 3. Specifically, bisyllabic words which contain a full in initial position have initial stress, bisyllabic words containing a schwa in the leftmost syllable and a full vowel in the rightmost syllable have final stress and words with two schwas have initial stress. Trisyllabic words in the following data also clarify that parsing of feet is left to right in Skwxwú7mesh since the initial syllable carries main stress and the final syllable bears secondary stress. If feet are parsed from right to left, stress would be incorrectly predicted to fall on the penultimate syllable.

(22) =atʃ **'hand'**

(a) <chichipach>
[tʃétʃipàtʃ]
√tʃétʃip=àtʃ
tickle hands
'somebody's tickling your hands'

(b) <t'at'k'ach>
[t'átq'atʃ]
√t'át'q'=atʃ
hand
'hand of clock'

(c) <tú7ach>
[t'ɔ́ʔatʃ]
√t'ɔ́ʔ=atʃ
hand
'sprained wrist/hand'

(d) <sxwetl'kw'ách>
[sχ^{w}ətl'kw'átʃ]
√sχ^{w}ətl'kw'=átʃ
hand
'wrist'

(23) =iy'ɛq^{W} **'head'**[11]

(a) <nts'ak'iy'ekw>
[nts'áq'iy'ɛ̀q^{W}]
√nts'áq'=iy'ɛ̀q^{W}
top of head
'bald'

(b) <t'esulhiy'ekw>
[t'əsɔ́ɬiy'ɛ̀q^{W}]
√t'əsɔ́ɬ=iy'ɛ̀q^{W}
cold head
'cold head'

[11] This analysis cannot account for:

i) √tʃetʃép=iy'ɛ̀q^{W} — /tʃetʃépiy'ɛ̀q^{W}/ — cvcv́c=vcv̀c
ticklish head
'ticklish head'

At this point in the analysis, there is only one example of a bisyllabic root + [iyɛq^{W}]; therefore it is not yet clear whether other words of the same syllable structure will pattern similarly with respect to stress assignment. Until further research, we assume that this suffix is unaccented.

(c) <sts'ép'iy'ekw>
[sts'ə́piy'ɛ̀q'^{W}]
sts'ə́p=iy'ɛ̀q'^{W}
top of head
'gr gr grandparent'

(24) =ɔs/us **'face'**

(a) <nshaw'us>
[nʃáw'ɔs]
√nʃáw'=ɔs
face
'cheek bone'

(b) <s7atsus>
[sʔátsus]
√sʔáts=us
face
'face'

(c) <kixwus>
[qɛ́χɔs]
√qɛ́χ=ɔs
face
'blind'

(d) <nkwú7us>
[nqwɔ́ʔɔs]
√nqwɔ́ʔ=ɔs
face
'tears'

(e) <ts'esp'i7us>
[ts'əsp'éʔɔs]
√ts'əsp'éʔ =ɔs
face
'ugly faced'

(f) <chichipus>
[tʃétʃipɔ̀s]
√tʃétʃip=ɔ̀s
ticklish face
'ticklish face'

(25) =enɪs **'chest'**

(a) <skweninas>
[sk^{W}énen̓ɪs]
√sk^{W}én=en̓ɪs
hairy chest
'hairy chest'

(b) <s7ilinas>
[sʔélen̓ɪs]
√sʔél=en̓ɪs
chest
'chest'

(26) =ʃən **'foot'**

(a) <xéwtl'shen>
[xáwtl'ʃən]
√χáwtl'=ʃən
broken foot
'broken ankle'

(b) <kw'xwuy'kwuy'shen>
[q'^{W}x^{w}ɔ́y'q'^{W}χɔy'ʃən]
√q'^{W}x^{w}ɔ́y'q'^{W}χɔy'=ʃən
nail foot
'toe nail'

(27) =mot **'separate piece'**

(a) <xex7útsenmut>
[χaχʔótsənmɔ̀t]
√χaχʔótsən=mɔ̀t
four sep. piece
'four separate pieces'

(b) <nch'u7mut>
[ntʃ'ómot]
√ntʃ'ó=mot
one sep. piece
'one separate piece'

It is interesting to note that, consistent with the basic stress pattern, the bisyllabic form in (22d) above [sχ^{w}ətl'kw'átʃ] demonstrates that the unaccented suffix bears stress in order to avoid stressing schwa.

The analysis of the basic stress assignment presented in Section 3 above can capture the pattern of bisyllabic forms in (22-27) above; however, problematic to this analysis are trisyllabic words. Since these words are parsed into two feet, the present grammar can generate candidates in which there are two adjacent stressed syllables are stressed as potential optimal candidates. Candidate (a) in the following tableau is the form which should be generated by the grammar, however, candidates (b) is predicted to be optimal by this ranking. This is shown in the tableau in (28) below (note that the * indicates the incorrect surface form).

(28)

/tʃetʃipɔs/ 'ticklish face'	*P/ə,	Head-Left	Parse-σ	Foot Bin$_\sigma$	Align L(Ft, PrW)
a. (tʃétʃip)(ɔ́s)				*	**!
*☞b. (tʃé)(tʃípɔs)				*	*
c. tʃe(tʃípɔs)			*!		*
d. (tʃétʃip)ɔs			*!		

Since words never surface with adjacent stresses in Skwxwú7mesh it is evident that stress clash is prohibited. In order to reflect this in that grammar it is necessary to introduce a rhythm constraint. This constraint will be defined as follows.

(29) ***σ́σ́**: adjacent stressed syllables are prohibited

At this point, the no clash constraint (*σ́σ́) does not require crucial ranking; however, in comparing (c) and (d) with (a), it is clear that Parse-σ outranks Foot Bin$_\sigma$. Also, a comparison of candidates (d) and (a) reveals that Parse-σ outranks Align L (Ft, PrW).

(30)

/tʃetʃipɔs/ 'ticklish face'	*σ́σ́	*P/ə,	Head-Left	Parse-σ	Foot Bin$_\sigma$	Align L(Ft, PrW)
☞ a. (tʃétʃip)(ɔ́s)					*	*
b. (tʃé)(tʃípɔs)	*!				*	*
c. tʃe(tʃípɔs)				*!		*
d. (tʃétʃip)ɔs				*!		

As demonstrated in (30) above, the addition of an anti-stress clash constraint correctly predicts (a) as the optimal candidate. At this point, there remains one crucial ranking that can be established with unaccented suffix data; an examination of the form [tʃ'əsp'éʔɔs] in the following tableau, demonstrates that *P/ə crucially outranks Parse-σ.

(31)

/tʃ'əsp'eʔɔs/ 'ugly faced'	*σ́σ́	*P/ə,	Head-Left	Parse-σ	Foot Bin$_{\sigma}$	Align L(Ft, PrW)
☞ a. (tʃ'əsp'é)ʔɔs			*	*		
b. (tʃ'ə́)(sp'eʔɔ̀s)		*!			*	*
c. (tʃ'əp'é)(ʔɔ̀s)	*!		*		*	**
c. (tʃ'ə́p'e)(ʔɔ̀s)		*!			*	**

In this subsection it has been observed that words containing unaccented lexical suffixes follow the basic stress pattern. Their increased morphological complexity, and hence length, has revealed the existence of an anti-stress clash constraint in the grammar. Accented lexical suffixes differ from unaccented lexical suffixes in that they attract stress in certain environments; as a result, some words containing accented lexical suffixes are problematic the present analysis, as is expected. The next subsection will demonstrate that the introduction of another constraint will capture the pattern of the accented suffixes.

4.1.2. Accented Lexical Suffix:

Accented lexical suffixes can bear stress, but do not always bear stress. When they are suffixed to unaccented roots (monosyllabic roots), they receive primary stress; when they are suffixed to accented roots (bisyllabic roots), they receive either secondary stress or no stress at all, depending on where primary stress falls. This is to say that if the leftmost syllable of the root bears primary stress, the accented lexical suffix will bear secondary stress. Secondary stress is entirely predictable since it falls on alternating syllables preceding or following syllables bearing primary stress. On the other hand, if the rightmost syllable of the accented root bears stress, the accented lexical suffix will not bear any stress.

(32) =ʔaw'tx^{W} 'house'

(a) <k'iy'áwxw>
[q'eʔáw'tx^{w}]
√q'e=ʔáw'tx^{W}
house
'smoke house'

(b) <t'ák'its'aw'txw>
[t'ák'ets'àw'tx^{W}/
√t'ák'ets'=àw'tx^{W}
log house
'log cabin'

(c) <t'aki'its'aw'txw>
[səláw'tx^{W}]
√səl=áw'tx^{W}
house
'tent'

(d) <milha7aw'txw>
[méɬəʔàw'tx^{W}]
√méɬə=ʔàw'tx^{W}
dance house
'potlatch dancing house'

(e) <ilhnaw'txw>
[ʔiɬnáw'tx^{W}]
√ʔiɬn=áw'tx^{W}
eat house
'restaurant'

(f) <spak'em>
[spáq'əmʔáw'tx^{W}]
√spáq'əm=ʔàw'tx^{W}
flower house
'flower shop'

(g) <tl'ashen>
[ɬáʃənʔàw'tx^{W}]
√ɬáʃən = ʔàw'tx^{W}
gathering house
'potlatch gathering house'

(h) <skwemay'aw'txw>
[sq^{W}əmáyʔaw'tx^{W}]
√sq^{W}əmáy=ʔaw'tx^{W}
dog house
'dog house'

(i) <stekiw'aw'txw>
[st'əqéw'aw'tx^{W}]
√st'əqéw'=aw'tx^{W}
horse house
'barn'

(j) <sp'utl'em'aw'txw>
[sp'ɔ́tl'əmʔàw'tx^{W}]
√sp'ɔ́tl'əm=ʔàw'tx^{W}
smoke house
'smoke shop'

These data are inconsistent with our analysis of the basic stress assignment pattern observed in Skwxwú7mesh; given the analysis presented in Section 4, we would predict that in a bisyllabic form (in this case, a monosyllabic root + a monosyllabic lexical suffix) the leftmost syllable (namely, the root) would receive stress; however, in the word [səláw'tx^{w}] 'tent', stress falls on the rightmost syllable (the lexical suffix). Since the constraint ranking, as presently stated, will predict the incorrect candidate to be the optimal one, it becomes necessary to introduce a faithfulness constraint which is morphologically conditioned. Since phonologically conditioned constraints cannot predict morphologically conditioned stress, we propose that accented lexical suffixes are prominent in the input and appeal to prosodic affix faithfulness to account for their tendency to attract stress. In his analysis Cupeño, Alderete (1997) proposes a correspondence constraint that governs the relation of prominence in the input and the output. To ensure that the correct optimal candidates are selected, the following faithfulness constraint is assumed:

(33) **MAX-P$_{Af}$:** Every prominence in an affix in the input must have a prominence in the output

In other words, accented suffixes are specified for prominence in the input and that prominence should be respected in the output[12]. Introducing MAX-P$_{Af}$ predicts the optimal candidate in /səláw'tx^{W}/ 'tent'.

(34)

səl[áw'tx^{W}]$_{af}$ 'tent'	*σ́σ́	*P/ə	MAX-P$_{Af}$	Head-Left	Parse-σ	Foot-Bin$_{\sigma}$	Align L(Ft, PrW)
√ a. (səláw'tx^{W})				*			
b. (sə́law'tx^{W})			*!				

The tableau in (34) demonstrates that MAX-P$_{Af}$ crucially outranks Head-L. In looking at phonologically more complex words it is evident that there is crucial ranking with respect to MAX-P$_{Af}$. The word /st'əqéw'aw'tx^{W}/ 'barn' demonstrates that *P/ə crucially outranks MAX-P$_{Af}$.

[12] Thus far, this is the only suffix recorded that displays this tendency towards receiving stress; further research will confirm the proposal that there is a class of lexical suffixes in which prominence exists in the input.

(35)

st'əqew' [áw'tx^{W}]$_{af}$ 'barn'	*σ́σ́	*P/ə	MAX-P$_{Af}$	Head-Left	Parse-σ	Foot-Bin$_{σ}$	Align L (Ft, PrW)
☞a. stə(qéw'aw'tx^{W})			*		*		*
b.(st'э́qew')(àw'tx^{W})		*!				*	**
c. (st'əqéw')(àw'tx^{W})	*!			*		*	**

The final class of lexical suffixes that will be addressed is the inherently accented suffix which attracts primary stress; the next subsection will introduce this data and another prosodic faithfulness constraint.

4.1.3. Inherently Accented Lexical Suffix:

Inherently accented lexical suffixes receive primary stress without exception; secondary stress falls on every other syllable preceding or following it. Consider the examples below:

(36) =ɔlɬ **'young specimen'**

(a) <pushúllh>
[pɔʃɔ́lɬ]
√pɔʃ=ɔlɬ
cat young specimen
'kitten'

(b) <mi<u>x</u>alhúllh>
[mə̀χaɬɔ́lɬ]
√mə̀χaɬ= ɔ́lɬ
black bear young specimen
'cub'

(c) <s7ixwalhúllh>
[sə̀x^{W}aɬɔlɬ]
√sə̀x^{W}aɬ=ɔ́lɬ
child young specimen
'young child'

(d) <skwèmay'úllh>
[sq^{W}ə̀may'ɔ́lɬ]
√sq^{W}ə̀may'=ɔ́lɬ
young specimen
'puppy'

(e) <swi7<u>k</u>a7úllh>
[swə̀ʔqaʔɔ́lɬ]
√swə̀ʔqaʔ=ɔ́lɬ
man young specimen
'young man'

(37)

(a) <t'ak'usachálh>
[t'ak'ə̀satʃáɬ]
t'ak'ə̀satʃ=áɬ
seven times/instances
'seven times'

(b) <<u>x</u>a<u>x</u>7utsenúlh>
[χaχʔə̀tsənáɬ]
χaχʔə̀tsən=áɬ
four times/instances
'four times'

The example in (36d) above demonstrates that it is more important to stress the inherently accented suffix than it is to avoid stressing schwa.

If we assume prominence in the input for inherently accented suffixes and we use the ranking that has been established up until this point, incorrect optimal candidates are predicted. This is shown in the tableau in (37) below:

(38)

sq^{W}əmay [ɔ́ɬ]$_{af}$ 'puppy'	*σ́σ́	*P/ə	MAX-P$_{Af}$	Head-Left	Parse-σ	Foot-Bin$_{σ}$	Align L(Ft, PrW)
*√ a. sq^{W}ə(máyɔɬ)			*		*		*
b. (sq^{W}ə́may)(ɔ́ɬ)		*!				*	**

Since inherently accented lexical suffixes get stress without exception and accented lexical suffixes are not always stressed, it follows that these differences must be accommodated for in grammar.

Inspired by Idsardi (1991) Alderete (1997) and following correspondence theory, to account for words containing inherently accented suffixes, we propose that there is underlying structure in the input and that there is input-output faithfulness governing the correspondence of that prosodic structure. If the suffix receives stress without exception, it must always head a foot. Proposing underlying structure in the input is a way of guaranteeing that the inherently accented suffix will always head a foot. This prosodic faithfulness constraint is defined as follows.

(39) **MAX-Ft:** All prosodic structure in the input must have a correspondence in the output.

In other words, inherently accented lexical suffixes are footed in the input, and the output should be faithful to the structure in the input. Consider the tableau in (40):

(40)

sq^{W}əmay [(ɔlɬ)]$_{af}$ 'puppy'	MAX-Ft	*σ́σ́	*P/ə	MAX-P$_{Af}$	Head-L	Parse-σ	Foot Bin$_{σ}$	Align L (Ft, PrW)
a. sq^{W}ə(máyɔlɬ)	*!					*		*
√ b. (sq^{W}ə́may)(ɔ́lɬ)			*				*	**
c. (sq^{W}əmày)(ɔ́lɬ)		*			*		*	**

A comparison of candidates (b) and (c) in the tableau in (40) above demonstrates that it is more important to avoid a stress clash than to stress a schwa; hence, *σ́σ́ crucially outranks *P/ə; furthermore a comparison of candidates (a) and (b) demonstrate that MAX-Ft crucially outranks *P/ə.

In this section it was demonstrated that the stress is phonologically determined in words of the structure root + unaccented lexical suffix, and that it is morphologically and/or phonologically determined in words of the structure root + accented/inherently accented lexical suffixes. To account for the latter, two prosodic faithfulness constraints were introduced. In conjunction with the phonologically driven constraints on stress assignment, these two constraints predicted optimal candidates for the apparently exceptional forms.

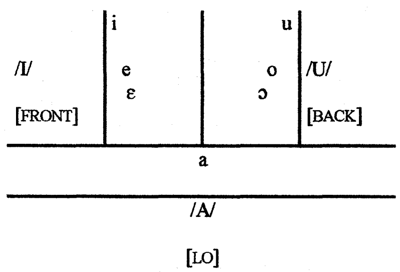
5. VOWEL QUALITY: BEYOND SCHWA

As outlined in Section 1, most phonetic vowels in S̲kwx̲wú7mesh can bear stress while certain vowels cannot. The goal of this section is to account for the surface realizations of S̲kwx̲wú7mesh vowels; specifically, we will account for the fact that high vowels in S̲kwx̲wú7mesh cannot bear stress. We begin this part of our analysis with a discussion of full vowel place specifications.

5.1. Place Specifications

Although eight full vowels surface phonetically in S̲kwx̲wú7mesh, the three front vowels are non-contrastive with respect to each other and the three back vowels are non-contrastive with respect to each other. To account for these facts, we follow Kuipers (1967) in assuming a three-way underlying vowel distinction; thus, underlyingly, we assume that there are three place specifications: [FRONT], [BACK] and [LO]. This is shown in (41) below (the vowels in slanted brackets correspond to each group of vowels; these symbols will be represented in the input):

(41)



Following Kuipers (1967) , we assume that schwa is predictable in S̲kwx̲wú7mesh; thus we do not identify schwa in the input. Instead, we assume that constraints on syllable structure will force epenthetic schwa to surface in output forms, though we do not make reference to these constraints in this analysis as this related discussion is beyond the scope of this paper.

5.2. Quality-Sensitivity: Kenstowicz (1996)

Kenstowicz (1996) analyzes the effect of vowel quality on determining the location of stress. He proposes that stress seeks out the most optimal vowel as determined by the two sonority scales given in (42) below:

(42a) a > e,o > i,u lower > higher
(b) a,e,o,i,u > ´ peripheral > central

Following Prince and Smolenksy (1993) who use the sonority hierarchy in syllabification to argue for a Peak-Prominence constraint, Kenstowicz argues for a prominence hierarchy, where the more sonorous the phoneme, the more likely it is to be a peak and the less sonorous the phoneme, the more likely it is to be a margin. He shows that there are languages which define metrical stress through the alignment of the prominence scales in (42) above with the peak>trough scales for metrical feet. Kenstowicz claims that the hierarchies are derived from the following constraint rankings that are fixed in UG; thus, individual grammars cannot reverse any of these orderings (note that P refers to peak and T refers to trough):

(43) *P/i,u >> *P/e,o >> *P/a
*Pə >> *P/i,u,e,o,a
*T/a >>*T/e,o >>*T/i,u
*T/a,e,o,i,u >> Tə

Within an OT framework, Kenstowicz gives evidence for dividing Prince and Smolensky's Peak-Prominence constraint into micro-constraints by showing how other constraints can be ranked within the micro-constraints. Using Kenstowicz's model, the phonetic realizations of stressed vowels in S̲kwx̲wú7mesh can be explained.

Recall that the S̲kwx̲wú7mesh grammar prefers to stress a full vowel that is not at the left edge of a foot over stressing a schwa that is at the left edge of a foot; in Section 3, this resistance to stressing schwa was captured by ranking the peak-prominence micro-constraint *P/ə higher that the Head-Left alignment condition. Turning to the full vowels, it is observed that the high vowels [i] and [u] never appear in stressed position in S̲kwx̲wú7mesh. The behaviour of the high vowels differs from the behaviour of schwa of schwa in two ways; firstly, while schwa will bear stress when there is no other full vowel available, the high vowels never bear stress. Secondly, there are no forms in which stress will fall on a second syllable in order to avoid stressing a high vowel at the left-edge of a foot. Instead, we observe that leftmost full front/back vowels that bear stress are [e] or [ɛ] for the front vowels and [o] or [ɔ] for the back vowels. To explain the resistance of S̲kwx̲wú7mesh to stressing the high vowels [i] and [u], we assume the following peak-prominence constraint:

(44) ***P/[HI]:** vowels with the specification [HI] cannot head a foot

This constraint will rule out candidates in which [i] or [u] bears stress, since they are the high vowels of S̲kwx̲wú7mesh.

Although it assumed that all peak-prominence micro-constraints are present in the S̲kwx̲wú7mesh grammar, constraints such as *P/e,o and *P/a are not crucial to the selection of the correct optimal candidate. Since [e], [o] and [a] are the preferred vowels for stress in S̲kwx̲wú7mesh, *P/e,o and *P/a will consistently be violated by optimal candidates and have thus been omitted from the ranking.

5.3. Feature Faithfulness

Since the front and back vowels are non-contrastive, it is necessary to assume two possible inputs: one that includes the place specification [HI] and one that does not. Assuming that the feature [HI] is present in the input, crucial ranking of *P/HI higher than faithfulness to the feature [HI] will be established. The relevant faithfulness constraint is given in (45) below:

(45) **MAX-HI:** Any place feature HI present in the input must have a correspondent in the output

The crucial ranking is shown in the tableau in (46) below (for expository purposes, we present the feature [HI] with the vowel [i]):

(46)

/miχAɬ/ 'black bear'	*P/ HI	Max-HI	Head-Left
☞a. (mέχaɬ)		*	
b. (míχaɬ)	*!		
c. (miχáɬ)			*

If it is assumed that the feature [HI] is not present in the input, a second faithfulness constraint must be assumed. This constraint is given in (47) below:

(47) **DEP-HI:** Any place feature HI present in the output must have a correspondent in the input

However, crucial ranking between *P/ HI and DEP-HI cannot be established. This is demonstrated in the tableau in below:

(48)

/mIχAɬ/ 'black bear'	*P/ HI	DEP HI	Head-Left
☞a. (mέχaɬ)			
b. (míχaɬ)	*!	*	
c. (miχáɬ)			*

Because *P/HI is never violated by the optimal candidate, it is impossible to demonstrate crucial ranking with *P/ə; however, we will assume based on Kenstowicz's sonority hierarchy that *P/ə crucially outranks *P/HI. The following tableau incorporates these constraints into the established ranking (note that we are not assuming that the feature [HI] is in the input):

(49)

/mIχAɬ/ 'black bear'	Max -Ft	*σ́σ́	*P/ə	Max-P_{af}	Head-Left	Parse-σ	Foot Binσ	Align L (Ft, PrW)	*P/ HI	Dep HI
☞a. (mέχaɬ)										
b. (míχaɬ)									*!	*
c. (mεχáɬ)					*!					

Notice that the front vowel in the first syllable in [mέχaɬ] is transcribed with a [ε] instead of an [e]; this may be related to consonant-vowel interaction in Skwxwú7mesh. The next subsection will address this issue in further detail.

5.4. Consonant-vowel interaction

A preliminary examination of consonant-vowel interaction suggests that the post-velar consonants may have a lowing effect on front and back vowels in Skwxwú7mesh. Consider the examples in (50) and (51) below:

(50a)	[mέχaɬ]	<mixalh>	'black bear'	(51a)	[kʷópits]	<kupits>	'elder sibling'
(b)	[qέχɔs]	<kíxus>	'blind'	(b)	[tʃétʃip]	<chíchip>	'ticklish'
(c)	[nέq'ʷəm]	<níkw'em>	'soft'	(c)	[sʔátsus]	<s7átsus>	'face'
(d)	[q'əχq'έχ]	<k'exq'íx>	'become black'	(d)	[xʷétəm]	<xwítem>	'jump'
(e)	[t'ɔ́ʔatʃ]	<t'ú7ach>	'sprained wrist/hand'	(e)	[ʃékʷ]	<shíkw>	'clam'

All the front and back vowels in (50) occur adjacent to postvelar consonants and are realized as [ε] and [ɔ], respectively; the front and back vowels in (51) are realized as [e] and [o], respectively and do not occur in the same environment. The phonetic realization of vowels adjacent to postvelars in Salish has been analyzed by Shahin (1997) for St'át'imcets (Interior Salish. Further examination of vowel quality and context will help to determine what is responsible for the variation of front and back vowels in Skwxwú7mesh.

6. CONCLUSION

This paper has attempted to demonstrate how position, the lexicon and vowel quality interact in determining how stress is assigned in Skwxwú7mesh. We have shown that the basic stress pattern can be captured via the ranking of five stress assignment constraints. Data on lexical suffixes suggest that a stress clash constraint and two prosodic faithfulness constraints are required to account for the fact that accented lexical suffixes do not attract stress, accented suffixes attract stress only when suffixed to unaccented roots and inherently accented suffixes always attract stress. Finally, we have shown that a second prominence constraint banning [Hí] vowels in stressed position is needed to account for the fact that [i] and [u] never bear stress. Although a complete analysis of consonant-vowel interaction has not yet been established, the pursuit of this issue may prove to explain why certain variants of front and back vowels surface. Examination of other Skwxwú7mesh lexical suffixes as well as the examination of the quality of vowels in various contexts will confirm the generalizations and analysis proposed in this paper.

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APPENDIX: KEY TO THE ORTHOGRAPHY

orthography	*phonetic symbol*	*orthography*	*phonetic symbol*
p	p	kw	k^w
p'	p'	kw'	k'^w
m	m	xw	x^w
m'	m'	k̲	q
t	t	k̲'	q'
t'	t'	k̲w	q^w
ts	ts	k̲w'	q'^w
ts'	ts'	x̲	χ
s	s	x̲w	χ^w
n	n	h	h
ch	tʃ	w	w
ch'	tʃ'	y	j
sh	ʃ	y'	j'
lh	ɬ	e	ə
lh'	tl'	i	i,e,ɛ
l	l	u	u,o,ɔ
k	k	a	a
k'	k'	7	ʔ