

Vowel harmony and schwa strengthening in Skw̓w̓w̓mesh

Peter Jacobs
University of Victoria¹

In this paper, I provide a further phonological basis for Jacobs' (2011) hypothesis that the vowel (V) before the directive (DIR) is an epenthetic schwa in Skw̓w̓w̓mesh. I argue V's other realizations can independently be accounted for by vowel harmony and schwa strengthening. Dyck (2004) provides a formal analyses for vowel harmony for the Squamish directive. I present more vowel harmony data in other constructions and extend her account to these constructions. I then present data with instances of schwa alternating with a stressed /á/, describing some of them as schwa strengthening. I argue that schwa strengthening takes place (in environments yet to be fully understood) to fulfill moraic requirements that schwa or its coda cannot on their own. Since these processes are independent of the directive, I conclude that it is not necessary to include them in the directive's lexical description.

1 Introduction

The Directive is a very common transitive construction in Skw̓w̓w̓mesh. It is comprised basically of a root/stem followed by a vowel (V) and then the transitivizer *-n*. The vowel preceding the transitivizer *-n* has various realizations: as a copy vowel of the root vowel (1a), as an unstressed schwa (1b), as a stressed schwa (1c) or as a stressed low vowel /á/ (1d).

¹ Chen kw'enmantumiyap i7xw ta newyap na ch'awats i ti sts'its'ap'. I7xw ta na st'emt'am men n-swa7. Thank you to all who helped from our Elders, the Squamish Language Program, my dissertation committee and particularly to Jason Brown for helping to make my thoughts and writing clearer. This research was made possible by support from the Squamish Nation Education Department. All thoughts, words and errors, though, are ultimately my own. Timá tkwetsi.

- (1) a. **chen** **yúts'-u-n²**
 1S.SUB nudge-V-DIR
 'I nudged him.'
- b. **chen** **p'í7-shn-e-n**
 1S.SUB grab-foot-V-DIR
 'I nudged him.'
- c. **na p'ayaḱ-é-n-t-as** **ta tetxwem**
 RL fix-V-DIR-TR-3SUBJ DET car
 'He fixed the car.'
- d. **xits-k-á-n** **chen ek' ta stsek**
 lay-bottom-V-DIR 1S.SUB FUT DET tree
 'I'm going to fell a tree.'

In this paper I provide further argumentation for my analysis in Jacobs (2011), wherein this vowel is an epenthetic schwa. I will argue that each of its different realizations can be derived from more general phonological properties in the language. This analysis will include a phonological account for V's realization as a copy vowel (cf. Dyck 2004) and for its realization as a stressed /á/. For the copy vowel I will argue that this realization is derived from a more general vowel harmony process in Skwxwú7mesh (cf. Dyck 2004). For the stressed /á/ realization I will appeal to a phenomena which I will call *schwa strengthening*.

This paper is organized as follows. In section (§2), I provide a full description for the distribution of V. In (§3), I present all the different cases of vowel harmony in Squamish. In (§4), we examine the cases where stressed /á/ alternates with schwa. In (§5), I provide my analysis of the various realization of V in the directive construction. In (§6) I provide the conclusion.

² The following are the abbreviations used in this papers: 1S.OBJ = first person singular object, 1PL.POSS = first person plural possessive, 1S.INDP = first person singular independent, 1S.SUB = first person singular subject, 2.OBJ = second person object, 2S.SUB = second person singular subject, 3OBJ = third person object, 3POSS = third person possessive, 3SUBJ = third person subject, CAUS = causative, CRECIP = control reciprocal, DEM = demonstrative, DET = determiner, DIR = directive transitivizer, FUT = future tense, IMPER = imperative, IMPF = imperfective aspect, INTR = intransitivizer, LCRECIP = reciprocal, LOC = locative, NOM = nominalizer, PASS = passive, PL = plural, RED = CVC reduplicant, REDIR = redirective transitivizer, RL = realis aspect, STAT = stative, SUBJ = subjunctive, TR = transitivizer, V = vowel, VDIR = vowel directive transitivizer

2 The Vowel before the *-n* Directive

As described in the introduction, the DIR in Sḵw̓w̓mesh has a vowel immediately preceding it. This vowel has four different realizations:

- i. copy vowel of the root (i.e. vowel harmony)
- ii. stressed schwa /é/
- iii. unstressed schwa /e/
- iv. stressed /á/

In this section I demonstrate that these realizations are conditioned by the shape of the root, or stem, that the DIR is attached to, as well as by stress.

2.1 V with CVC roots

The following are examples where V is realized as an unstressed copy vowel of the root vowel when the root itself has the shape CVC (Demers and Horn 1978, Dyck 2004). It occurs with all four vowels in Squamish (*a, i, u, e*).

- (2) DIR
- a. na p'áts'-a-n-t-as ta yeḵwáy.
RL sew-V-DIR-TR-3SUBJ DET dress
'She sewed the dress.'
 - b. na t'íxw-i-n-t-as ta lapát.
RL down-V-DIR-TR-3SUBJ DET cup
'He took the cups down (from the shelf).'
 - c. na ḵw'úp'-u-n-t-as ta yeḵwáy.
RL pleat-V-DIR-TR-3SUBJ DET dress
'She pleated the dress.'
 - d. na péts-e-n-t-as ta hémten.
RL fold-V-DIR-TR-3SUBJ DET blanket
'She folded the blankets.'

Generally in Squamish, unstressed full vowels (*a, i, u*) can be reduced to schwa. This is also true of V, which is often realized as

schwa. Often we obtain (3a) instead of (2a), (3b) instead of (2b) and (3c) instead of (2c).

- (3) a. **na p'áts'e-n-t-as ta yeḵwáy.**
 RL sew-V-DIR-TR-3SUBJ DET dress
 'She sewed the dress.'
- b. **na t'íxw-e-n-t-as ta yeḵwáy.**
 RL down-V-DIR-TR-3SUBJ DET dress
 'She took the dress down (form the shelf).'
- c. **na ḵw'úp'e-n-t-as ta yeḵwáy.**
 RL pleat-V-DIR-TR-3SUBJ DET dress
 'She pleated the dress.'

2.2 V with CVR7 and CeCC roots

V can also be realized as a stressed /á/ when the DIR is attached to:

- i. roots of the shape CVR7, that is, a CVC root where the second C is a glottalized resonant as in (4a-b),
 - ii. roots of the shape CeCC (5a-b), that is, roots where the vowel is a schwa and the coda has two consonants.
- (4) a. **na t'am'á-n-t-m t'l'a Jack**
 RL removed-V- DIR-tr-pass OBL/DET Jack
 'Jack removed it.'
- b. **na taw'á-n-t-m**
 RL lighted-V- DIR-TR-PASS
 'He was illuminated by him (e.g. with a flash-light) (Kuipers 1967: 264)
- (5) a. **na temlh-á-n-t-Ø-as ta s7átsus**
 RL ocre-V- DIR-TR-3OBJ-3SUB DET face
 'He put ocre on his face.'
- b. **chen kw'enm-á-n-t-umi**
 RL thank-V- DIR-TR-2.OBJ
 'I thank you.'

2.3 V with CVC roots plus lexical suffix

Examples (6a-b) below have a CVC root followed by a lexical suffix (CVC-LS). In these cases, stress can vary depending on whether there are further suffixes or clitics following the DIR. When the primary stress is on the verbal root, then V is realized as an unstressed schwa (6a). However, when the primary stress is shifted to V, V is realized as /á/ (6b).³

- (6) a. **chen** **xíts-ḳ-e-n-(t)-∅**⁴ **ta** **stseḳ**
 1S.SUB lay-bottom-V- DIR-TR-3OBJ DET tree
 ‘I fell a tree.’ (Kuipers 1967: 369)
- b. **xíts-ḳ-á-ń-(t)-∅** **chen** **kwetsi stseḳ**
 lay-bottom-V-DIR-TR-3OBJ 1S.SUB DEM tree
 ‘I’m going to fell a tree.’ (Kuipers 1967: 369)⁵

A different case obtains with roots of the shape CVCVC. They are similar to CVCC roots and CVC-LS, in that they are longer than CVC roots. With these roots, V can occur stressed or unstressed, again depending on whether other suffixes or clitics follow. However, when V is stressed with these roots, it surfaces as a stressed schwa, as in (7a), and not as a stressed /á/, as in (5a-b) and in (6b). When unstressed after a CVCVC root, V surfaces as an unstressed schwa (7b).

- (7) a. **na p’ayaḳ-é-n-t-∅-as** **ta** **tétxwem**
 RL fix-V- DIR-TR-3OBJ-3SUB DET car
 ‘He fixed the car.’
- b. **chen p’áyaḳ-e-n-(t)-∅**
 1S.SUB fix-V-DIR-TR-3SUB
 ‘I fixed it.’

³ Stress shifts because of the following subject clitic.

⁴ The transitivizer *-t* gets deleted when it is word final following another transitivizer that ends in a consonant. In this case, it is following the consonantal DIR *-n*.

⁵ The DIR is glottalized in this example. I leave a phonological account for this glottalization for future research. Dyck (2004) does provide an account for resonant glottalization in *Skw̘wu7mesh*, however does not extend it to these cases.

2.4 Summary of V

The following table summarizes the various realizations of V.

Base	V	
	Stressed	Unstressed
CVC		copy vowel e
CVR7 CeCC	á	
CVC+LS	á	e
CVCVC	é	e

Table 1: Realizations of V

When V follows a:

- i. CVC root, it can be realized as either an unstressed copy of the root's vowel or as an unstressed schwa.
- ii. CVR7 or a CVCC root, it is realized as a stressed /á/.
- iii. CVC+LS, it can be realized as either a stressed /á/ or an unstressed schwa.
- iv. CVCVC root, it can be realized as either a stressed schwa or an unstressed schwa.

3 Vowel harmony in Sḱwḱwu7mesh

In this section I examine two types of vowel alternations that I will call vowel harmony. One type of vowel harmony is where the phonemic quality of a vowel changes to match that of another vowel, and will therefore be described as *phonemic vowel harmony*. The copy vowels associated with V and the CVC roots above in (2a-d) are a type of phonemic vowel harmony. A second type of vowel harmony is where the allophones of two phonemically identical vowels harmonize. I will call this *allophonic vowel harmony*. Throughout our investigation, we will note that vowel harmony occurs only in the configuration of CVCV, except for those cases involving clitics.

3.1 Phonemic vowel harmony

Phonemic vowel harmony, as mentioned, also occurs in other constructions besides the DIR. These other constructions include:

- i. another transitive construction: the *-V-t* transitive construction
- ii. some intransitives with the intransitive suffix *-m*.
- iii. CV7 bare roots
- iv. diminutive reduplication
- v. one possible case with a non-suffixed intransitive
- vi. one numeral
- vii. one possible case with an independent noun
- viii. one lexical suffix
- ix. two aspectual clitics

3.1.1 Transitives: the vowel directive transitivizer

There is a closed set of CVC roots which have a copy vowel as their transitivizer, but no DIR *-n* (Jacobs 2011). The analysis presented here follows Jacobs (2011), who analyzes the copy vowel as a non-automatic allomorph of the *-n* transitivizer, somewhat similar to Kuipers (1967:69). I will call V in this construction the VDIR, or the Vowel Directive, to distinguish it from the V that occurs before the DIR *-n*. In other words, the distribution of the Directive as *-n* or as VDIR is not determined by phonological factors. The *-t* following the VDIR is itself a second transitivizer. Kuipers (1967:69) analyzes this construction as comprised of a root followed by a transitivizer *-Vt*. I differ from him in that I have divided this sequence into two transitivizers *-V* and *-t*. I will call the CVC roots which take the VDIR, VDIR roots. The following are examples of VDIR roots with the VDIR.

- (8) a. **na káw-a-t-as** **ta s7ílhen.**
 RL down-VDIR-TR-3SUBJ DET food
 ‘She brought the food down (towards the beach).’
- b. **na lhích’-i-t-as** **ta seplín.**
 RL cut-VDIR-TR-3SUBJ DET bread
 ‘She sliced the bread.’
- c. **na kw’úk-w-u-t-as** **ta shemán-s.**

RL beat-VDIR-TR-3SUBJ DET enemy-3POSS
 ‘He beat up his enemy.’

- d. na kp’-é-t-as ta shewálh
 RL close-VDIR-TR-3SUBJ DET door
 ‘She closed the door.’

Again, since unstressed full vowels can be reduced to schwa, VDIR can also be realized as schwa. But schwa reduction seems to happen less in this construction than it does in the *-n* DIR construction. When V is realized as schwa next to a CVC root realized, as in (2d), it never surfaces as stressed. The VDIR, however, when realized as schwa can surface with stress, as in (8d).

Note that the VDIR only occurs when it is the second V in a CVCV sequence. It does not occur when the root/stem is longer than CVC (and hence not in a CVCCV sequence). In transitive constructions with a VDIR root plus lexical suffix, the predicate surfaces with the DIR instead of the VDIR. Compare the following two VDIR roots. The (a) examples show the VDIR root with the VDIR. The (b) examples show the VDIR root but with the lexical suffix *-kw* ‘head’, and now with the DIR instead.

- (9) a. kw’ukw-u-t
 beat-VDIR-TR
 ‘to hit (someone) with a stick’
- b. kw’ukw-kw-á-n
 beat-head-V-DIR
 ‘the hit (someone) on the head, with a stick’

- (10)a. lhich’-i-t
 cut-VDIR-TR
 ‘to cut (something)’
- b. lhich’-ilhxa7-n
 cut-neck-DIR
 ‘to cut (someone’s) neck’

3.1.2 Intransitives

For intransitives, phonemic vowel harmony occurs with CVC roots with the intransitivizer *-m* (§3.1.2.1), a small set of CV7 roots

(§3.1.2.2), diminutives (§3.1.2.3) and a few other miscellaneous intransitives (§3.1.2.4).

3.1.2.1 Intransitives with *-m*

Kuipers (1967:81,§111) describes phonemic vowel harmony for a set of intransitives. This small set of intransitive verbs are comprised of a CVC root and the intransitivizer *-m*. Intervening between the root and suffix is a copy vowel of the root's vowel.

- | | | | |
|--------|---------|-------------|-----------------------------------|
| (11)a. | √nich | ních-i-m | ‘to speak’ |
| b. | √xwit | xwít-i-m | ‘to jump’ |
| c. | √xín | xín-i-m | ‘to growl’ |
| d. | √ts’ulh | ts’úlh-u-m | ‘to feel cold’ |
| e. | √shukw’ | shúk’w’-u-m | ‘to bathe oneself’ |
| f. | √xwuy | xwúy-u-m | ‘to sell’ |
| g. | √tsaxw | tsáxw-a-m | ‘to reach out, to stick hand out’ |
| h. | √yákw’ | yák’w’-a-m | ‘to sweat’ |

As with unstressed vowels elsewhere in the grammar, the unstressed copy vowel can be reduced to schwa, and often is with these verbs. Note that as with all other cases of copy vowels, the copy vowel occurs as an unstressed second V of a CVCV sequence.

3.1.2.2 CV7 intransitives

In Skwxwú7mesh, there are a few CVC roots with glottal stop for their second C (henceforth, CV7 roots). When these CV7 roots occur as bare roots (that is, they are unaffixed), then, and only then, do they occur with a copy vowel of the root vowel. For example:

- (12) lhá7a
‘to approach’

- (13) tá7a
‘to happen’

However, when these roots have a transitivizer, there is no copy vowel:

- (14)a. **lha7-n**
touch-DIR
'to approach, to touch'
- b. ***lha7an**
- (15)a. **ta7-s**
do-CAUS
'to make, to do'
- b. ***ta7a-s**
- c. **tá7-n-exw**
do-DIR-3OBJ
'to have made, to have done'
- d. ***ta7a-n-exw**

The following CV7 roots only occur as bare roots in my database. They also have a copy of the root vowel.

- (16)a. **k'á7a**
'to get hung up'
- b. **tl'ú7u**
'to rest after pain'

There appears to be a special case with the following root:

- (17) **√wa7**

When it occurs as an intransitive predicate it seems to exhibit a type of reduplication.

- (18)a. **wá7-ew**
'to continue on with; to keep'
- b. **na men wá7ew lhákw'-a-n-t-s-as**
RL just continue slap-V-DIR-TR-1S.OBJ-3SUBJ
'She kept slapping me.'

Importantly for our discussion here, when this root occurs as an interjection, it has a copy vowel of the root vowel.

- (19) **wá7a!**
 ‘(interjection indicating exasperation), good heavens!’

Note that as with all other cases of copy vowels, the copy vowel occurs as the second V of a CVCV sequence. Shaw et al (1999) describe a similar type of translaryngeal vowel harmony occurring in Xwmetskwíyaḿ (Musqueam Halkomelem).

3.1.2.3 Diminutives

Vowel harmony is also found with diminutive reduplication in Sḵwḵwu7mesh. Diminutives in Sḵwḵwu7mesh are formed by a special type of reduplication that largely occurs with nouns. The process appears to be unproductive for contemporary speakers, but was active until fairly recently, given that a number of recorded diminutive forms are built on loan words.

When there is vowel harmony with the diminutive, the first vowel of the root harmonizes with the vowel of the diminutive reduplicant.⁶ The diminutive reduplicant is comprised of a copy of the first consonant of the root C-, followed by the sequence *-i(7)*, followed by the root itself.

- (20) Diminutive in Squamish
C₁i(7)-C₁VC

The following are some examples where vowel harmony does not occur between the diminutive reduplicant and the root’s vowel. The diminutive reduplicant and the first vowel of the root (when it surfaces) are in bold.

- (21) No vowel harmony
- | | <u>Base form</u> | | <u>Diminutive</u> | |
|----|------------------|-------|-----------------------|--------------|
| a. | lam | house | lí7-lam | little house |
| b. | lhach ’tn | knife | lhí7-lhach ’tn | little knife |

⁶ Stress appears to be somewhat variable for the diminutives. For many forms stress is realized on the reduplicant. But for some forms, it occurs on the root or it seems to be in free variation between the reduplicant and the root. I note any variation and leave this issue for future research.

c.	slhawín	bed	s-lhí7-lhawín	little bed
d.	s-mant	rock	s-mí7-mant	little rock (or, pebble)
e.	s-ts'á7kin	bullrush	s-ts'í-ts'a7kin	little bullrush
f.	?kwelh	to be split	kwí7-kwelh	small (type of) canoe
g.	mék₂sen	nose	mí7-mek₂sen	little nose
h.	shéway	to grow	shí7-sheway	twig
i.	xep'	to crack	xí7-xp'	to smash the shell of a little neck clam on a rock [in order to eat it raw]
j.	yulh	to burn	yí7-yulh	a fire, firewood, to burn, to have a burning
k.	s-kwekwiyíntsut	actions	s-kwi-kwekwiyíntsut	small actions

This next set of data provides examples of vowel harmony between the reduplicant's vowel and the root's vowel. This appears to be a classic case of reduplicative back-copying. Again the reduplicant and the first vowel of the root are in bold.

(22) Vowel Harmony (of reduplicant's vowel)

	<u>Base form</u>		<u>Diminutive</u>	
a.	s-kwemáy	dog	s-kwí7-kwimáy	little (type of) dog
b.	s-kw'shétsut	toy	s-kw'í7-kw'ishetsut	little toy
c.	s-k'émel	paddle	s-k'í7-k'imel	little paddle
d.	latám	table	lí7-litam	little table

e.	s-tl'álk _{em}	monster	s-tl'i-tl'ílk _{em}	bug (=little monster)
f.	nexw-lám-ay'	bottle	nexw-lí7-limáy'	little bottle
g.	ts'naý'	bullhead	ts'í-ts'ináý'	little bullhead
h.	tsawín	coho	tsí7-tsa _w in tsi7-tsá _w in	small coho
i.	s-nexwílh	canoe	s-ní7-nixwilh	toy canoe

I have found one other sub-type of vowel harmony with the diminutives. With this small set of words, both vowels can harmonize with the diminutive's vowel, *or* with the root's vowel. In none of these forms are the vowels different. Three of the four forms also have the expected *i*7 form for the reduplicant.

(23)	Vowel harmony (variable)		
	Base form		Diminutive
a.	p'ák _w ilh	to launch a canoe	p'í-p'ík _w ilh p'á-p'ák _w ilh
b.	kw'áxwa7	box	kw'í-kw'ixwa7 kw'á-kw'xwa7
c.	xápaýay	cedar tree	xí7-xípaý-ay xe-xepáý-ay
d.	kw'eyúkw	a hook	kw'e-kw'eyúkw

The first example in (23a) provides the clearest case of this subtype. Either the root's vowel harmonizes with the reduplicant or vice versa. In (23b) the root's initial vowel harmonizes with the reduplicant, or the reduplicant's vowel harmonizes with the underlying initial vowel of the root. The root's initial vowel is then deleted. In (23c), again either the root's vowel harmonizes with the reduplicant or vice versa. In this case, though, the movement of stress to the penultimate syllable causes schwa reduction in the first two vowels of the root. It is this schwa that the reduplicant harmonizes with (making this form look formally identical to

CV- reduplication). The form in (23d) has not been found with the expected Ci7 reduplicant form.⁷

In all those cases where vowel harmony does occur with the diminutives, both vowels are part of the initial CVCV in the word, not including the prefixes. Again, vowel harmony occurs in the environment of a CVCV sequence.

3.1.2.4 Miscellaneous intransitives

I have one other possible example with an intransitive verb without an overt transitivizer which appears to exhibit vowel harmony, at least for some speakers. This word varies in pronunciation between the low vowel and the front vowel. The sequence *a7* is probably derived from *e7*, but schwa never appears before a glottal stop. It gets lowered to *a7* instead.

(24) tʰíya7 ~ tʰíyi7
‘to stop’

Kuipers (1967) analyzes this word as having the inchoative suffix *-i7*, in which case the *a7* realization is just a case of schwa reduction.

(25) tʰey-i7
stop-INCH

One reason to think that this may not be correct is that not all speakers recognize the *tʰíyi7* pronunciation, but all do recognize the *tʰíya7* pronunciation.

I also have one numeral, which for some speakers’ pronunciation, appears to have vowel harmony. The numeral ‘five’ has two different pronunciations. The second vowel can either be an /a/ or it can harmonize (to the first vowel) and surface as /i/.

(26) tsíyachis ~ tsíyichis
‘five’

The numeral ‘five’ has the suffix *-achis* which historically was the lexical suffix for ‘hand’. The contemporary lexical suffix is just *-ach* ‘hand’.

⁷ Note that in the practical orthography, the schwa of the root is written as /i/, but that is meant to represent the allophone [i] for schwa when it is pretonic before the glide [j].

Note for both *tl'iyi7* and for *tsiyichis* that vowel harmony occurs in a CVCV environment: *tl'iyi* and *tsiyi* respectively.

3.1.3 Vowel harmony in the nominal domain

In this section I look at one noun and one nominal lexical suffix.

Except for diminutive reduplication, phonemic vowel harmony is not found in any other systematic fashion in the nominal domain. I have one possible case, of what is probably allophonic variation for schwa, with one nominal root. The following noun has two different pronunciations. The unstressed vowel can be realized as either a schwa (27a) or as a copy of a stressed vowel (27b). Thus the unstressed vowel could be said to be harmonizing with the stressed vowel in (27b).

(27)a. *kwe7úp* [qʷʌʔóp]
 'crabapple'

b. *kwu7úp* [qʷoʔóp]
 'crabapple'

One problem for analyzing this as vowel harmony, though, is that schwa already has [o] as one of its allophones in the environment of a rounded consonant. Comparative data with other Salish languages could help resolve whether the unstressed /u/ is an underlying vowel or just an allophone of schwa.

A clearer case of phonemic vowel harmony presents itself with one transitive verb, wherein the initial vowel of the lexical suffix harmonizes with the root's vowel. The initial vowel of this suffix is /a/ as in (28a). Normally, this vowel surfaces as either /a/ or schwa, depending on factors relating to stress (28b). But, in (28c) the initial vowel of the suffix harmonizes with the root's vowel.

(28)a. *-alh̥a*
 'neck, throat'

b. *tsik-alh̥á7-n*
 stab-neck-DIR
 'to stab (someone) in the throat'

c. *lhich'-ilh̥á7-n*
 cut-neck-DIR
 'to cut (someone's) neck'

The fact that by far the majority of words that contain this suffix surface with either an initial /a/ or schwa indicates that this harmonization is not regular. It does raise the question, though, of how regular this process of vowel harmonization was for some speakers. It is quite possible that there are more words where this process took place for some speakers. In my recording of some words which actually had /i/, I may have mistakenly recorded them as schwa since schwa has the allophone [ɪ].

As far as syllable shape with nouns is concerned, vowel harmony again occurs in a CVCV environment: *k̲wu7ú* and *lhich'i*. Harmonization appears to be leftward with the noun *k̲wu7úp*.

3.1.4 Aspectual clitics

Phonemic vowel harmony is also found with two different aspectual clitics, *na* ‘realis’ and *wa* ‘imperfective’, but only when they occur in a nominalized clause.⁸ Their vowel, /a/, harmonizes with the vowel of the preceding complementizer/determiner *kwi*. In a nominalized clause these aspectual clitics often occur in a reduced form.

When *na* occurs between the nominalizer *s-* and the third person possessive *-s*, it can have three different surface realizations. Rarely, it will surface with the full vowel (29a). Commonly, it will surface with its vowel reduced to schwa (29b) or simply as a schwa (29c).

(29)a.	Full form of the clitic kwi s-na-s DET NOM-RL-3POSS	Phonetic realization [kʷi snas]
b.	Partially reduced form of the clitic kwi s-ne-s DET NOM-RL-3POSS	[kʷi snəs]
c.	Fully reduced form of the clitic kwi s-e-s DET NOM-RL-3POSS	[kʷi səs]

⁸ Nominalized clauses function as: i) complement clauses, ii) adverbial clauses or iii) purpose clauses (Jacobs 1992). The following example shows a nominalized clause as complement:

chen ta7áwn kwi s-e-s nam̲ huyá7
I think DET NOM-RL-3POSS go leave
'I think that he left.'

The partially reduced form (29b) can also alternatively be realized with the clitic's vowel harmonized to the vowel of the determiner as in (30a). The fully reduced form can also alternatively be realized with the clitic's vowel harmonized to the vowel of the determiner as in (30b).

- (30) Vowel harmony with reduced clitics
- | | |
|---|------------------------|
| a. Partially reduced form of the clitic | Phonetic realization |
| kwi s-ni-s | [k ^{wi} snis] |
| | |
| b. Fully reduced form of the clitic | |
| kwi s-i-s | [k ^{wi} sis] |

The same vowel harmonization can occur with the clitic *wa* 'imperfective' in the identical environment, i.e. when it is preceded by the nominalizer *s-* and immediately followed by the third person possessive *-s*. The full form of the clitic does not usually surface as such (31a). Instead it either surfaces with its vowel reduced to schwa (31b) or just with the vocalized version of its /w/ onset, i.e. it surfaces as /u/ (31c).

- | | |
|---|-------------------------|
| (31)a. Full form of the clitic | Phonetic realization |
| kwi s-wa-s | [k ^{wi} swas] |
| DET NOM-IMPf-3POSS | |
| | |
| b. Partially reduced form of the clitic | |
| kwi s-we-s | [k ^{wi} swə̃s] |
| DET NOM-IMPf-3POSS | |
| | |
| c. Fully reduced form of the clitic | |
| kwi s-u-s | [k ^{wi} sos] |
| DET NOM-IMPf-3POSS | |

The partially reduced form (31b) can also alternatively be realized with the clitic's vowel harmonized to the vowel of the determiner as in (32).

- | | |
|---|------------------------|
| (32) Partially reduced form of the clitic | Phonetic realization |
| kwi s-wi-s | [k ^{wi} swis] |

With these clitics, vowel harmony is not always taking place in a CVCV environment within the same word, unlike all the other cases that we have examined. Furthermore, it is taking place from clitic to following clitic.

- | | | | |
|----|--------------|----------|----------------|
| | tímin | [té·min] | ‘muscle’ |
| c. | [e]
síten | [sé·tɨ] | ‘berry basket’ |
- (35)
- | | | | |
|----|-------------------------|------------------------|-------------------------|
| a. | [u]
shusháw | [šušáwʔ] | ‘bones’ |
| b. | [o]
múmten
sút’un | [mómʔtən]
[só·t’on] | ‘grouse’
‘to inhale’ |
- (36)
- | | | | |
|----|---------------|----------|---------------|
| a. | [æ]
míxalh | [mé·χæʔ] | ‘black bear’ |
| b. | [a]
táʔa | [táʔa] | ‘mom, granny’ |

3.2.2 Allophonic vowel harmony in CV- reduplication

Kuipers (1967:26-27,§12) describes cases of what I here call allophonic vowel harmony. All of the cases involve CV- reduplication. Kuipers only provides one example, so I provide here two more. All of these examples involve the front vowel /i/ and its two allophones [e] and [ɛ].

- | | | | |
|--------|--------------|---------------|---------------|
| (37)a. | tl’ítl’ixway | [ɬ’é·ɬ’ɛχʷay] | [ɬ’é·ɬ’eχʷɛy] |
| b. | sí-sik | [sé·sɛq] | [sé·seq] |
| c. | ts’í-ts’ik | [c’é·c’ɛq] | [c’é·c’eq] |

In the first set of phonetic realization in (37b-c), the two vowels surface as expected given the above description in the previous section. The first vowel is realized by the mid-front allophone [e] and the second vowel, due to the immediately following uvular, is realized as the low front allophone [ɛ]. In the second set of phonetic realizations in (37a-c) the first vowel harmonizes to the second vowel’s allophonic realization as [ɛ], instead of its expected realization as [e]. In the third set of phonetic realizations in (37a-c), the second vowel harmonizes to the first vowel’s allophonic realization as [e], instead of its expected realization as [ɛ].

Allophonic vowel harmony with these cases occurs in a CVCV environment similar to most of our cases of phonemic vowel harmony. Unlike most previous examples, though, vowel harmony appears to spread either rightward or leftward with no apparent preference.

3.2.3 Allophonic vowel harmony with nouns

As with phonemic vowel harmony in the nominal domain, allophonic vowel harmonization does not appear to be active in the nominal domain. I have one possible case with the adverbial DP *ti stsi7s* ‘today’ in which the noun’s vowel appears to be harmonizing with the vowel quality of the determiner. Both vowels are phonemically /i/. For some speakers, they can both be realized by the high front vowel [i]. This allophone is normally reserved for some unstressed environments, such as the determiner. The vowel of the head of the phrase, *stsi7s*, is expected to be realized as a stressed [é], since in *Skw̄x̄wu7mesh* every phrase has to have at least one vowel with stress, and this is normally the head noun in the DP.

- (38) **ti** **s-tsi7-s** [ti stséʔs] ~ [ti stsíʔs]
 DET NOM-exist-3POSS
 ‘today’

As with phonemic vowel harmony, there is only one putative case of allophonic vowel harmony with nouns. I assume, therefore, that allophonic vowel harmony is not an active process with nouns. As far as syllabic environment, vowel harmony in (38) does not occur in a CVCV environment as with the majority of cases. It is similar, however, to some of the cases with the aspectual clitics.

3.3 Summary on vowel harmony

In this section vowel harmony was examined, both as phonemic vowel harmony and allophonic vowel harmony. The following are summaries of the findings for phonemic vowel harmony and for allophonic vowel harmony.

- | | | |
|------|---|----------------|
| (39) | <u>Domains for phonemic vowel harmony</u> | <u>Example</u> |
| a. | the Directive construction: | yúts'-u-n |
| b. | the V Directive construction: | ch'áw-a-t |
| c. | the -m intransitivizer: | xwít-i-m |

d. diminutives:	lí7-litam
e. CV7 bare roots:	lhá7a
f. miscellaneous intransitives	tl'íyi7
g. aspectual clitics:	kwi s-i-s
h. one possible noun:	kwu7úp
(40) <u>Domains for allophonic vowel harmony</u>	
a. CV- reduplication	tl'ítl'ík
b. one possible DP	ti stsi7s

Dyck (2004) only examines vowel harmony for the DIR and for the VDIR constructions. The data provided in this section demonstrates that vowel harmony occurs in a wider range of constructions. In most cases vowel harmony occurs in a CVCV environment. Only the diminutives, the one possible noun kwu7úp and the CV- forms appear to optionally have vowel harmony spreading leftward from the second vowel. The paucity of examples in the nominal domain, except for the diminutives, seems to indicate that vowel harmony is not an active process in this domain.

4 Schwa-/á/ alternations

In this section I examine phonological processes in Skwxwu7mesh which involve schwa alternating with /a/. In many of these cases schwa is expected to surface but instead a stressed /á/ surfaces. We find this alternation with some CVC reduplicants, with the intransitivizer -m, with some transitive/intransitive pairs, and finally with subject clitics. I will examine each of these in turn.

4.1 Schwa-/á/ alternations with CVC- reduplication

The first schwa-/á/ alternation I examine is that which occurs with some CVC- reduplicants. I first provide some examples which do not have this alternation. In the examples in (41), the root has a full vowel, but the CVC reduplicant has an unstressed schwa. In the examples in (42), the root has a schwa, and the reduplicant again has an unstressed schwa.

- (41) **Full vowel roots**
- | | |
|---|---|
| <p>Non-reduplicated</p> <p>a. kw'ách-n-exw
see-DIR-3OBJ
'to see (something)'</p> <p>b. xwít-i-m
jump-V-INTR
'to jump'</p> <p>c. ts'úp'-n-e'was-n
connect-DIR-LCRECIP-DIR

'to connect (sticks) together'</p> | <p>Reduplicated</p> <p>kw'ech-kw'ách-n-exw
RED-see-DIR-3OBJ
'to see (a group)'</p> <p>xwet-xwít-i-m
RED-jump-V-INTR
'to be skipping'</p> <p>ts'ep'-ts'úp'-n-e'was-n
RED-connect-DIR
-LCRECIP-DIR
'to connect (sticks) end
-to-end'</p> |
|---|---|
- (42) **Schwa based roots**
- | | |
|--|---|
| <p>Non-reduplicated</p> <p>a. éxwu7n
cough
'to cough'</p> <p>b. kwélash-t
shoot-TR
'to shoot (something)'</p> <p>c. xewtl'-á-n
break-V-DIR
'to break (something)'</p> <p>d. xéch-n-exw
remember-DIR-3OBJ
'to think of (something)'</p> | <p>Reduplicated</p> <p>7exw-7éxwu7n
RED-cough
'to cough all the time'</p> <p>kwel-kwélash-t
RED-shoot-TR
'to shoot (something)
continuously'</p> <p>xew-xewtl'-á-n
RED-break-V-DIR
'to break (a pile of things)'</p> <p>xéch-xech-s
RED-remember-CAUS
'to remember (something)'</p> |
|--|---|

In all the examples so far, the reduplicant surfaces with a schwa for its vowel, regardless of the vowel of the base. This schwa, except for (42d), is unstressed.

Now compare the above examples in (41) and (42) to the following examples, in (43) and (44), where the reduplicant has, given our pattern above, an unexpected stressed /á/. The reduplicated element is in bold. Stress is written as it was indicated either in Kuipers (1967, 1969) or as I found it written in the unpublished collections at the

Squamish Nation. They represent all the known tokens of this subtype of reduplication.

(43)	Schwa based roots	
	Non-reduplicated	Reduplicated
a.	sheych'á-n-t-sut around-V-DIR-TR-CREFL 'to turn oneself around'	sháy'sheych'á-n-t-sut Red-around-V-DIR-TR-CREFL 'to be spinning around'
b.	nexw-yelx-áy LOC-search-place 'to look around searching'	nexw-yáí-yelx-áy LOC-RED-search-place 'to look around searching'
c.	welkw'áls sk 'to ask'	wáí-welkw'áls RED-ask 'to ask around'
d.	lep̄w-á-n-t-sut noise-V-DIR-TR-CREFL 'to make noise'	láp-lep̄w-á-n-t-sut RED-noise-V-DIR-TR-CREFL 'a group is making noise'
e.	tsexw-s get hit-CAUS 'to throw (something)'	tsáxw-tsexw-s-t-énamut RED-get.hit-CAUS-TR -CAUS.REFL 'to throw oneself around (i.e. tossing and turning while sleeping)'
f.	?lhek̄'el ⁹	lhák'-lhek̄'eléímen 'to make inquiries'
g.	tskw'á-t-sut stretch?-VDIR-TR-CREFL 'to run'	tsákw'-tskw'á-t-sut RED- stretch?-VDIR-TR -CREFL 'to run around'
h.	t̄xw-áyaní7-m correct-ear-INTR 'to make sure'	táxw-t̄xw-aya7ni7-m RED-correct-ear-INTR 'to make sure of the news'

⁹ The root appears to be lhek̄'el the /-form of the verb lh̄k̄'i7-s or lh̄k̄'ey's 'to know'. The suffix -əlmən/-əlmən is the desiderative in other Coast Salish languages (cf. Stultes 2004:261-2, §11.2.1 and Gerds 1991 for Downriver and Island Halkomelem, respectively).

- | | | |
|------------------------------|--|--|
| i. | ḵexw
gathered
'to be gathered together' | es-ḵáxw-ḵexw
STAT-RED-gathered
'to be in groups (e.g. people
in the longhouse)' |
| (44) Full vowel + glide root | | |
| | Non-reduplicated | Reduplicated |
| a. | múy-u-n
submerge-V-DIR
'to submerge (something)' | máy-múy-u-n
RED-submerge-V-DIR
'to submerge (something)
repeatedly' |
| b. | múy-u-n-t-sut
submerge-V-DIR-TR-CREFL

'to submerge oneself' | máy-múy-u-n-t-sut
RED-submerge-V-DIR-TR
-CREFL
'to submerge (something)
repeatedly' |

The initial vowels of the base form (in bold) are schwa in all the examples in (43). In examples (43g,h), the schwa is elided. In the examples in (44), the root does not have schwa, but instead has /u/. Furthermore, it has a glide [j] for its coda.

In all these examples there are two stresses per word. One stress falls on the reduplicant and another, second stress falls closer to the end of the word. A note is in order about secondary stress. Kuipers (1967:23,§2) states that words may have two stresses. Of the two stresses, the right stress is the more prominent one, or in his terms the “stress closest to the end of the word is ... facultative”. None of the words in (43) and (44) have been checked for secondary stress and, in fact, no studies have been done on Sḵwḵwu7mesh stress to determine what the correlates of secondary stress are compared to primary stress. Following Kuipers (1967:23,§2), I will assume that the rightmost stress has primary stress. Note that with this analysis, the reduplicant carries secondary stress and primary stress falls towards the end of the word, except for (45i), which carries the primary and only stress.

- (45)a. shàýsheych'ántsut
- b. nexwyàiyelḵáy
- c. wàíwelḵw'áls

- d. l̥ap̥lep̥x̥w̥ánt̥sut
 - e. ts̥àx̥wt̥sex̥w̥st̥én̥am̥'ut
 - f. lh̥àk̥'l̥hek̥'el̥é̥l̥m̥en
 - g. ts̥àkw̥'tskw̥'átsut
 - h. t̥àx̥wt̥x̥w̥aya7n̥í7m
 - i. esk̥áx̥w̥k̥ex̥w
- (46)a. mḁ̀y̥m̥ú̥yun
- b. mḁ̀y̥m̥ú̥y̥untsut

I have also recorded example (45a) with an unstressed schwa glide combination which gets vocalized:

- (47) shey-sheych'ánt̥sut ----> shi-shich'ánt̥sut

To summarize the findings from these data on CVC- reduplicants:

- i. the vowel of the reduplicant is normally an unstressed schwa, regardless of whether the base has a full vowel or schwa, as in (41)0 and (42).
- ii. in some forms, though, the vowel of the reduplicant is realized as the low vowel /a/ instead of the expected /e/, as in (43) and (44).
- iii. furthermore, this low vowel seems to correlate with secondary stress /à/, as in (45) and (46)
- iv. for most of these forms, the root that the reduplicated forms is derived from is schwa-based (43), except for the two examples in (44).
- v. at least for one form, it appears that the these /á/ forms can alternatively surface with an unstressed schwa (47)0.

4.2 Schwa-/á/ alternations with –m

The vowel before the intransitivizer –*m* also surfaces with a stressed /á/ before it in some cases and a schwa in other cases. This pattern is reminiscent of the pattern of stressed /á/ before the DIR –*n*. I will, therefore, call this vowel V. In all the following examples, stress has shifted because of the subject clitic following the verb.

- (48)a. **chay-ak-á-m** **chexw**
 follow-?-V-INTR 2.SUB
 ‘Follow (me)!’
- b. **míkw’-shn-á-m** **chen**
 wash-foot-V-INTR 1S.SUB
 ‘I’m going to wash my feet.’

However, when the vowel before the –*m* is not stressed it is realized as a schwa. Compare the following examples in (49) to the ones in (48). The main difference is the placement of the subject clitic resulting in a change in primary stress.

- (49)a. **chen** **chá-y-ak-e-m**
 1S.SUB follow-?-V-INTR
 ‘I followed.’
- b. **chen** **míkw’-shn-e-m**
 1S.SUB wash-foot-V-INTR
 ‘I washed my feet.’

Compare the above examples in (48) and (49), with the lexical suffix present, to the following examples in (50a-b). Recall that V with the DIR also surfaced either as a stressed /á/ or as an unstressed schwa (§2.3), depending on where stress falls (examples (6a-b) repeated here as (50a-b)). If stress falls on the root, then V is realized as schwa (50a). If stress falls on the syllable with the Directive, then V is realized as /á/ (50b).

- (50)a. **chen** **xíts-k-e-n-(t)-Ø** **ta** **stsek**
 1S.SUB lay-bottom-V- DIR-TR-3OBJ DET tree
 ‘I fell a tree.’ (Kuipers 1967:369)

- b. $\text{xits-k-á-ṇ-(t)-\emptyset}$ chen kwetsi stsek
 lay-bottom-V-DIR-TR-3OBJ 1S.SUB DEM tree
 ‘I’m going to fell a tree.’ (Kuipers 1967:369)

In summary, the V before the intransitivizer *-m*, like V before the DIR, can surface as either /á/ or schwa. This distribution is determined by factors of stress in the sentence for the intransitivizer *-m*, just as it is for the Directive *-n*. If we include the roots from §3.1.2.1, where the vowel before the intransitivizer *-m* harmonizes with the root’s vowel, then we have the exact same distribution for V with the intransitivizer *-m* as we do for V before the Directive transitivizer *-n*.

In summary, the vowel V before *-m*:

- i. surfaces as /á/ when it is stressed
- ii. harmonizes with the vowel of a CVC root when the (in)transitivizer is immediately following.
- iii. surfaces as an unstressed schwa elsewhere.

This distribution is the exact same distribution for V before the DIR.

As with the CVC reduplicant, the realization of V as a stressed /á/ is determined by stress patterns. When stress is required on V, then it is realized as /á/, otherwise it surfaces as schwa, except when it is contiguous to a CVC root, then it harmonizes with the root vowel.

4.3 Schwa-/a/ alternations with person clitics

S kwxwu7mesh has schwa-/á/ alternations with subject clitics and in one case with one possessive suffix.

In matrix clauses, S kwxwu7mesh has subject clitics for first and second person, both singular and plural. Except for second person plural, these clitics have both a schwa form and a form with /á/. The /á/ form surfaces with a sentence level stress while the schwa forms do not.¹⁰ The second person plural forms, however, can surface with sentence level stress or not.

¹⁰ Sentence level stress is not normally indicated in S kwxwu7mesh orthography, but I indicate it here for sake of the discussion in this section.

	Singular	Plural
1 st	chen chán	chet chát
2 nd	chexw cháxw	cháp, cháyp

Table 2: Subject clitics in Sḵwḵwu7mesh

Kuipers (1967:86,§125) analyzes these subject clitics as consisting of a clitic *ch-* ‘to do’ followed by the subject suffix.¹¹ For Kuipers, the subject suffix underlyingly has the full vowel /a/ but this vowel is reduced when it is unstressed. One reason to consider that the difference between the two types of subject clitics is not just stress-related is their different distributions. The two types of clitics are not freely interchangeable in most environments.

A very common way for the stressed subject clitics to surface is in affirmative answers to yes/no questions, such as:

- (51)a. **n-u chexw íhen.**
 RL-Y/N 2S.SUB eat
 ‘Did you eat?’
- b. **na chán.**
 RL 1S.SUB
 ‘I did.’
- c. **chan.**
 1S.SUB
 ‘I did.’

¹¹ Other forms with this root include:

- | | | |
|-----------------------|----------------------------------|---------------|
| i. chá-nem | ‘do what?’, ‘go where?’ | (do-?) |
| ii. chá-s | ‘do what with (it)?’ | (do-CAUS) |
| iii. chá7-t | ‘to make (it)’ | (do-TR) |
| iv. chá-shi-t | ‘to do what with for (someone)?’ | (do-REDIR-TR) |
| v. chá7-t-wilh | ‘to build a canoe’ | (do-TR) |

A yes/no question can also be answered affirmatively with the unstressed subject clitic, but normally only if the realis clitic *na* is also present (52a), not if *na* is absent (52b).¹²

(52)a. **na chen**
RL 1S.SUB
'I did.'

b. ***chen**
1S.SUB
'I did.'

Another distributional difference is that stressed subject clitics are strongly dispreferred when a full VP is present. When a sentence with the stressed subject clitic is offered in elicitation, such as (53a), a sentence with an unstressed subject clitic is offered instead, such as (53b). In out of the blue context, though, a sentence without the realis clitic is typically offered like in (53c).

(53)a. **#na chán wa ts'its'áp'**
RL 1S.SUB IMPF work

b. **na chen wa ts'its'áp'**
RL 1S.SUB IMPF work
'I was working.'

c. **chen wa ts'its'áp'**
1S.SUB IMPF work
'I was working.'

Another feature of the subject clitics is that, unlike pronouns in English, they cannot be used to create contrastive focus with the person of the subject. This is true even if the subject clitic is stressed. As in Salish in general, such contrastive focus is encoded with the independent pronouns.

(54)a. ***chán wa lulum.**
1S.SUB IMPF sing
'I am the one singing.'

¹² This is true for most speakers. I recently found a recording of one speaker who appears to allow *chen* by itself in answer to a yes/no question.

- b. **énts na wa lúlum.**
 1S.INDP RL IMPF sing
 ‘I am the one singing (not him),’
 ‘I am singing (not him).’

The independent pronoun in (54b) carries sentence level stress (which is not normally written in the practical orthography). It is also in a focus position at the front of the sentence with a following relative clause. Contrastive focus can only be expressed with the independent pronoun in *Sḱwḱwu7mesh*.

These distributional differences provide strong evidence that the distribution of subject clitics is not only determined by stress as Kuipers (1969) suggests; rather, the choice of a stressed subject clitic over an unstressed one must be influenced by other grammatical factors, i.e. from semantics, syntax or discourse/pragmatics. A fuller understanding of the role of stress in *Sḱwḱwu7mesh* is required to better understand what these factors are. I offer one observation here. Whatever the grammatical motivation for stressing subject clitics is, the phonological strategy for expressing this stress also includes changing the vowel from schwa to a stressed /á/.

Kuipers (1967:87) also provides one other example of a person clitic being realized with a stressed /á/ when normally it would be realized with a schwa: the first person plural possessive clitic in a nominalized clause. This is in the nominalized clause as also noted by Dyck (2004:324). Note the first person plural possessive affix which marks the subject of the nominalized clause is realized by schwa in (55a), but by stressed /á/ in (55b). This is the only environment where the vowel of this clitic is ever realized by a stressed /á/.

- (55)a. **kwi-s ch’áw-a-t-umi-chet**
 DET-NOM help-VDIR-TR-2S.OBJ-1PL.POSS
 ‘our helping you (sg)’ = that we help you (sg)

- b. **kwi-s ch’áw-a-t-umi-chát-wit**
 DET-NOM help-VDIR-TR-2S.OBJ-1PL.POSS-PL
 ‘our helping you (pl)’ = that we help you (pl)

Dyck (2004) notes that the stress pattern in (55b) falls out straightforwardly for stress in *Sḱwḱwu7mesh*. Every second vowel after the stressed vowel in the root receives stress, unless that vowel is in the final syllable, although her analysis does not explain the lack of stress on the third syllable *tum* (56a-b). Thus we obtain the following stress patterns according to her analysis (nb. foot internal resonants are

ambisyllabic; feet are trochaic). Assuming that the rightmost stress is the primary stress, we obtain the following parsing:

- (56)a. (ch'áw.wa)(tum.mi)chet
 b. (ch'áw.wa)(tum.mi)(chát)(wit)

In (56a), the possessive clitic cannot receive stress (primary or secondary) because it is word final. The same possessive in (56b), though, can and does receive stress. Its syllable heads the foot and is therefore eligible for stress. Important to our discussion in this section, then, is that when an element which is normally realized by schwa surfaces with stress, then it can instead be realized by a stressed /á/ instead of its normal schwa. In this case, differently than with the subject clitics, this change in vowel quality appears to be only conditioned by factors relating to stress. Furthermore, the underlying vowel of the possessive is clearly a schwa.

In summary, for Skw̥wu7mesh person markers:

- i. the subject clitics can surface with either schwa or a stressed /á/ (Table 2),
- ii. one of the possessives, which normally surfaces with schwa, can surface with á/ (in a nominalized clause) (55),
- iii. for the subject clitics, this alternation appears to be conditioned by factors other than just phonological stress (i.e. semantics, syntax, discourse/pragmatics) as shown in (51) to (54),
- iv. for the one possessive clitic, this alternation appears to be conditioned solely by factors relating to stress. Its underlying vowel is schwa and it changes to stressed /á/ only when under stress (55).

4.4 Summary of schwa-/á/ alternations

In this section four different types of schwa-/á/ alternations were examined. The following table provides a summary of the findings.

Alternation	Example	Conditioning Factor for /á/
a. some CVC-Reduplicants	sháy- sheych'ántsut	Stress (secondary)
b. V before <i>-m</i>	mikw'-shn-á-m' mík'w'-shn-e-m	Stress (primary)
c. subject clitics	chen chán	Semantics, syntax, discourse-pragmatics
d. possessive suffix	-chet -chát	Stress (primary)

Table 3: Schwa-/á/ alternations

Of the four instances of schwa-/á/ alternations, three of them (CVC-reduplicants, V before *-m*, first person plural possessive) appear to be solely conditioned by phonological factors relating to stress. The distribution of the subject clitics, however, appears to be determined by semantic, syntactic or discourse/pragmatic factors. That is, stress and vowel quality for the subject clitics appear to be controlled by these other factors.

5 Analysis

In this section I present a brief analysis of the vowel harmony cases that we have seen in *Skw̥w̥w̥mesh* and some preliminary observations about schwa strengthening. In short, I propose that vowel harmony, for the majority of cases in *Skw̥w̥w̥mesh*, occurs between two vowels in the same foot. This account is an extension of Dyck's (2004) account for V as a copy vowel (2004). I, then, make the observation that schwa strengthening correlates with stress.

5.1 Vowel harmony

In this section I argue from the data in §3 that vowel harmony is an active process in Squamish, wider than just for the transitivizers. I further argue that since it is a general process in the language, that an account confining it to just the transitivizers is too restrictive, contra Dyck (2004). I begin by examining Dyck's (2004) OT account for the DIR and VDIR transitive construction. She proposes a vowel harmony account but explicitly stipulates that this account is only applicable to these two transitive constructions. I then demonstrate that her account can readily be extended to all the other cases of vowel harmony that we examined in §3, with a couple of possible exceptions.

5.1.1 Phonemic vowel harmony with the transitivizers

Dyck (2004) provides an analysis of the copy vowel with the two transitive constructions: DIR and VDIR. She proposes that the copy vowel phenomenon is a type of vowel harmony that only occurs with these two transitive constructions. In particular, she provides an analysis for vowel harmony as being circumscribed by the prosodic foot.¹³ When the V before the DIR *-n* (57a-d), or the VDIR (58a-d) itself, are parsed in the same prosodic foot as a CVC root, then they surface as a copy of the root's vowel. For example:

- | | | |
|--------|---|-------------|
| (57)a. | sát-a-n
hand.to-V-DIR
'to hand (something) over' | (sá.tan) |
| b. | lhíkw'-i-n
hooked-V-DIR
'to hook (something) | (lhí.kw'in) |
| c. | yúts'-u-n
nudge-V-DIR
'to nudge (someone) | (yú.ts'un) |
| d. | més-e-n
attach-V-DIR
'to attach (something)' | (mé.sen) |
| (58)a. | k'ás-a-t
ask-VDIR-TR
'to ask (someone)' | (k'á.sat) |
| b. | lhích'-i-t
cut-VDIR-TR
'to cut (something)' | (lhí.ch'it) |
| c. | tsúk-w-u-t
squeal-VDIR-TR
'to squeal on (someone)' | (tsú.kwut) |

¹³ Dyck's (2004) account has various prosodic levels. The transitivizers occur in the Prosodic Phrase, or PPhrase.

- d. **kp'‑é-t** (k. p'ét)
 close-VDIR-TR
 'to close (something)'

Dyck (2004) further argues that in all other cases when V does not surface as a copy vowel, it is because V is not parsed in the same foot as the root. In order for V to be parsed in a separate foot, Dyck proposes that CVC is an acceptable (although not optimal) foot in Squamish.¹⁴ Essentially, this proposal prevents (CVC.CVC) from being parsed as a single foot. Instead, such sequences are always parsed as two feet: (CVC)(CVC). Compare the following two examples with the same root.

- (59)a. **tsík-i-n** (tsí.kin)
 stabbed-V-DIR
 'to stab (something/someone)
- b. **tsík-ts-á-n** (tsík)(tsán)
 stabbed-mouth-V-DIR
 'to stab (someone) in the mouth

In example (59a), the CVC root and V are parsed in the same foot, and since it is in the same foot, V harmonizes with the root's vowel. However, in (59b), when the same CVC root has the additional lexical suffix, the root and V are no longer parsed in the same foot. The root is in its own foot and the lexical suffix forms the onset of a second foot with V for its nucleus. Since V is in a separate foot from the root's foot, it does not harmonize with the root's vowel and instead surfaces as a stressed /á/. As noted in §3.1.1, there are no cases of the VDIR with roots other than CVC. Therefore, it is not possible to provide data with the VDIR attached to a root plus lexical suffix.

In summary, Dyck's (2004) proposal says that vowel harmony:

- i. is circumscribed by the prosodic foot,
- ii. only occurs with the two transitive constructions:
 DIR and VDIR,
- iii. the V vowel before the DIR, or the VDIR, harmonizes with the root's vowel, only when they are parsed in the same foot.

¹⁴ This proposal is based on patterns found in the stress system (Dyck 2004).

- iv. acceptable feet in Squamish are: (CV.CVC) or (CVC), but not (CVC.CVC).

I will now demonstrate that these same conditions for vowel harmony are obtained with all the other examples of vowel harmony that we have seen in §3.1.2- §3.2.3. Only vowel harmony with the aspectual clitics and the one putative DP does not follow straightforwardly from this account.

5.1.2 Phonemic vowel harmony with intransitivizers

Dyck's (2004) account of vowel harmony specifically states that the only domain it applies to includes the DIR and the VDIR. She does not examine the *-m* intransitive construction. I first extend her account to the intransitives from §3.1.2.1 with the *-m* intransitivizer showing that this is a natural extension of her account. The V before *-m* harmonizes with the root vowel when they are in the same foot. The following examples are from (11a-d) repeated here as (60a-d).

- | | | |
|-------|---|-------------|
| (60)a | ních-i-m
speak-V-INTR
'to speak' | (ní.chim) |
| b. | xwít-i-m
jump-V-INTR
'to jump' | (xwí.tim) |
| c. | xín-i-m
growl-V-INTR
'to growl' | (xín.7im) |
| d. | ts'úlh-u-m
cold-V-INTR
'to feel cold' | (ts'ú.lhum) |

In every case, V is parsed in the same foot as the root and therefore according to the analysis, it harmonizes with root's vowel.

Recall that the V before the intransitiver *-m* does not harmonize with the root's vowel when a lexical suffix is present. The same analysis can be applied to this concatenation that we applied to the DIR construction with a lexical suffix. The V before *-m* does not harmonize with the root's vowel for the same reason that V before *-n* does not: it is not parsed into the same foot as the root. I repeat here example (48b) as

(61a). Example (61b) provides the parsing for this sentence with the correct vowel /á/. Both V and *-m* are in a separate foot from the root's foot and, therefore, do not harmonize (61c).

(61)a. **mikw'-shn-á-m' chen**
 wash-foot-V-INTR 1S.SUB
 'I'm going to wash my feet.

b. (mikw')(shná'm'.chen)

c. *(mikw')(shní'm'.chen)

This same account applies with the same verb when stress is on the root and not on V (62a). Again, V is parsed in a separate foot from the root, and therefore, it does not harmonize with the root's vowel (62b).

(62)a. **chen m'ikw'-shn-e-m**
 1S.SUB wash-foot-V-INTR
 'I washed my feet.

b. chen(m'ikw')(shnem)

5.1.3 Phonemic vowel harmony with CV7 intransitives

Dyck's (2004) account, I argue, can also be extended to the CV7 roots. Recall that they surface with a copy of the root vowel after the glottal stop when they surface as bare roots (however, we still require an account for why this second vowel appears in this context). As with all other cases of vowel harmony, the second vowel is parsed in the same foot as the root and therefore it harmonizes with the root's vowel. Examples (12) and (13) are repeated here as (63a-b).

(63)a. **lhá7a (lhá.7a)**
 'to approach'

b. **tá7a (tá.7a)**
 'to happen'

5.1.4 Phonemic vowel harmony with the diminutives

Our account can also straightforwardly be applied to the diminutives. With the diminutives, the root's vowel is always parsed in

the same foot as the diminutive reduplicant's vowel (Dyck 2004 proposes that parsing of diminutives starts at the left edge of the diminutive reduplicant). Examples (22a,d) are repeated here as (64a,b).

- (64)a. s-kwí7-kwimay (skwí7.kwim)may
 b. lí7-litam (lí7.li)tam

The diminutives also provide evidence that vowel harmony can optionally spread leftward from the root's vowel to the diminutive reduplicant. Example (23a) is repeated here as (65).

- (65) p'i7-p'akw-wilh
 DIM-float-canoe
 'to play with toy canoes'
- a. p'í-p'ikwilh (p'í.p'i)(kwilh)
 b. p'á-p'akwilh (p'á.p'a)(kwilh)
 c. *p'í-p'akwilh (p'í.p'a)(kwilh)

In (65a) the vowel harmony spreads rightward from the reduplicant's vowel to the root's vowel. In (65b), however, the vowel harmony spreads leftward from the root's vowel to the reduplicant's vowel. Unexplainably, we do not find cases without vowel harmony, such as (65c), at least in the few forms we have where spreading optionally takes place leftward. Regardless, in all cases the domain for vowel harmony is the foot.

5.1.5 Phonemic vowel harmony - miscellaneous

For the two miscellaneous intransitives that appear to have vowel harmony, these two predicates also parse with both vowels in the same foot. Therefore, according to our extended proposal of Dyck's (2004) account, we again have the right environment for vowel harmony. The predicates from examples (24) and (26) are repeated here in (66) and (67).

- (66)a. (tl'íy.ya7) 'to stop'
 b. (tl'íy.yi7)

(67)a. (tsíy.ya)(chis) ‘five’

b. (tsíy.yi)(chis)

While the forms for vowel harmony are not preferred by all speakers, our account provides an explanation for those speakers who do apply vowel harmony here. These forms also provide data indicating that vowel harmony in Ṣkẉx̣wu7mesh extends beyond the two transitivizer types.

For the one case we have of the vowel of a lexical suffix harmonizing with the root’s vowel, when that vowel is parsed, it is also in the same foot as the root. Again, this is the environment where vowel harmony takes place. Example (28c) is repeated here as (68a). Examples (68b-c) show this form parsed. The initial vowel of the lexical suffix is parsed in the same foot as the root and so vowel harmony is permitted (68b). As often happens, though, a pretonic vowel can be reduced to schwa, as in (68c).

(68)a. lhich’-alḥá7-n
cut-neck-DIR
‘to cut (someone’s) neck’

b. (lhi.ch’ilh)(x̣á.7n)

c. (lhi.ch’elh)(x̣á.7n)

Our account also provides the correct environment for vowel harmony for the one noun in (69) which could be analyzed as having vowel harmony. The first vowel can be realized as schwa (69a). But, it can also be realized as a copy of the second vowel (69b). When parsed, both vowels are in the same foot, thus allowing for vowel harmony. In this case, though, the vowel harmony occurs leftward.

(69)a. ḳwe7úp (ḳwe.7úp)

b. ḳwu7úp (ḳwu.7úp)

5.1.6 Phonemic vowel harmony with clitics

Our account for vowel harmony does not account for all of the cases of vowel harmony that we find with clitics, whether aspectual or nominal. I therefore offer some preliminary thoughts about vowel harmony here.

Vowel harmony is found to occur in the following three cases with the verb phrase clitics. I have parsed these forms following Dyck's (2004) parsing for Squamish.

- (70) **kwi s-na-s**
DEM NOM-RL-3POSS
- a. **kwi s-ni-s** (kwis)(nis)
- b. **kwi s-i-s** (kwi.sis)
- (71) **kwi s-wa-s**
DEM NOM-IMPF-3POSS
- kwi s-wi-s** (kwis)(wis)

From our account we would only predict vowel harmony for (70b), since it is the only form wherein the two vowels are parsed in the same foot.

One possible solution is the process of vowel harmony in the clitic domain is not constrained by the prosodic foot. Again, this hypothesis is difficult to test given the clitics are a small, closed set in the lexicon. One other possible case of a clitic harmonizing with the root is the frozen form for the 'hortative', as in (72a). It appears to have the 'imperative' clitic which normally surfaces as *-ka*, as in (72b). I have provided the parsing for these forms.

- (72)a. **wí7-s-ki** (wí7s)(ki)
go.ahead-CAUS-IMPER
'Let's _____'
- b. **emút-ka** (em.mút)(ka)
sit-IMPER
'Sit down!'

Importantly, for our discussion, the imperative is not parsed in the same foot as the verbal root. Yet, at least for the 'hortative' construction, its vowel appears to harmonize with the verbal root.

Clitics in *Słwɣwu7mesh*, however, often display different phonological properties from words elsewhere in the grammar. Take, for example, the subjunctive subject clitics (often called the conjunctive subject clitics in Salish). When they are combined with certain clitics, their initial glottal stop is realized as glottalization on a previous obstruent, such as:

- (73)a. \underline{k} + 7an ---> \underline{k}' an
 b. lh + 7an ----> tl'an

However, if the subjunctive subject follows a verb which ends in an obstruent, the clitic's initial glottal stop is simply deleted. This is the pronunciation in (74a). Unlike in (73a-b), its initial glottal stop does not get realized as glottalization on the final obstruent (74b). The verb's initial glottal stop, however, can optionally be realized as glottalization on the preceding clitic (74c).

- (74) \underline{k} + 7ítut + 7an
 SUBJ + sleep + 1S.SUBJ
- a. \underline{k} 7ítutan
 b. * \underline{k}' ítut'an
 c. \underline{k}' ítutan

Given that the clitic domain allows for phonological processes different from those found in other domains, it is reasonable to assume that the same holds for the process of vowel harmony. A modified account may be required to understand the domain of vowel harmony with clitics. One possible explanation could be that the parsing of clitics is different than that of verbs and nouns. To date, no study has been done on the parsing of these clitics to test this.

As far as the one other putative example of allophonic vowel harmony, the adverbial phrase *ti stsi7s*, I have no other cases of such harmony spreading from the determiner to the head noun. I have no explanation for vowel harmony here. It is possible that the process of vowel harmony itself is being reanalyzed and for some speakers it has started to spread differently in different domains. Recall, though, that this alternative pronunciation is only accepted by some speakers.

5.1.7 Allophonic vowel harmony: CV- reduplication and one DP

Our account for vowel harmony can also be applied to our one clear case of allophonic vowel harmony which occurs with CV-reduplication. Example (37b) is repeated here as (75a) with all three possible, phonetic realizations. In (75b) I provide the parsing for this form.

- (75)a. sí-siḱ [sé·seq] [sé·seq] [sé·seq]
- b. (sí.sḱ)

As with the majority of cases of *phonemic* vowel harmony, *allophonic* vowel harmony also occurs within the same foot. It is also circumscribed by the prosodic foot.

The other case of allophonic vowel harmony is the one adverbial DP *ti stsi7s* ‘today’. It does not parse into a single foot yet there is allophonic vowel harmony spreading from the determiner to the noun, unexpectedly. I have no account for this, except that, perhaps as with the English equivalent, the *Sḱwḱwu7mesh* DP has been reanalyzed as a single word.

5.1.8 Vowel harmony – conclusion

This examination of the domain of vowel harmony in Squamish demonstrates that by far the majority of cases of both phonemic and allophonic harmony occur within the same foot. Furthermore, vowel harmony is not restricted to the transitivity domain:

- (76)a. the transitive constructions: DIR and VDIR
- b. the intransitive construction: *-m*
- c. CV7 bare roots
- d. diminutive reduplication
- e. a few miscellaneous intransitives
- f. CV- reduplication.

Only two cases of vowel harmony do not appear to occur in the same foot:

- (77)a. phonemic vowel harmony with aspectual clitics
- b. allophonic vowel harmony in DP.

In by far the majority of cases, vowel harmony occurs between vowels in the same prosodic foot in *Sḱwḱwu7mesh*. This, I have argued, indicates that Dyck’s (2004) account can be expanded to include these

cases other than just the two transitivizer constructions. Vowel harmony, besides occurring with transitivizers, also occurs with the intransitivizer *-m* and with CV- reduplication for both nouns and for verbs. Instead, I argue, it is possible to simply state that vowel harmony occurs between vowels when they occur in the same prosodic foot as the root. The process of vowel harmony with the two transitivizer constructions falls out from this more general phonological process. Furthermore, since it is no longer necessary to include this information in the definition of the V with the DIR, we are now left with explaining its other realizations: stressed and unstressed schwa and stressed /á/.

Such a constraint undoubtedly overgenerates. Already it is clear that the vast majority of root plus lexical suffix combinations do not result in vowel harmony. The vowel of the affix is maintained in the majority of cases. That vowel harmony does occur for some speakers may indicate, in an OT-type of account, that two (sets of) constraints are not strictly ranked for all speakers. For example, the constraints responsible for deriving vowel harmony may be lower ranked than those responsible for maintaining an affix's vowel, for those speakers who do not have vowel harmony with lexical suffixes. For those who do, though, they may have the reverse ranking available. This requires further research.

I now turn to an examination of schwa strengthening.

5.2 Schwa strengthening

In §4, we examined four different occasions of schwa-/á/ alternations, summarized again in the table below.

Alternation	Example	Conditioning Factor for /á/
a. some CVC-Reduplicants	sháy - sheych'ántsut	Stress (secondary)
b. V before <i>-m</i>	mikw'-shn-á-m̄ mík'w'-shn-e-m	Stress (primary)
c. subject clitics	chen chán	Semantics, syntax, discourse-pragmatics
d. possessive suffix	-chet -chát	Stress (primary)

Table 4: Schwa-/á/ alternations

In summary, schwa-/á/ alternations occur with CVC-reduplicants, with V before the intransitivizer *-m*, with the subject clitics and in one environment with the first person possessive suffix. Except for the subject clitics, I noted that the presence of stressed /á/ correlates with either primary or secondary stress. The presence of the stressed /á/ forms for the subject clitics is conditioned by factors other than just stress. I will examine those three cases which appear to be conditioned by primary or secondary stress.

I will now note some of the stress properties of the three cases of stressed /á/ that appear to be solely conditioned by stress. My argument here is this: I propose that in all these cases schwa is changed to a stressed /á/ in a process which I call *schwa strengthening*. A schwa is strengthened to a stressed /á/ in order to provide a mora for that syllable, a mora which schwa cannot provide (Dyck, 2004, also Shaw et al 1999 for closely related Halkomelem). In other words, schwa strengthening is a repair strategy for prosody in Squamish. While it is beyond the scope of this paper to provide a full phonological account of primary and secondary stress in Squamish, I will make some preliminary notes on some patterns that arise from the data. I will follow Dyck's (2004) proposal for parsing. I turn to the CVC-reduplicants first.

5.2.1 Schwa strengthening with the CVC- reduplicant

The following are examples of schwa strengthening with the CVC- reduplicant, examples from (45) and (46) repeated here as (78) and (79), with secondary stress indicated.

- (78)a. shàýsheych'ántsut
- b. nexwyàiyelxáy
- c. wàlwel.kw'áls
- d. làplepxwántsut
- e. tsàxwtsexwsténam'ut
- f. lhàk'lhek'elélmen
- g. tsàkw'tskw'átsut
- h. tàxwtxwaya7ní7m

- i. **eskáxwķexw**
- (79)a. **màýmúyun**
- b. **màýmúyuntsut**

The following example in (80a) is with my parsing into feet following Dyck (2004).¹⁵ Example (80b) is the expected, but unattested, form with the stressed schwa.

- (80)a. ✓(shàý)(shey)(ch'án)(tsut)
- b. *(shèý)(shey)(ch'án)(tsut)

The reason that (80b) is not optimal, I argue, has to do with stress and moras. As Dyck (2004) argues for *Skw̥xwu7mesh*, schwa does not carry a mora and neither do glottalized resonants, such as /ý/. Stress in Squamish is looking for a syllable with a mora. We now have one possible reason why we find stressed /á/ instead of schwa with these CVC-reduplicants: it is inserted to provide a mora for stress. Since neither schwa nor glottalized resonant /ý/ are moraic, stressed /á/, which is moraic, surfaces instead. While the addition of this vowel obscures the identity of the root, the regular form of the root is found in the following feet. Furthermore, the CVC-reduplicant rarely surfaces with the same vowel as the root anyway, given that the reduplicant normally surfaces with a schwa.

Supporting evidence for our hypothesis here for schwa strengthening comes from the schwa-based roots that do not have schwa strengthening with their CVC-reduplicant. I repeat the examples from (42) here in (81).

¹⁵ The following proposals from Dyck (2004) are relevant regarding the parsing of this word. For the first foot, the CVC-reduplicant:

- a) CVC-reduplicant is also a root and is always parsed separately into its own syllable, even if this creates a deficient foot.
- b) resonants at the edge of a foot are glottalized

For the second foot:

- a) the root itself must be parse as its own foot.
- b) if the root is longer than CVC then only the CVC portion of the root is parsed as the root. The extra consonant becomes the onset of the following foot.

(81)	Schwa based roots	
	Non-reduplicated	Reduplicated
a.	é̃xwu7n cough 'to cough'	7é̃xw-7é̃xwu7n RED-cough 'to cough all the time'
b.	kwé̃lash-t shoot-TR 'to shoot (something)'	kwel-kwé̃lash-t RED-shoot-TR 'to shoot (something) continuously'
c.	xewtl'-á-n break-V-DIR 'to break (something)'	xew-xewtl'-á-n RED-break-V-DIR 'to break (a pile of things)'
d.	xé̃ch-n-exw remember-DIR-3OBJ 'to think of (something)'	xé̃ch-xech-s RED-remember-CAUS 'to remember (something)'

In examples (81a-b), stress fall on the first vowel of the word and, therefore, there is no secondary stress on the reduplicant. In example (81c), the CVC reduplicant is not written with a stressed /á/, but this may be a transcription error, since one of the allophones of schwa adjacent to a uvular is [a]. This example may therefore be another case of schwa strengthening. However, example (81d) has the primary, and only stress, on the reduplicant, yet there is no stressed /á/. This demonstrates that not all tokens of a reduplicant derived from a schwa based root have a stressed /á/.

Two of our examples in (79a-b) do not fit our establish patterns for alternating stress, either. They have secondary stress and primary stress in contiguous feet. I have no account for this. Nevertheless, the foot with secondary stress has its schwa strengthened to /á/.

One last piece of data we have yet to review is the alternate pronunciation of *as* (47), repeated here as (82). In this case, the diphthongs in the initial two syllables get vocalized. This strategy also appears to cause the CVC reduplicant to not get secondary stress.

(82) ✓(shi)(shi)(ch'án)(tsut)

5.2.2 Schwa strengthening before *-m* intransitivizer

Recall that the vowel V before *-m* is realized as /á/ when it is stressed, otherwise it is realized as a schwa. I propose that the

appearance of the stressed /á/ is due to schwa strengthening. I repeat (48b) and (49b) as (83a-b).

- (83)a. **mikw'-shn-á-ṃ** **chen**
 wash-foot-V-INTR 1S.SUB
 'I'm going to wash my feet.
- b. **chen** **mík'w'-shn-e-m**
 1S.SUB wash-foot-V-INTR
 'I washed my feet.

Before discussing these forms, I further provide parsing into feet for these two forms. Examples (84a-b) provide the parsing for (83a-b), respectively. The intransitivizer *-m* is glottalized in the penultimate syllable of (84a), indicating that it is at the edge of a foot, leaving the subject clitic either unparsed even though it is part of the parsing of this sentence.

- (84)a. (mikw')(shná'ṃ)chexw
- b. chen(mík'w')(shnem)

Firstly, the presence of the stressed /á/ in the example (85b) results in its syllable having one mora via the full vowel. Without the stressed /á/, this syllable would be moraless since neither stressed schwa nor a glottalized resonant can receive a mora, as shown in (85b). Thus the second foot of the word would be moraless and the last syllable (the subject clitic) would also be moraless.

- (85)a. ✓(mikw')(shná'ṃ)chexw
- b. ✗(mikw')(shné'ṃ)chexw

As for a possible alternative hypothesis, if the underlying vowel for V here were /a/, then we might expect a form such as in (86a) to surface instead of (86b). The last syllable with the intransitivizer would be expected to compete for stress and win every time, since the rightmost stress dominates. This is clearly not the case, though. If we assume that V in this example is an epenthetic schwa, then we can derive the stress for this word straightforwardly. The only fully formed foot is the (ch'ay.ya) foot.

- (86)a. *chen(chà.ya)(kám)

- b. chen(cháy.ya)kem

5.2.3 Schwa strengthening with *-chat*

Briefly, one example with the first person possessive clitic also indicates that its vowel is strengthened to stress /á/, when its syllable require primary stress. I repeat examples (55a-b) as examples (87a-b).

- (87)a. kwi-s ch'áw-a-t-umi-**chet**
 DET-NOM help-VDIR-TR-2S.OBJ-1PL.POSS
 'our helping you (sg)' = (that we help you (sg))
- b. kwi-s ch'áw-a-t-umi-**chát-wit**
 DET-NOM help-VDIR-TR-2S.OBJ-1PL.POSS-PL
 'our helping you (pl)' = (that we help you (pl))

The following examples form show these forms parsed as is implied by Dyck (2004:323-324)

- (88)a. (ch'áw.wa)(tum.mi)**chet**
- b. (ch'áw.wa)(tum.mi)(**chát**)(wit)

Again, we find that stressed /á/ is occurring where stressed schwa is expected to occur. In example (88b), stress appears to be alternating over feet. This pattern, then, requires that the first person possessive clitic, *-chet*, which is normally realized with a schwa, to bear (primary?) stress. This requirement for stress in turn results in its vowel being changed to a stressed /á/. I offer that this is another case of schwa strengthening. Schwa has been strengthened to /á/ to help its syllable meet the requirements of prosody.

6 Conclusion

In this paper we examined data in Squamish on both vowel harmony and schwa alternating with stressed /á/. Vowel harmony occurs most often between vowels in what appears to be the same (CVCV) foot. I also described, certain cases of schwa alternating with /a/ as schwa strengthening. I hypothesized that schwa strengthening may be taking place in order to satisfy moraic requirements relating to stress since stressed /á/ in these cases appears to carry either primary or secondary stress. It is yet to be determined, though, what the exact conditions are for when schwa strengthening takes place and when it does not for all

cases that we have examined. Nevertheless, we have seen that schwa strengthening is an available phonological strategy available in *Skwxwu7mesh*.

I further propose that, given that we have shown about vowel harmony and schwa alternating with /á/, it is a reasonable hypothesis that the various properties of V are derivable from the general properties of vowel harmony and schwa strengthening. That is, V's properties can be derived independently from more general phonological processes in the language, instead of being lexically specified. If V is simply an epenthetic schwa as Jacobs (2011) proposes, then such a pattern is fully expected from its various realizations as schwa. Schwa in Squamish, and in Salish in general, derives its specific features from the surrounding context. If this account is on the right track, then this context also includes: i) foot structure, e.g. its can get its features as a copy vowel when foot internal to the root or ii) stress properties, e.g. it can surface as stressed schwa or as stressed /á/.

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Peter Jacobs
pejacobs@uvic.ca