STRESS IN SQUAMISH*

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Stress assignment in Squamish appears to be extremely complex and to contain a high degree of arbitrariness if judged by the following examples:

(1)

'six'	'seven'
A) t'ə́q̓ač̓ (things)	D) t'aw̓usə́č̓ (things)
B) t'at'q̓áč̓ (animals)	E) t'ə́t'kʷusə́č̓ (animals)
C) t'əq̓t'ə́q̓ač̓ (people)	F) t'əx̌ʷt'ə́tʷusə́č̓ (people)

In forms A, B, and D, stress is on the final syllable (ultimate). In form C stress is penultimate, and in forms E and F two stresses appear in each word. Both have final stress, but form E has in addition a second stress on the initial syllable (pre-antepenultimate) and form F) has stress on the second syllable from the left (antepenultimate).

We propose in this paper, however, that stress is predictable and rule-governed. The principles of stress assignment (rules) are relatively simple to formulate. There are three ordered rules which apply cyclically to morphologically determined bracketing, and the

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Stress is generally penultimate in noncomplex, polysyllabic words. The following rule will account for the stress placement in all of the forms in (2):

(3) Basic Stress Assignment: V ——> [+stress] / ——— $(C_0V)C_0$ #

The usual conventions for rule application hold for rule (3). The rule collapses two rules which must apply disjunctively. The first expansion of the rule includes the material in the parentheses and will assign stress to the penultimate syllable. If the word is monosyllabic, this single syllable will also be stressed by the remaining part of the rule which excludes in the material in parentheses.

Stress is not always penultimate, however. The forms below demonstrate the variability of stress in similar grammatical constructions. All of the examples are verbs to which the transitivizer /-*Vn/ has been added.

(4)

CaC + an		CuC + an	
pák^{w}-an	'cut meat'	ʔúp-un	'connect'
táq^{w}-an	'drink'	yúc-un	'nudge, push aside'
t'ák^{ʔw}-an	'dig'	?ux^{w}-un	'plane, dress, cut'
qáy-an	'put up high'	yuh-un	'burn'

CiC + in		CVCC + an	
nik^{ʔw}-in	'wash'	cels-án	'scour'
ciq-in	'stab'	cək^{w}x-án	'fry'
pic-in	'squeeze'	wəlq^{w}-án	'boil'
λik^{ʔw}-in	'hang, hook'	cətq^{ʔw}-án	'crumble'

n.b. stem vowel is ə

Stress retraction, except when stem vowel is ə.

There is an obvious relationship between the suffix vowel in the transitivizing suffix and the stem vowel of the preceding verb. We note that except for the examples in D), the suffix vowel harmonizes with the preceding stressed stem vowel. We account for this

phenomenon with a rule of vowel harmony:

(5) Vowel Harmony: $V \longrightarrow \begin{bmatrix} \alpha\text{high} \\ \beta\text{back} \\ \gamma\text{low} \end{bmatrix} / \begin{bmatrix} +\text{stress} \\ \alpha\text{high} \\ \beta\text{back} \\ \gamma\text{low} \end{bmatrix} C + \text{———} C \#$

The Vowel Harmony rule must be considered tentative since we have not yet attempted to work out the exact details of the assimilation process. It will be sufficient to account for all of the forms which are discussed in this paper.

The forms in D) present a special problem since stress is on the final syllable. We propose that the position of the stress in these words is the result of a stress protraction rule which moves stress over a morpheme boundary just in case two consonants occur between the two vowels. We contend, then, that the transitivizing suffix is basic /-an/, and that all the forms in (4) undergo the basic stress rule (3), but that stems ending in two nonsyllabics undergo the subsequent rule of stress protraction. We formulate a preliminary version of the stress protraction rule below:

(6) Stress Protraction: $\overset{1}{\hat{V}}\ \overset{2}{C}\ \overset{3}{C}\ +\ \overset{4}{V}\ \overset{5}{\ } \Longrightarrow [-\text{stress}]_1, 2, 3, 4, [+\text{stress}]_5$

Our present rules, ordered Basic Stress (3), Stress Protraction (6), and Vowel Harmony (5) will now account for all the forms in (3) as the following derivations demonstrate:

(7) Underlying:	/ˀcup+an/	/pak^{w}+an/	/nikˀ^{w}+an/	/ˀcels+an/
Basic Stress (3)	ˀcúp+an	pák^{w}+an	níkˀ^{w}+an	ˀcéls+an
S.Protraction (6)	———	———	———	ˀcels+án
V.Harmony (5)	ˀcúp+un	pák^{w}+an	níkˀ^{w}+in	———
Surface	ˀcupun	pak^{w}an	nikˀ^{w}in	ˀcelsán

The two rules of stress assignment, (3) and (6), receive additional motivation from forms with reduplicated prefixes. The reduplication

process is of two major types in Squamish: partial and full. Forms with partial reduplication prepose a copy of the first consonant (excluding nominalizing s) and the first syllabic segment. Forms with full reduplication prepose the initinal CVC string. Examples of relevant forms are listed below:

(6) A) Full reduplication in forms with full vowels (a,i,u)

Reduplicated		Simplex (when available)	
ləmlə́m?	'houses'	lə́m?	'house'
səmsínʌ̀	'senior-line children'	sínʌ̀	'senior-line child'
kʷəmkʷím	'red'		
ʔəsʔə́ls	'green'		

B) Full reduplication in forms with reduced stem vowels (ə) Why is ə a "reduced" vowel?

Reduplicated		Simplex	
s-xə́nxən	'legs'	s-xə́n	'leg'
mə́n?-mən	'offspring'	mə́n?	'child'
tə́qʷtəqʷ	'red codfish'		
tʼə́xtəx-ə	'have the mouth open'		

C) Partial Reduplication in forms with full vowels

Reduplicated		Simplex	
pə́-pəcʼ	'be very hot'	pə́cʼ	'hot'
kʷə́-kʷəy?	'be very hungry'	kʷə́y?	'hungry'
ʔíʔiq	'leak'	ʔíq	'leak'
tʼútʼukʷ	'go home'	tʼúkʷ	'go home'

D) Partial reduplication in forms with reduced vowels

Reduplicated		Simplex	
ʔəs-sə́sq̓ (ʔəs- is stative prefix)	'split, cracked	sə́q̓, sáq̓	'split, crack'
ʎə́-ʎəmʔxʷ	'rain'	ʎə́mʔxʷ	'rain'
s-qʷə́qxʷ	'gathering'	qə́xʷ	'be gather'

Stress is on the reduplicated prefix in all of examples except those in 8A). These stress patterns can all be accounted for by adjusting the stress protraction rule (6). Namely, we now allow stress to be protracted over two consonants if a morpheme boundary occurs somewhere between the two vowels, but stress will only protract onto a full vowel. This adjustment in the protraction rule is consistent with our earlier analysis of the transitivizing affix /-an/. The vowel is full, and stress predictably shifts when the other conditions of the rule are met. The revised form of stress protraction is now:

(9) Stress Protraction: $\overset{1}{\hat{V}}\ \overset{2}{X}\ \overset{3}{V}$ ===> [-stress]$_1$, $_2$, [+stress]$_3$

Where X contains unordered (C,C,+) and V_3 is a full vowel.

There are also cases where a +C+C+ sequence will allow Stress Protraction. (cf. cíqin </ciq + an/ 'stab something' vs. ciqcám < /ciq + c + an/ 'stab something in the mouth'). The revised form of stress protraction (9) will now account for all of the forms in (8) as the following examples demonstrate:

(10)	Underlying	/lam + lam?/	/s-xʷən + ʷən/	/p̓a + p̓aʔ/
	Basic Stress (3)	lám + lam?	s-xʷán + xʷən	p̓á + p̓aʔ
	S. Protraction (9)	lam + lám?	————————	————————
	Surface	lamlám?	sxʷánxʷən	p̓áp̓aʔ

The forms with unstressed full vowel reduplicated prefixes undergo an additional reduction process which reduces the initial vowel to ə. The vowel reduction process is quite complex, and we propose for this paper the following preliminary version:

(11) Vowel Reduction: V ———> [+reduced] / ———— C + C V́

The stems in (8) are all monosyllabic, and the assumption has been that the sequence of the reduplicated prefix and stem was the unique domain of the stress assignment process. The stress rules developed so far predict that stress will never be on the prefix if the root is polysyllabic. The prediction is false as the following examples demonstrate:

(12) A) Reduplicated — Simplex

Reduplicated		Simplex	
t'ét'ayaq̓	'be very angry'	t'ayaq̓	'be mad'
s-c'í-c'inu	'fir cone'		
?ú-?um?ic	'go upstream'		

B) s-?éq̓ʷ-?eq̓ʷi?tl 'siblings and cousins'
qép̓-qpus 'face downward' < /qep̓ + qep̓ + us/

C) sé-šew?ay 'grow all over'
c̓é-c̓en-t-sut 'decrease (about moon)'
but

D) kʷeɬʷ-kʷáxʷa	'boxes'	kʷáxʷa?
kʷepkʷúpic	'elder siblings'	kʷupic 'elder sibling'
?em-?ímac	'grandchildren'	?ímac 'grandchild'

We observe, then, that stress can be placed further into a word than the absolute penultimate position. Moreover, there are other cases not involving reduplicated prefixes in which stress will end up on a syllable to the left of the penult.

(13) cíq-s?an 'be stabbed in the cheek'
cíq-apsam 'be stabbed in the neck'
cíq-axan 'be stabbed in the side'
cíq-alap 'be stabbed in the thigh'

The forms in (13) all contain morphemes which Kuipers designates as somatic affixes. Somatic affixes refer to parts of the body, and

when added to a verb form a unit which in turn acts like a complex verb. That is, grammatical morphemes such as transitivizers are attached to the right of the combined unit. If we posit that stress is sensitive to morphological bracketing, and in turn posit that the bracketing of cíqa?an and t'át'ayaq̓ is [[ciq] + a?an] and [[t'a] + [t'ayaq̓]], respectively, then the following derivations will result.

(14) Underlying /[[ciq] + a?an]/ /[[t'a] + [t'ayaq̓]]
Basic Stress (3) cíq á?an t'á + t'áyaq̓

Two adjacent stresses are rare in Squamish (Kuipers refers to ʔáx^{w}ʌ́ʔx^{w} 'oyster' as being exceptional in that two adjacent equal stresses are found (p. 105)). We posit a rule of erasure to delete the rightmost of two adjacent stresses.

(15) Erasure: V ——> [-stress] / V C_0 ————

The Erasure rule now applies to the forms in (14) to yield the correct cíqa?an and t'át'ayaq̓. Our system of rules now predicts that words can have two stresses if multiple bracketing is present and the condition of erasure is not met. Such stress patttterns do, in fact, occur.

(16) cíq-apsám-n </[[ciq] + apsam + an]/ 'stab s.o. in the mouth' (note transitivizer /-an/).
cíq-ayán-n </[[ciq] + ayan + an] 'stab s.o. in the side'
cíq-alap-n </[[ciq] + alap + an] 'stab s.o. in the thigh'

Not all examples with the morphological structure exhibited in (16) show two stresses. Frequently, only the rightmost stress is marked.

(17) ciq-inús-n < /[[ciq] + inas + an] 'stab s.o. in the chest'
ciq-ʌ?ʌ́ps-n < /[[ciq] + ʌ?ups + an] 'poke at (an animal's) tail'
qʌ́\-ʌ?ʌ́ps-n < /[[qʌ́\] + ʌ?ups + an] 'cut off (an animal's) tail'

What rules 15 & 18 say is that you erase the stress that results in the wrong surface form — purely ad hoc.

rather ad hoc

To handle cases such as those in (17) we hypothesize that there is an optional rule which either lowers a leftmost stress to secondary, or perhaps deletes it, so that the rightmost predominates. Since there is no difference in basic morphological structure between the forms in (16) and (17) we propose that the stress adjustment rule is optional.

(18) Stress Adjustment(optional): V ⟶ [lowered stress] / ⟶ V

Returning now to the forms with full reduplication, it will now be the case that stress will also be assigned to the prefix. Erasure does not apply, however, and instead, stress protraction applies. A natural way to handle this is to order the protraction rule prior to the Erasure rule. We will soon present evidence that this particular order has positive empirical consequences for other forms in Squamish. We demonstrate next how stress is assigned to the following forms exhibiting full reduplication.

(19) Underlying	/[[kʷəxʷ]+[kʷəxʷə?]]/	/[[ləm]+[ləm?]]/
Basic Stress (3)	kʷə́xʷ kʷəxʷə?	lə́m + lə́m?
Stress Pro. (9)	kʷə́xʷ kʷəxʷə?	ləm + lə́m?
Erasure (15)	——— ———	——— ———
Vowel Reduc. (11)	kʷəxʷ kʷə́xʷə?	ləm lə́m?
surface:	kʷəxʷkʷə́xʷə?	ləmlə́m?

We now have three primary rules to account for stress assignment in Squamish: a basic stress rule (3) which is sensitive to morphological bracketing, a stress protraction rule (9) and a stress erasure rule (15). We now consider some additional forms which appear to be exceptions to our system, and we show that they present further confirming evidence for our analysis. In the forms below, the example A) is consistent with the process of stress assignment, whereas form B) appears to be an exception.

(20) A) mik^{w}ačí?-n 'wash a hand' B) ʔaʔáčí?-n 'grab a hand'

The morphological structure of forms A) and B) is identical. Both consist of verb root followed by the somatic affix /-ač/ 'hand' and the suffix i? (Kuipers, p. 119) and the transitivizer /-an/. For the B) form we would predict (from the forms in (13) and (16)) either a form ʔáʔačí?-n or perhaps ʔaʔačí?-n. The solution to this problem lies in the determination of the underlying root of ʔa?. Kuipers analyzes this root as a basic /-ʔəh? or ʔih?/. (cf. ʔí?-t 'grab', or ʔí?-nex^{w} 'have hold of'). With either of the roots /ʔih?/or /ʔəh?/, our stress rules will assign stress correctly.

(21)	Underlying	/[[ʔih?] + ač + i? + an]/
	Basic Stress Assignment	ʔíh? + ač + í? + an
	Stress Protraction (9)	ʔih? + áč + i? + an
	Stress Erasure (15)	ʔih? + áč + i? + an
	Vowel Reduction (11)	ʔəh? + áč + i? + an

The stress will end up on precisely the correct vowel as predicted by our stress assignment process. We now need a rule to convert a əh into a. Kuipers discusses such a rule in considerable detail. He presents evidence for a general contraction rule which converts a V-glide sequence into a syllabic homorganic with the glide. That is, əh, əy, and əw become a, i and u, respectively.

(22) Contraction: $$\text{ə} \begin{bmatrix} +\text{son} \\ -\text{cons} \\ -\text{syll} \end{bmatrix} \quad \Longrightarrow \quad \emptyset, \ [+\text{syll}]$$
$$1 \quad 2 \qquad\qquad 1, \quad 2$$

The contraction rule (22) will now allow us to account for another set of apparent exceptions to the stress assignment process.

(13) Redupliсated

Reduplicated		Simplex	
s-tn-ƛ̓éw̓ʔx[w]	'children'	s-ƛ̓éw̓ʔx[w]	'child'
ʔi-ʔáyiš	'siblings of opposite sex'	ʔáyiš	'sibling of opposite sex'
šə-šáwʔus	'bony, skinny'	šáwʔ	'bone'

These forms are completely regular with respect to stress (and derivational morphology) in that they are underlying examples with full reduplication.

(14)

Underlying		/[[ʔay] + [ʔayiš]]/	/[[šaw] + [šawʔus]]
Basic Stress	(5)	ʔáy + ʔáyiš	šáw + šáwʔus
S. Retra	(9)	ʔay + ʔáyiš	šaw + šáwʔus
Erasure		———	———
Vowel Reduc.	(11)	ʔəy + ʔáyiš	šəw + šáwʔus
Contraction	(22)	ʔi + ʔáyiš	šu + šáwʔus
Surface		ʔiʔáyiš	šušáwʔus

The stress protraction rule, applying to the above forms, followed by the contraction process yields a surface sequence which appears to violate the stress assignment process which usually stresses a partially reduplicated prefix.

We are now ready to consider the forms in (1). They are given below in their underlying representation which has been established by the previous discussion. The form 'six' is analyzed by Kuipers as containing a root /t'ðq/ and the lexical (somatic) affix /sé/ 'hand'. The B) and C) forms result from the partial and full reduplication of the root. Similarly, the form for 'seven' is basic /t'əl̓[w]us/ with the root /t'ə/. The forms in E) and F) are also derived from this basic stem by the above mentioned prefixation process. We conclude our paper with the demonstration that the rules we have motivated earlier in this paper, when applied to the forms in (1) will account for the surface stress patterns.

(25)A) Underlying /[[t'aq̊] + [ać]]
Basic Stress (3) t'áq̊ + áć
Protraction (9) ———————
Erasure (15) t'áq̊ + ać́
Surface t'áq̊ać́

B) Underlying /[[[t'a] +[t'aq̊]] + [ać]]
Basic Stress (3) t'á + t'áq̊ + áć
Protraction (9) ———————
Erasure (15) t'á + t'aq̊
next cycle ———————
t'á + t'aq̊ + áć
Protraction (9) ———————
Erasure (15) ———————
Stress Adj (18) t'a + t'aq̊ + áć
Surface: t'at'q̊áć

A pretonic unstressed (and probably reduced) vowel will frequently drop between obstruents. Note that the vowel which disappeared had lost its stress on an earlier cycle.

C) Underlying /[[[t'aq̊] + [t'aq̊]] + [ać]]/
Basic Stress (3) t'áq̊ + t'áq̊ + áć
Protraction (9) t'aq̊ + t'áq̊
Erasure (15) ———————
next cycle ———————
t'aq̊ + t'áq̊ + áć
Protraction ———————
Erasure t'aq̊ + t'áq̊ + ać́
Vowel Reduction (11) t'əq̊ + t'áq̊ + ać́
Surface t'əq̊t'áq̊ać́

(25) continued

D) Underlying /[[t'ak^{2W}us] + [aĆ]]

Basic Stress	(3)	t'ák^{2W}us áĆ
S. Pro.	(9)	———
Erasure	(15)	———
Stress Adj.	(18)	t'ak^{2W}us + áĆ
Surface		t'ak^{2W}usáĆ

E) Underlying /[[[t'a] + [t'ak^{2W}us]] + [aĆ]]

Basic Stress	(3)	t'á + t'ák^{2W}us áĆ
S. Pro.	(9)	———
Erasure	(15)	t'á t'ak^{2W}us
next cycle		———
		t'á t'ak^{2W}us + áĆ
S. Pro.	(9)	———
Erasure	(15)	———
Stress Adj. (does not apply)		t'á + t'ak^{2W}us + áĆ
Surface:		t'át'ak^{2W}usáĆ

F) Underlying /[[[t'ak^{2W}]+ [t'ak^{W}us]] + [aĆ]]

Basic Stress	(3)	t'ák^{2W} + t'ák^{2W}us + áĆ
S. Pro.	(9)	t'ak^{2W} + t'ák^{2W}us + áĆ
Erasure		———
next cycle		———
		t'ak^{2W} + t'ak^{2W}us + áĆ
S. Pro.	(9)	———
Erasure	(15)	———
Stress Adj.	(18)	t'ak^{2W} + t'ak^{2W}us + áĆ
Vowel Reduc.	(11)	t'ak^{2W} + t'ək^{2W}us + áĆ
Surface:		t'ək^{2W}t'ak^{2W}usáĆ