however, begun recording the features of the morpho-syntactic
behavior of such limited predicatives as ni+ 'precisely that one; so'
and 'ə'və 'not' and have found these features to be different from
those of both auxiliaries and open-class predicatives.

⁴Where there is no indication to the contrary, all examples
are from the Klallam field notes of Dr. L.C. Thompson. After vowels,
˘ = primary stress and ' = secondary stress.

⁵Note that Person marking is not optional; zero marking =
third person. Regarding the elements in 5, it is not clear to us at
this time what, if any, is the fixed order of other particles with
respect to the oblique particle (OP) and prepositive demonstratives
(D). "Particles..." is not meant as a constituent label but is a
cover term for a number of prepositive particle constituents. Finally,
it should be noted that we found it difficult to fit Klallam into
an existing syntactic framework and so our rules are necessarily
undergoing development. We have deliberately avoided the labels Noun
and Verb for the present, hence the constituent labelled Pv
(predicative).

⁶Demers is following a parallel analysis presented for Luiseno
by Steele (1978).

⁷Since overt tense marking is optional in Salish languages,
Demers' phrase structure rule should be rewritten as:
AUX --> (Q) (Modal) (Tense) Personal Subject.
This leaves the pronominal as the only obligatory member of AUX.

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SOME PHONOLOGICAL PROBLEMS IN THE COWICHAN [1]
L-INFIX PLURAL

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1. INTRODUCTION

At least three apparently synonymous plural constructions are employed
in the Cowichan dialect of Halkomelem: CəC-reduplication, -Ci- infixal re-
duplication and l-infixation, as illustrated in the following examples.

(1) a. célə$\check{s}$ hand
    b. cəlcélə$\check{s}$ PL

(2) a. xʷə́lməxʷ   Indian

    b. xʷəxʷílməxʷ   PL

(3) a. técəl   approach
    b. té?ləcəl   PL

An adequate description of plural formation in Cowichan, then, should take
into account the formation processes involved in each construction, the dis-
tributions of these constructions relative to each other and--especially as
these are not simple affixal constructions--their formal relationships to
other morphological constructions (i.e., derivational order). The present
study is confined to a small portion of this overall description: the phono-
logical shape of the l-infix plural.

The limited scope of this work reflects the relative complexity of the
data, as the Cowichan l-infix exhibits a variety of alternate forms invol-
ving phonological processes which, in some cases, appear to be quite ideosyn-
cratic and restricted, but which are quite far-ranging in others, hopefully
forming a basis for a more encompassing study of Cowichan phonology.

While alternate analyses will be considered below, I suggest that l-in-
fixation involves a vowel copying rule (much as does reduplication) which is
obscured by stress placement and the reduction of unstressed vowels to shwa.
This analysis explains an interesting, but perhaps not obvious, parallel be-
tween infixation and reduplication in strong-syllable roots (those with a
long vowel (VV) or vowel plus /?/).

2. PHONOLOGICAL ALTERNATES

The l-infix appears to follow the first CV sequence of the base (exclu
ding all nonreduplicative prefixes), unless the vowel is long or followed by
/?/ (hereafter, *strong syllables*), in which case it seems to follow the first
consonant (and then contains no glottal stop).

(4) a. $\check{s}$ə́$\acute{\text{K}}$ʷəm   bathe
    b. $\check{s}$ə́?ləKʷəm   PL

(5) a. pus   cat
    b. pú?ləs   PL

(6) a. s-ʠééx̌   otter
    b. s-ʠəlééx̌   PL

(7) a. s-ca?tx̌   halibet
    b. s-cəlá?tx̌   PL

It follows the first consonant in CC initial bases, preceded by a presumably epenthetic shwa, and it has no glottal stop.

(8) a. s-ƙʷɬey̓   littleneck clam
    b. s-ƙʷəlɬey̓   PL²

(9) a. ƈx̌émən   chest
    b. ƈəlx̌émən   PL

In Cə initial bases, where shwa is unstressed, the infix could be analyzed again as following CV, although it has no glottal component and generally it is not followed by shwa (unlike other cases where the base is CV, as in (5)), hence it more closely resembles the CC cases.

(10) a. səplíl   bread
     b. səlplíl   PL

(11) a. ?əx̌θím?tən   dipnet
     b. ?əlx̌θím?tən   PL

CV initial bases with /i/ or stressed shwa show stressed /e/ preceding the infix.

(12) a. mít̓θət   mash it
     b. mé?lət̓θət   PL

(13) a. sítən   basket
     b. sé?lətən   PL

(14) a. s-ƛ̓θəƙʷ   worm
     b. s-ƛ̓θé?ləƙʷ   PL

(15) a. θət   say
     b. θé?lət   PL³

In addition, the glottal segment is lost if the infix is followed by a voiced sonorant.

(16) a. hewt   rat
     b. héləwt   PL

(17) a. q̓ʷim   get off a vehicle
     b. q̓ʷéləm   PL

(18) a. ƈəy̓xʷ   dry
     b. ƈéli?xʷ   PL⁴

Note that the loss of /?/ does not depend on the vowel preceding the infix, applying to the plurals of Ci and Cə initial bases as well as the simpler cases.

3. PLACEMENT

It strikes me that the major problem is accounting for the distribution of the infix with respect to tense vowels--that it appears to precede strong syllables and to follow others. At least three analyses are not implausible:

   i. the infixation rule is sensitive to strong syllables, inserting the infix before the vowel in just this case;

   ii. the infix always immediately follows the first consonant and a preceding tense vowel is actually a copy;

  iii. strong syllables receive early stress and the infixation rule is sensitive to this, inserting the infix before the vowel just in case it is stressed.

This section focuses on these alternatives. While (ii) seems preferable to me, (iii) may be a viable alternative, although it requires the mixing of levels.

3.1. Analysis I

The first alternative seems the most straightforward, as it is simply a restatement of the distributional facts. We can say that the infix follows the first vowel (if there is a vowel), but follows the first consonant if the syllable is strong. I will assume hereafter that long vowels are geminate (VV), although this is not a necessary assumption.

Rule 1: Infixation (I)

$$\emptyset \longrightarrow +\langle ? \rangle 1+ \ / [C\langle V \rangle \_\_\_ \left\langle \begin{bmatrix} -\text{syllabic} \\ \alpha\text{sonorant} \\ \alpha\text{voice} \end{bmatrix} \right\rangle$$

This schema decomposes into two disjunctively ordered rules:

a. $\emptyset \longrightarrow +?1+ \ / [CV \_\_\_ \begin{bmatrix} -\text{syllabic} \\ \alpha\text{sonorant} \\ \alpha\text{voice} \end{bmatrix}$

(/+?1+/ is inserted after initial CV if followed by any segment but a vowel or /?/ (and, vacuously, /h/).)

b. $\emptyset \longrightarrow +1+ \ / [C \_\_\_$

(Elsewhere, /+1+/ is inserted after the first consonant.)

Additional rules will be required in accounting for the distribution of shwa, as indicated by the following derivations.

	šaƙʷəm (4)	s-ʠeex̌ (6)	s-ƙʷɬey̓ (8)
infixation (a)	ša-?1-ƙʷəm	....	....
infixation (b)	....	s-ʠ-1-eex̌	s-ƙʷ-1-ɬey̓

Since the sequence #CS (S=[+sonorant], [-syllabic]) never occurs on the surface, let us assume shwa is inserted by the following rule.

Rule 2: Epenthesis (CS)

$$\emptyset \longrightarrow V/[C\underline{\quad}\begin{bmatrix} -syllabic \\ +sonorant \end{bmatrix}$$

I assume that the unmarked value for an epenthetic vowel in Cowichan is that of shwa.

The shwa following the infix in the derivation of (4) is more of a problem, since there is evidence that /ʔ/ plus a nonsyllabic sonorant merge to form a glottalized sonorant (Hukari, 1981) and glottalized sonorants may be realized as Sʔ when followed by a consonant, where an epenthetic shwa does not occur:

(19) háyʔqʷ   burning (progressive)

(20) ɗelʔɗ   getting tangled (progressive)

This may involve conditions which are as yet not understood, however, so let us assume tentatively that shwa is inserted in forms such as (4) by the following rule:

Rule 3: Epenthesis (ʔSC)

$$\emptyset \longrightarrow V/ʔ\begin{bmatrix} -syllabic \\ +sonorant \end{bmatrix}\underline{\quad} C$$

A further problem is the fact that unstressed Cə initial forms seem to pattern like CC initial bases, since the infix lacks /ʔ/ and there is no following shwa (cf, 10) unless the infix is followed by a sonorant, as in (21).

(21) a. xʷɔnítəm   white man
     b. xʷələnítəm   PL

All the relevant unstressed shwa forms found to date can be ascribed to the phonotactics of Cowichan; that is, the initial sequences SC or CS are not possible surface forms. The insertion of /ə/ in these contexts after infixation will account for this. A third epenthesis rule will handle this:

Rule 4: Epenthesis (#SC)

$$\emptyset \longrightarrow V/[\begin{bmatrix} -syllabic \\ +sonorant \end{bmatrix}\underline{\quad} C$$

(Shwa is inserted between an initial sonorant and a following consonant.)

This rule takes care of sonorant-initial forms such as (22). Obstruent-initial forms such as (21a) undergo Rule 2.

(22) a. mɔstíməxʷ   person
     b. məlstíməxʷ   PL

These shwa-insertion rules are highly tentative and will clearly require refinement in a more encompassing analysis of Cowichan phonology. For example, (2a) violates Rule 2 (although there is a morpheme boundary between /l/ and /m/ which may be relevant).

We can assume that the epenthesis rules follow infixation, as in the

following derivations.

	mstiməxʷ (22)	mstiməxʷ (22)	šaꝁʷəm (4)	s-ɗeeⱦ (6)
infixation (a)	....	....	ša-ʔl-ꝁʷɔm	....
infixation (b)	....	m-l-stiməxʷ	....	s-ɗ-l-eeⱦ
epenth. (R2)	....	məlstiməxʷ	....	s-ɗəleeⱦ
epenth. (R3)	....	....	šaʔləꝁʷəm	....
epenth. (R4)	məstiməxʷ	....	....	....

Stress placement will be considered in section 3.2 below.

Analysis I may be missing a significant generalization, despite the fact that it seems to be observationally adequate. Strong syllables are exceptional in reduplication as well as in infixation, since they retain their full quality rather than reducing to shwa. For example, the progressive (CV-) reduplication vowel is reduced in strong syllable forms instead of the base vowel.

(23) a. péƭθət   sew it
     b. pépəƭθət   PROG

(24) a. seʔt   lift it
     b. səséʔt   PROG

Similarly, the diminutive prefix normally copies a tense vowel (CVʔ-) and is Ciʔ- if there is no vowel (or the base vowel is shwa), while the base vowel is lost. However a strong syllable is retained and the prefix is Ciʔ-.

(25) a. š-cepθ   uncle/aunt
     b. š-ceʔcpθ   DIM

(26) a. š-kʷéʔəm   basket
     b. š-kʷiʔkʷéʔəm DIM

The fact that this phenomenon extends across three separate morphological processes cries for an explanation.

3.2. Analysis II

It seems highly likely that the exceptional behavior of strong syllables is a stress-related phenomenon, considering the fact that Cowichan is a stress-timed language in which unstressed vowels reduce to shwa. That is, the shwa vowel in the progressive of (24b) and the shwa preceding the l-infix of (7b) may be consequences of assigning stress to some other syllable. Suppose, then, that the infixation rule always copies the first vowel of the base, if there is one, as in the following rule.

Rule 5: Infixation (II)

$$\emptyset \longrightarrow +\langle V_i \rangle l+/C\underline{\quad}\langle V_i \rangle$$

The presence or absence of a tense vowel before the infix in cases where the vowel is copied will depend on subsequent stress assignment rules. Whichever vowel receives stress will retain its quality, while an unstressed vowel will reduce to shwa.

I will assume that a base (root) syllable receives stress if it is in base-final position (ignoring at least any inflectional suffixes). This rule may be formulated as follows, assuming long vowels are geminate and /ʔ/ is a sonorant (cf, Chomsky and Halle, 1968).

Rule 6: Strong Syllable Stress (SSS)

$$V \longrightarrow [+stress] / \left[\overline{+tense} \right] \begin{bmatrix} +sonorant \\ \alpha syllabic \\ \alpha voice \end{bmatrix}]$$

A number of putative counterexamples to this analysis exist, although I believe the vowel in question can be analyzed as shwa and that it tenses after Rule 6 applies. In such cases the quality of the vowel is predictable. It is generally /e/, but may be /a/ under certain conditions, as in (28) where the preceding vowel is /a/.

(27) méqeʔ   snow
(28) x̌áca ʔ   lake, swamp

There is considerable evidence that shwa tenses to /e/ or /a/ when followed by /ʔ/ in Cowichan, although further discussion of this goes far beyond the bounds of the present study.

A second rule relevant to the present analysis (but most certainly not the only remaining stress rule) handles the cases where the copy vowel is stressed, call this the Main Stress Rule.

Rule 7: Main Stress Rule (MSR)

$$V \longrightarrow [+stress] / [C^n \left\langle \begin{bmatrix} V \\ -tense \end{bmatrix} C \right\rangle^* \left[\overline{\langle +tense \rangle} \right]$$

(The first tense vowel in a base is stressed, otherwise, stress the first vowel (shwa).)

Leaving aside the interaction of roots and lexical suffixes, which I will not attempt to account for here, this rule has putative counterexamples involving stress on the second of two shwa vowels. Consider the following examples.

(29) məq̓ə́t   fill him/her
(30) mə́q̓ət   swallow

I will assume, along the lines of the previous section, that unstressed shwa, as in (31) is epenthetic and that (30) has an underlying shwa.

The reduplicative prefix of CəC roots also appear to be counterexamples to Rule 7, since the root is stressed (unlike the reduplication of tense vowels, where the prefix is stressed).

(31) a. təs   get close
     b. tətə́s   PROG
(32) a. ɬə́n̓əm   weave
     b. ɬəɬə́n̓əm   PROG

These constitute more serious counterexamples and suggest that Rule 7 should be reformulated to handle tense vowels only, with other rules for assignment of stress to shwa.

Rule 7': Main Stress Rule (MSR)

$$V \longrightarrow [+stress] / [C^n (\begin{bmatrix} V \\ -tense \end{bmatrix} C)^* \left[\overline{+tense} \right]$$

Further discussion of shwa stressing will be omitted here, as a more encompassing analysis of epenthesis seems warranted. Rules (6) and (7') suffice for the discussion at hand.

The following derivations are representative of Analysis II, with the exception of Rule 3, the epenthesis rules remain as in Analysis I. Rule 3 is no longer needed, since the shwa following the infix in (4) is now a reduced form of the base vowel.

	mstiməxʷ (22)	mstiməxʷ (22)	šaK̓ʷəm (4)	s-q̓eex̌ (6)
infix. II (a)	....	....	š-a ʔl-aK̓ʷɔm	s-q̓-e ʔl-eex̌
infix. II (b)	....	m-l-stiməxʷ	....	....
epenth. (R2)	....	məlstiməxʷ	....	....
epenth. (R4)	məstiməxʷ	....	....	....
SSS (R6)	.....	....	....	s-q̓e ʔléex̌
MSR (7')	mɔstíməxʷ	məlstíməxʷ	šá ʔlaK̓ʷəm	....

A vowel reduction rule is needed to convert the tense unstressed vowels in (4) and (6) to shwa. I assume that a lax vowel has the specification of shwa.

Rule 8: Vowel Reduction

$$V \longrightarrow [-tense] / \left[\overline{-stress} \right]$$

This rule will of course apply after Rule 6 and Rule 7'. I will return to the loss of /ʔ/ in forms such as (6) below.

The tense vowel (/e/) in plurals of Cə bases with initial stress remains to be explained. If these are the only cases of underlying shwa in this position, a rather simple explanation exists in Analysis I, that /-ʔl-/ is inserted after the vowel, which triggers a tensing rule, as in (27) and (28).

It is not clear that a similar analysis will work here. While it is true that unstressed initial Cə can be handled in the same fashion (since the infix will then lack /ʔ/, being inserted into underlying CC), strong syllable bases such as (6) create a problem unless glottal stop is eliminated in these forms before tensing applies, since the preceding vowel will become tense even if it has once been laxed. The as-yet unformulated rule deleting glottal stop when the infix is followed by a sonorant (cf, examples (16)-(18)) is of no use, since this must apply after tensing in (18) if glottal stop is to trigger the tensing rule.

(18) a. c̓əy̓xʷ   dry
     b. c̓éliʔxʷ   PL

While a number of solutions seem possible at this point, let us suppose the infixation rule copies all nonback vowels as /e/. Or, rather, that a tense vowel is inserted and that it agrees only with back vowels, the unmarked case otherwise being /e/, as in (27).

Rule 5': Infixation (II)

$$\emptyset \longrightarrow +\ _i \Bigg\langle \begin{bmatrix} V \\ +tense \\ \langle+back\rangle \\ \langle\triangleleft high\rangle \end{bmatrix} \ ? \Bigg\rangle 1+/C \ \underline{\quad} \ _i \Bigg\langle \begin{bmatrix} V \\ \langle+back\rangle \\ \langle\triangleleft high\rangle \end{bmatrix} \Bigg\rangle$$

This analysis will then account both for the apparent tensing in Cə initial bases (stressed) and the apparent lowering of /i/ to /e/. This analysis requires of course that unstressed shwa be epenthetic or otherwise it would wrongly predict that the plural of a form such as (10) would have /e/.

3.3. Analysis III

The third analysis is a modification of the first, incorporating Strong Syllable Stress and hence increasing descriptive adequacy. That is, infixation is ordered after Strong Syllable Stress but before Main Stress, and it is sensitive to stress. The infix follows the initial consonant and any (as yet) unstressed vowel.

Rule 9: Infixation (III)

$$\emptyset \longrightarrow +\ \langle ? \rangle 1+/C \Big\langle \begin{bmatrix} V \\ -stress \end{bmatrix} \Big\rangle \underline{\quad}$$

Here, as in Analysis I, underlying shwa will be tensed when followed by glottal stop and a special lowering rule, which is apparently morphologically conditioned, applies to /i/. I leave these for the reader.

While this analysis overcomes the problems of Analysis I, it forces us to assume that infixation is ordered between two stress rules. While we may not be able to dismiss the mixing of morphological and phonological rules out

of hand, an analysis which does not require this assumption should be more highly valued, all things being equal. For this reason, I prefer Analysis II.

4. GLOTTAL DELETION

A rule deleting glottal stop in the 1-infix is clearly needed in all three analyses and has not been formulated above. In addition, Analysis II requires the deletion of glottal stop in the infix before strong syllables. The latter context is not necessary in the other two analyses, since the infix immediately follows the initial consonant as in CC-initial bases, so it has no glottal component. It is, however, possible to formulate the rule so that glottal stop is deleted in all relevant contexts of Analysis II, since the second component of a strong syllable is a sonorant (i.e., VV and Vʔ).

Rule 10: Glottal Deletion

$$? \longrightarrow \emptyset \ / \ +V \underline{\quad} 1+V\ [+sonorant]$$

While the rule is formulated here only to apply on the 1-infix, a similar phenomenon occurs in diminutives, although it is not clear that the two cases should be formulated as one rule.

As noted above, the diminutive reduplicative prefix is Ciʔ- or CVʔ-. But the glottal stop is deleted if the second consonant of the base is a nonsyllabic sonorant.

(33) a. s-ɬéniʔ   woman
     b. s-ɬéɬniʔ   DIM

(34) a. hewt   rat
     b. héhəwʔt   DIM

A strong syllable, however does not form an context for glottal deletion in diminutives.

(35) a. š-kʷéʔəm   basket
     b. š-kʷíʔkʷéʔəmʔ DIM

(36) a. míít̓   blue grouse
     b. mèʔmíít̓   DIM

While it seems reasonable to expect the two cases of glottal deletion to be subsumed under one generalization, I will not attempt to do so here.

5. CONCLUSIONS

Three possible analyses of 1-plural infixation in the Cowichan dialect of Halkomelem have been examined. The second and third both provide explanations for the exceptional behavior of strong syllables (VV or Vʔ) in a way which allows for a generalization to be captured in three separate morpholo-

logical constructions. In the second analysis, infixation is, in part, a
copying rule in which a tense vowel is inserted and assimilates to following
back vowels, but reduced to shwa if not stressed. Stress fails to apply if
the next vowel undergoes Strong Syllable Stress. The third analysis assumes
that Strong Syllable Stress (but not Main Stress) precedes infixation, deter-
mining the placement of the infix before or after the first vowel. While
both rules seem descriptively adequate in so far as their consequences on
the rest of the phonology have been determined here, the second analysis seems
preferable, as it does not require the ordering of infixation, a morphological
rule, between two stress rules.

FOOTNOTES

[1]This work was supported in part by a grant from the Social Sciences
and Humanities Research Council of Canada. My thanks go to Ms Ruby Peter
of Duncan, B.C. Without her patient help the project would have been alto-
gether impossible.

[2]I have recorded various stress contours in such forms. Shwa probably
receives at least a secondary stress due to the following consonant cluster.
However the initial syllable of citation forms has high pitch, which I often
misinterpret as stress.

[3]This may be /čélɔy̌xʷ/ at some level, where shwa reduces out, as un-
stressed [ɔy̌ʔ] and [iʔ] seem to be alternate pronunciations, as in [p̌śliʔ]
or [p̌ślɔy̌ʔ] 'bark'.

[4]I would have predicted /θéʔɔlt/, as apparent metathesis usually occurs
when a sonorant is followed by a homorganic obstruent in this position:

šeł   door, path
šéʔɔlł PL

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A Contribution to Puget Salish Lexical Studies

Nile Thompson

This paper is intended as an augmentation to information already found in Hess's
Dictionary of Puget Salish. Proposed etymologies, utilizing data from closely related
Twana, are followed by a preliminary chart showing the lexical selection process for the
concept FALL. The symbol # is used to indicate roots, + for lexical affixes, - for
syntactic affixes and = for lexical adjectives (Hess's "lexical connectives").

1. #bal+i   ("busy" + "head")   forget
   cf Twana bibal?alčəd (bi-#bal-al-čəd), "I've been busy"
           kałi (#kał + i) "tumpline" - literally, "hangs from head"
   The Twana lexical suffix +i most specifically refers to the forehead region.

2. #bəl+ups   ("stripe" + "tail")   raccoon
   cf Twana bəlayas (#bəl+ayas), raccoon - literally, "striped eyes"
           asbəl', "it has stripes" (as- is the stative aspect marker)

3. #bəl+idgʷas   ("stripe" + "body")   bluebill
   cf Twana asbəl', "it has stripes"
   This Puget Salish duck name refers to the lesser and greater scaups (Aythya
   affinis and marila). The lower, central body portion of these ducks is
   white while the head and neck area, and tail area is black; produces a white
   striped body appearance.

4. s-#c'əl+ič̌   ("stand up" + "back")   backbone
   cf Twana asc' lap, "they're standing up"

5. s-#c'əp'+alič̌   ("submerge in water" + "surface")   swamp
   cf Twana bic'əp'ilas, "the tide is coming in"
   The Puget Salish lexical suffix +alič̌ has the meaning "top, crest, surface"
   (Thom Hess, personal communication).