NOTES ON TSIMSHIAN REDUPLICATION

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The Tsimshianist in attempting a pedagogical application of the analysis of reduplication must question anew the Chomskian notions of competence/description and explanation. The reduplication data are little short of chaotic. There are at least five regular formal types of reduplication. Each of these formal types (declension-conjugations) has both inflectional (plural) and derivational (intensive, iterative, natural species) functions. The formal class membership of any particular lexical item is neither absolutely random nor absolutely determined. The same is true of the morphophonological characteristics of syllable peaks in reduplication. Only in the absence of any pedagogical tactic whatsoever, i.e., only in the memorization of each reduplication, can one achieve total sufficiency. Even a set of phonetically motivated probabilistic statements, the tactic with the greatest sufficiency success, leaves much to be desired.

Speakers of Coast Tsimshian inflect nouns for number (singular and plural) and cause each verb to agree in number with its absolutive, i.e., with its intransitive subject or direct object. Nouns and verbs are divided into at least thirteen lexical classes according to how the plural is indicated. Most of these classes (eight) are semantically marked, i.e., they can be characterized as a group semantically as well as inflectionally, e.g., cyclical temporal entities such as seasons and seasonal activities are pluralized by the prefix gyik-. Gyik- is also a verbal or adverbial proclitic which means "again."

Five of these thirteen inflectional classes, however, are semantically unmarked. These unmarked classes are each defined by a different and particular reduplicative mechanism to express the plural number. Reduplication is probably the ordinary or unmarked way to indicate the plural number for the noun and for the verb agreement.

Reduplication is also used as a derivational device, and as such has multiple semantic function. Leaving aside the semantic intricacies of Tsimshian reduplication, I will focus this paper on the five reduplicative plural classes, on the morphological and phonological determinants of membership in these classes, on the nature of the vowel in the reduplicated affixes, and on the phonological determinants of such vowels.

1. In describing the five reduplication mechanisms, I use the term "model" to refer to that particular syllable in the singular form that is to be copied. The term "copy" refers to the reduplicated plural indicating affix. The term "model release" refers to the first consonant of the model syllable. The term "model arrest" refers to the first consonant after the model's syllabic peak as long as it is part of the same syllable, e.g., /sHunh/ siksHunh (to teach; loan: from "school"); /sH- MODEL; sH- COPY; /-H- MODEL RELEASE; -H- MODEL ARREST/.

The Appendix lists all of the examples of the reduplicative plural that occur in Dunn (1978).

1.1 In the first or CVk- class, the model is the first syllable of the singular form. A copy of the model release is prefixed to the first syllable with an intervening vowel/k/. This is the largest and phonologically most regular of the reduplication classes. CVk- is currently the productive mechanism for plural formation. 

1The first part of this paper, dealing with reduplicative classes, was read at the American Anthropological Association Meetings in Los Angeles in November of 1978. I have included it here because several persons from the Salish Conference have asked to have a written copy and because the second part of this paper, on the nature of the vowel in reduplicated affixes, builds on the first part and was developed out of the discussion of the earlier paper.

2H represents a falling pitch with a concomitant centralizing glide."
Most loan words from English belong to this class. Younger speakers tend to use this mechanism more extensively than older speakers.

1.2 The second or CVk-class, like the CVk-class, uses the first syllable of the singular as the model. A copy of the model release is prefixed to the first syllable of the singular form with an intervening vowel. This reduplicative mechanism may represent a variant of the CVk-class. The k-vowel alternation is a synchronic feature of both Nass-Gitksan and Southern Tsimshian phonology. The CVk-class is small and contains only words with a uvular segment (though the uvular is not always in the model itself).

In these first two classes the model is the first syllable of the singular form. In the remaining three inflection classes the model is the principal syllable and not necessarily the first syllable of the singular form. The principal syllable is the one that carries the word's primary stress.

1.3 In the third or CVC-class copies of the model release and arrest are prefixed directly to the principal syllable. Thus the copy may occur after other prefixes or proclitics in the word. A vowel occurs between the two consonants of the copy. This class, like the first class, is large and fairly regular in its phonology.

1.4 In the fourth or CV-prefix class a copy of the model release is prefixed, with a vowel, directly to the model. This class is smaller than CVk- and CVC- and exhibits greater phonological irregularity.

1.5 In the fifth or CV-infix class a copy of the model release is inserted with a vowel between the syllable peak of the model and the model arrest. This is the smallest and most irregular of the reduplication classes.

The five reduplication classes can be ordered along a three-fold continuum: regular to irregular, common to rare, naive morphological strategy to sophisticated morphological strategy (See Figure 1).

| Large class, | Small class, |
| Regular, | Irregular, |
| Simple morphology, | Complex morphology, |
| Productive, | Not productive. |

Figure 1. The Scaling of Inflection Classes.

1.6 Inflection class membership is morphologically and phonologically conditioned, i.e., certain morphological and phonological characteristics of words predispose them for one class as opposed to another. Some of these predisposing factors are trivial since they are the result of the reduplicative mechanism itself, some are categorial and some are variable. An example of a trivial predisposing factor is the fact that no word belonging to the CVC-class can have a model with an empty or null arrest. There are others, but they are of no theoretical interest and I will omit further discussion of them.

Some categorial or nearly categorial predisposing factors are:

1.6.1 When the model release is p, k, or g (i.e., non-coronal) and when it is part of a consonant cluster, the word belongs to the CV-prefix class.
1.6.2 When the model release is coronal, specifically /l, n or s, and when it is part of a cluster, the word is either CVk- or CVv- class.

1.6.3 No CVC- class words have model initial clusters.

1.6.4 All CVv- class words have at least one uvular segment in the singular form.

The variable factors were derived by the use of the $\chi^2$ test for non-random association from the data summarized in Tables 1 and 2.

<table>
<thead>
<tr>
<th></th>
<th>CVk-</th>
<th>CVv-</th>
<th>CVC-</th>
<th>CV-</th>
<th>-CV</th>
<th>totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>alveolar</td>
<td>51</td>
<td>4</td>
<td>13</td>
<td>11</td>
<td>8</td>
<td>87</td>
</tr>
<tr>
<td>velar/uvular</td>
<td>9</td>
<td>2</td>
<td>22</td>
<td>8</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>laryngeal</td>
<td>18</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>totals</td>
<td>85</td>
<td>11</td>
<td>49</td>
<td>26</td>
<td>12</td>
<td>183</td>
</tr>
</tbody>
</table>

Table 1. Inflection Class Distribution according to Model Release.

<table>
<thead>
<tr>
<th></th>
<th>CVk-</th>
<th>CVv-</th>
<th>CVC-</th>
<th>CV-</th>
<th>-CV</th>
<th>totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>labial</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>alveolar</td>
<td>32</td>
<td>0</td>
<td>35</td>
<td>12</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>velar/uvular</td>
<td>25</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>43</td>
</tr>
<tr>
<td>laryngeal</td>
<td>21</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>6</td>
<td>41</td>
</tr>
<tr>
<td>totals</td>
<td>85</td>
<td>11</td>
<td>49</td>
<td>26</td>
<td>12</td>
<td>183</td>
</tr>
</tbody>
</table>

Table 2. Inflection Class Distribution according to Model Arrest.

1.6.5 The distribution of initial (model release) consonants according to position of articulation is not random ($\chi^2 = 20.05$, $p < .001$) in CVk- class words.

1.6.6 CVk- words tend to have a dental consonant as the model release ($\chi^2 = 8.99$, $p < .01$). 60% of the CVk- class words begin with a dental (alveolar) consonant, 58% of dental initial models occur in CVk- class words.

1.6.7 CVv- words tend not to have velar or uvular consonants as the model release ($\chi^2 = 13.5$, $p < .001$). Only 10% of CVv- class words are velar/uvular initial. Only 21% of velar/uvular initial models occur in CVv- words.

1.6.8 The distribution of model initial sounds according to position of articulation is not random in CVC- class words ($\chi^2 = 19.8$, $p < .001$).

1.6.9 CVC- class words tend not to have alveolar initial models ($\chi^2 = 10.7$, $p < .01$). 27% of CVC- words are alveolar initial, i.e., have alveolar model release. 15% of alveolar initial models occur in CVC- class words.

1.6.10 More velar/uvular initial models occur in CVC- class words than is expected by chance ($\chi^2 = 15.5$, $p < .001$). 45% of CVC- class words have velar/uvular initial models. 51% of velar/uvular initial models occur in CVC- words.

1.6.11 The distribution of model arrests according to position of articulation is probably random in CVk- words.

1.6.12 Models with dental arrest tend to be CVC- class ($\chi^2 = 22.83$, $p < .001$). 71% of CVC- class words have dental arrest models. 44% of dental arrest models occur in CVC- class words.

1.6.13 Models with velar/uvular arrest tend not to occur in CVC- class words ($\chi^2 = 9.38$, $p < .01$). 10% of CVC- class words have velar/uvular model arrest. 12% of velar-uvular arrest models occur in the CVC- class.

Statistical manipulation of these data indicates that there is a preferred syllable structure for reduplications and that this preferred syllable structure acts as a predisposing factor in determining the inflection class membership of lexical items. The preferred syllable structure is CVC- where the syllable release differs in position of articulation from the syllable arrest. 79% of inflectional reduplications have CVC- copies. 91% of CVC- copies (includes CVk- class words) have different position release and arrest. Therefore if the model release is velar/uvular, the
word will tend to be CVc- class. But if the model re-
lease is not velar/uvular, the word will tend to be
CVk- class.

1.7 Part of the explanation of the current distribution
of words in the various inflection classes is most
certainly to be found in the history of the Tsimshian
language and especially in the evolution of its redup-
licative mechanisms. The CV-infix class may represent
surviving relics of the oldest type of Tsimshian re-
duplication. It is the smallest, most opaque and most
irregular of the inflection classes. If the infix class
does represent an archaic morphology, it is clearly
out of sync with the contemporary Tsimshian prefer-
ence for prepositioning inflectional material. Then the
change from CV-infix to CV-prefix makes a logical second
step in this very tentative reconstruction of the his-
tory of Tsimshian reduplication. A third possible step
is the elaboration of the CV-prefix into a number of
allomorphs, e.g., CV- for words with open arrest models,
CVx- for words with uvular segments, CVk- for words be-
ginning with non-velar sounds, and gVC- for words end-
ing in non-velar sounds. In a fourth hypothetical stage
the various allomorphs of the third stage might have
fallen into disuse, with only the CVk- mechanism re-
main ing productive.

A detailed study of the phonological structure of the
data presented in the appendix makes possible the
identification of prototypes for the successive innova-
tions hypothesized in the preceding paragraph.

1.7.1 The change from CV-infix to CV-prefix might be
indicated in
plaks, plf'plaksk exhausted.
The -k and -x arrests have a suppressing (lowering and
backing) effect on preceding vowel. Alternately, their
absence allows the vowel to move forward and up. This
is a synchronic phenomenon in Tsimshian. In the infix-
ing mechanism the copy intervenes between the +back
arrest, allowing the vowel to (re)emerge:
\[
\text{plak} /\text{pla/ksk} + \text{plf}-\text{plaksk}. 
\]
Since the second syllable of the plural has the same
vowel as the singular, the word might have been mis-
analyzed so that the first syllable of the plural was
interpreted as the copy. In this manner a CV-prefix
mechanism might have been established. There are other
words that might have been similarly misinterpreted:
\[
\text{sek}, \text{©iékk bent,} \\
\text{say, sé-say sharp,} \\
\text{wá?a, wáka? dig.} 
\]

1.7.2 The change from a CV- prefix to a CVC- prefix
might be indicated in
gYidák-k, gYaqYidák hip, waist,
gYáyeak, gWa?gYáyeak climb.

These plurals exhibit an assimilatory syllable strengthen-
ing process whereby a non-vowel segment is inserted
between the plural affix and the word:
\[
\ldots gY\ldots gY\ldots+\ldots aye\ldots gY\ldots+\ldots aye\ldots gY\ldots .
\]

This is a synchronic phenomenon in Tsimshian. This
type of assimilatory syllable strengthening may have
led to another misinterpretation whereby two consonant
reduplication arose.

1.8 The most useful pedagogical treatment of the re-
duplicative plural will be one which integrates redu-
plication with the other plural forming strategies.
The student should first learn the semantically marked
plural classes (iteratives, intensives, distributives,
natural species). Then the reduplication mechanisms
should be taught as general, semantically unmarked, ways
to form the plural. The CVk- type should be learned
first with the understanding that it is used most fre-
quently for words beginning with non velar/uvular seg-
ments. Then the CVx- type should be learned as a spe-
cial variant of CVk-. Next the CVC- type should be
taught with the understanding that it is used most often
for words beginning with a velar/uvular sound. This
tactic is revisionistic in that it revives CVC- as a
productive mechanism. The student should be aware of the
fact that the ideal copy syllable involves consonants of
different position of articulation. Throughout this sequence the student must learn the exceptions as irregular forms. Finally the CV-prefix and CV-infix types should be learned, primarily as unusual and irregular forms.

2. The determination of the vowel in the reduplicated copy syllables constitutes one of the most intriguing aspects of Tsimshian morphophonology. There are a number of possible explanations for copy vowels. The vowel might be copied from the model syllable:

\[ \text{CVC} + 1 2 3 1 2 3. \]

The vowel must be reduplicated and then assimilated to the other elements in the copy:

\[ \begin{array}{c|c|c|c} & C & \beta \text{feat} & y \\ \hline \text{a} & V & \text{C} & \text{a} \\ \end{array} + 1 \begin{array}{c|c|c} & C & \beta \text{feat} & y \\ \hline \text{a} & V & \text{C} & \text{a} \\ \end{array} 3 1 2 3. \]

The vowel might be copied from a reduced system of affix vowels, i.e., there might be some type of vowel harmony in reduplicated forms:

\[ \text{stem vowels} \rightarrow \text{affix vowels}. \]

The vowel in the copy syllable might be epenthetic:

\[ \text{CVC} + 1' V' 3 1 2 3. \]

An epenthetic vowel might be assimilated to other elements in the copy:

\[ \begin{array}{c|c|c|c} & C & \beta \text{feat} & y \\ \hline \text{a} & V & \text{C} & \text{a} \\ \end{array} + 1 \begin{array}{c|c|c} & C & \beta \text{feat} & y \\ \hline \text{a} & V & \text{C} & \text{a} \\ \end{array} 3 1 2 3. \]

An epenthetic vowel might be weakened or strengthened because of its co-occurrence with other elements in the copy.

I will discuss each of these possibilities in turn. This discussion will be based on the data from the regular reduplication classes, i.e., 1 (CVk-) and 3 (CVC-) in the appendix.

2.1 Of the 85 CVk- words only 25 have the same vowel in the model and copy (discounting differences in length):

\[ \begin{align*}
\text{akala} & \rightarrow \text{akalak} \\
\text{akala} & \rightarrow \text{akalak}
\end{align*} \]

Of the 49 CVC- words only 11 have the same vowel in the model and copy:

\[ \begin{align*}
\text{a} & \rightarrow \text{a}
\end{align*} \]

Since it will account for only 27% of the data (36/134), the straightforward copying of model syllable vowels appears to have little explanatory value.

2.2 It is possible to increase the amount of data accounted for by assuming the model vowels are copied and then some are assimilated to the consonants in the copy. The vowel i occurs frequently (23/36) in copies that begin with d, t, t, t, or d, i.e., with coronal, non-lateral, non-nasal segments:

\[ \begin{align*}
\text{dikdasx} & \rightarrow \text{sikduunsik} \\
\text{dikdus} & \rightarrow \text{dikduunsik}
\end{align*} \]

Three of these words appear in the lists in 2.1 above. The fronting and raising of vowels after coronal
segments constitutes an assimilation of sorts (high, front & coronal):
\[ V = [+\text{high}]^+[-\text{nasal}] \]
A copy rule along with this assimilation rule will account for 56 of the 134 data items in 1 and 2 of the appendix, thus raising the sufficiency score to 42%.

The vowel a occurs in most copies (22/25) that begin with a laryngeal glide. 20 of these occur in the lists in 2.1 above. The other two are ?ak?oks and ?ay?o·y. These latter two both have an o(-) in the model. The Tsimshian o is an open o and should be considered +low.

The fronting of the 0 in these two words is assimilatory because the glottal stop is both low and -back:
\[ V = [+\text{back}]^+[-\text{back}] \]
This rule only raises the sufficiency score to 43% (58/134).

Words beginning with an uvular have an a in the copy:
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
- k1ak1a·k
Three of these appear in the lists in 2.1. Of the remaining six, four involve models with o and two involve models with a. Only in the latter two is there a clear assimilation:
\[ V = [+\text{back}]^+[-\text{high}] \]
This rule raises the sufficiency score to 45% (60/134).

Most words (10/13) beginning with a lateral have an a for the copy vowel, but this can hardly be viewed as an assimilation:
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k
- 1ak1a·k

2.3 A reduced affix vowel system or some kind of affix-stem vowel harmony is not a possibility because the vowel inventory in the copies is nearly as diverse as that in the models. This fact also excludes as a possibility the reduction of the copied or epenthetic vowels where such reduction would be due to the lack/ reduction of stress.

Four out of eight words beginning with a b or p have an a for the copy vowel, but this is a dissimilatory phenomenon (+anterior \# +back):
- tk1ak1b·d
- tk1ak1b·d
- tk1ak1b·d
- tk1ak1b·d

The major difference between the two vowel systems is that the copy system consists regularly of short vowels only (there is one exception in the data). The e does not occur in CV- or CVC- copies, but it does occur in other reduplication class copies. In any event the e and a are freely varying allophones. There is no straightforward, simple relationship between model and copy vowels, e.g., the model vowel a occurs in words with the copy vowels i, i, a, a, and o. The copy vowel a occurs in words with the model vowels i, a, a, o, and o.

2.4 If one were to assume that the copy vowel is epenthetic and that it is i (the most frequently occurring copy vowel), one could account for only 32% (43/134) of the data.

2.5 The data presented in section 2.2 indicate that the reduplicated affix vowels are in fact epenthetic, i.e., that they depend very little on the nature of the model vowel, and that they are determined primarily by the copy release, i.e., the first consonant of the affix. An expanded statement of the release-vowel dependencies discussed in section 2.2 will account for 68% (91/134) of the data.
of the data:
\[ V + i/\{d,d^2,s,t,l,t^2,y,y^2,k^2,y^y,k^y,g^y,k^w,g^w,w\} \] 
\[ V + a/\{h,\} \] 
\[ V + a/\{l,\} \] 
\[ V + a/\{g,\} \]

Although the sufficiency of such an epenthesis-plus-adjustment tactic is greater than the other possibilities (see Table 3), the phonetic motivation for the copy release/copy vowel associations is hardly apparent.

Table 3. Sufficiency of Possible Vowel Determinants.

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Sufficiency expressed as % of data accounted for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduplication</td>
<td>27</td>
</tr>
<tr>
<td>Vowel harmony</td>
<td>0</td>
</tr>
<tr>
<td>Epenthetic i</td>
<td>32</td>
</tr>
<tr>
<td>Epenthesis w/assimilation, weakening, &amp; strengthening</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 3. Sufficiency of Possible Vowel Determinants.

3. In this section of the paper I explore the possibility that reduplication affix vowels can be explained in terms of strength harmony, i.e., that weak copy vowels occur with weak copy releases and strong copy vowels occur with strong copy releases. In order to discuss this possibility it is necessary to briefly review some of the developments in phonological theory dealing with strength hierarchies and strength parameters.

3.1 James Foley (1977), working in some of the same directions as Theo Vennemann (see e.g., 1972) and Joan Hooper (1976), has identified a number of possibly universal strength parameters whereby human speech sounds are scaled. I will review here only those of his parameters that I find useful for studying Tsimshian reduplication. These are his \( a, p, n, \) and \( w \) parameters. The \( a \) parameter is used to measure a consonant's strength in resisting lenition, i.e., voicing and spirantization (Foley 1977:28-32). Labials resist lenition the best, i.e., are the strongest along the \( a \) parameter. Velars resist lenition least well and are thus weakest along this parameter. In Tsimshian the uvular sounds are more susceptible to lenition than are the velars. I have taken the liberty of adding them to Foley's \( a \) parameter:

![Figure 2](attachment:image.png)
The g has an exp value of 2; the m and l each have an ap value of 7.

The n parameter (Foley 1977:44-48) indicates the tendency for vowels to (among other things) nasalize. Since he sees nasalization as strengthening, the higher the n value the greater the tendency to nasalize and thus the stronger the vowel. The n value scale corresponds to vowel height: the lower the vowel the greater its tendency to nasalize and the higher its n value.

The w parameter (Foley 1977:44-48) measures a vowel's ability to resist elision. Since back vowels undergo elision less frequently than front vowels, back vowels have the higher w value. Figure 3 shows some Tsimshian reduplication copy vowels in the nw grid:

![Figure 3. nw Grid for some Tsimshian vowels.](image)

The i has an nw value of 2; the a has an nw value of 5.

3.2 Table 4 shows the copy release: syllable peak associations found in the data under consideration. It is primarily from this data summary that the following analysis of reduplication affix vowels proceeds.

3.3 This analysis can achieve a greatly improved sufficiency if it posits a progressive and variable assimilation of epenthetic vowels where that assimilation is partly in terms of articulatory features and partly in terms of strength parameters. The epenthetic vowel is assimilated in terms of articulatory features to glides and uvulars; it is assimilated in terms of strength parameters to consonants that agree in height and backness, i.e., [+consonantal, +back, +high].

If the epenthetic vowel is schwa (a), then the copy vowel assimilates nonsonorant glides (? and h) in the

<table>
<thead>
<tr>
<th>vowel</th>
<th>syllable peaks in reduplicated affixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i u o a o o N L</td>
</tr>
<tr>
<td>u</td>
<td>11 1 2 1 - - 1 - - 2 -</td>
</tr>
<tr>
<td>a</td>
<td>23 3 - 10 - - 2 -</td>
</tr>
<tr>
<td>o</td>
<td>2 4 - - 1 - - 1 -</td>
</tr>
<tr>
<td>a</td>
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<tr>
<td>i</td>
<td>2 1 - - 1 - - 1 -</td>
</tr>
<tr>
<td>m</td>
<td>- 1 3 - - 1 - -</td>
</tr>
<tr>
<td>l</td>
<td>- 1 - 6 - - - -</td>
</tr>
<tr>
<td>y</td>
<td>6 2 - 1 - - - -</td>
</tr>
<tr>
<td>w</td>
<td>2 3 - 1 - - - -</td>
</tr>
<tr>
<td>p or h</td>
<td>- - 1 2 22 - - - -</td>
</tr>
<tr>
<td>uvp</td>
<td>- - - - - 9 - - - -</td>
</tr>
</tbody>
</table>

Table 4. Copy release and syllable peak associations.
The raised copy vowel then fronts after (the -back) y 75% of the time:

\[ V_{\text{copy}} + \{\text{high}\}/\{\text{+consonantal}\} \]

\[ \text{high} \]

\[ \text{-back} \], \( f = .75 \).

For the remaining copy releases (segments that are +consonantal, high, back) the affinity between copy release and peak is not to be found in conventional features but rather in similarities in strength. Table 5 shows the \( ap \) and \( nw \) values of affix associated releases and peaks and the frequency (derived from Table 4) of each association:

<table>
<thead>
<tr>
<th>( ap )</th>
<th>( nw )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(velar)</td>
<td>.6875</td>
</tr>
<tr>
<td>3(dental,-lateral, -nasal)</td>
<td>.6053</td>
</tr>
<tr>
<td>5(labial, -nasal)</td>
<td>.2500</td>
</tr>
<tr>
<td>6({}</td>
<td>.5000</td>
</tr>
<tr>
<td>7(m)</td>
<td>.0000</td>
</tr>
<tr>
<td>7(l)</td>
<td>.0000</td>
</tr>
</tbody>
</table>

Table 5. Strength Associations.

The epenthetic vowel \( a(n2) \) is raised, i.e., reduced in \( n \) value if the preceding release is +consonantal, high, back and has an \( ap \) value of less than eight:

\[ a + \{i, t\}/\{\text{velar, dental, labial,}\} \]

nasal, lateral, i.e.,

\[ V_{\text{copy}} + \{\text{+consonantal}\} \]

\[ \text{high} \]

\[ \text{back} \].

If the \( ap \) is seven, the vowel raises in .2381 of the data examples. If the \( ap \) is six, the vowel raises in .5000 of the data examples. If the \( ap \) is five, the raising frequency is .5625. With an \( ap \) of four the raising is .6842. Finally with an \( ap \) of three the vowel raises .875% of the time. The lower the \( ap \) strength of the release, the more likely is the epenthetic vowel to lose \( n \) strength:

\[ V_{\text{copy}} + \{l\}/\{\text{+consonantal}\} \]

\[ \text{high} \]

\[ \text{back} \].

"Reduced," i.e., raised, copy vowels may be fronted if the \( ap \) value of the preceding release is less than seven:

\[ V_{\text{copy}} + i \], i.e.,

\[ V_{\text{copy}} + \{\text{+consonantal}\} \]

\[ \text{high} \]

\[ \text{-back} \].

This vowel fronting, loss of \( w \) value, has a frequency of .5000 if the \( ap \) of the release is six, .2500 when \( ap \) is five, .6053 with 4ap, and .6875 with 3ap, i.e., the lower the \( ap \) strength, the more likely is the raised epenthetic vowel to lose \( w \) strength:

\[ V_{\text{copy}} + \{1\}/\{\text{<7ap}\} \]

\[ f = .6875(\text{ap3}) \]

\[ .6053(\text{ap4}) \]

\[ .5000(\text{ap5}) \]

\[ .0000(\text{ap>6}) \].

3.4 The analysis in 3.3 proposes a number of natural (phonetically motivated) explanations for the realization of vowels in reduplication copy syllables.
analysis is far more sufficient than any of the other possibilities discussed in section 2. Unfortunately it is not the kind of analysis that can provide the student of the language with sufficient competence. There is so much "play" in this analysis that it will be of little help in predicting the plural form of any newly encountered lexical item, that is to say, it claims that there is a great deal more room for variation than has actually been observed. Nevertheless it appears to be the only useful alternative to a burdensome, unstructured exercise in memorization. The teaching application of this analysis will involve setting up the most frequently occurring variants as normal or rule governed. The other variants must then be learned as exceptions. A knowledge of the principles of assimilation and strength harmony might be useful but also dangerous as they could easily lead to an unacceptably large number of overgeneralization errors.

APPENDIX

1. first inflection class (CVk-)
   ʔalá·ys, ʔakʔalá·ys, lary
   ʔalá·skʷ, ʔakʔalá·skʷ, weak
   ʔamálk, ʔakʔamálk, scab
   ʔaná·s, ʔakʔaná·s, skin
   ʔanó·l, ʔakʔanó·l, allow
   ʔap, hakháps, bee
   ʔaqábëx, hakahsóbëx, saw (tool)
   ʔaytk, ʔakʔaytk, call by name
   be·d, bkbé·d, bed
dasë, dikdasë, squirrel
dayš, dikdayš, hammer
du·sk, dikdi·sk, basket
du·s, dikdu·s, cat
dzi·s, dikdzì·s, weir
dzi·ʔ, dikdzì·ʔ, dolphin
gʷsdá·tʰ, gukgʷsdá·tʰ, jacket
gʷisnábë·alə, gukgʷisnábë·alə, button blanket
gə·x, gukgə·x, black bass
go·m, gukgó·m, ashes
ha·ps, hakha·ps, cover
hatəbí·sk, hakahtəbí·sk, knife
hatēpa, hakahtēpa, knife
hatəyí·k, hakahtəyí·k, shore
halo, hakhalo, cloth
huhtk, hukhuhtk, call
la·ʔkw'as, lakla·ʔkw'as, light

*The ʔ represents a high, back, unrounded glide.
lay, loklay, trout
la? abl, lokla? abl, twinkle
libe?ay, loklobi?ay, kidney
lu-t, loklu-t, wedge
lauj, lokla?wel, drip
laat?, laklat?, scraper
laa, siklaa, claw
laq-fi-n, loklaq-fi-no, steep valley
lpun, loklpun, whale
lu?nti, liklu?nti, angry
malik, mokm? lik, tell
mih?ka, mokmih?ka, fragrant
mi鸿ik, mokmi鸿ik, dance
mo?lek, mukm?lek, sour
nolntik, naknul?ik, nest
pi?anan, pi?klinan, barrel
pl?msk, niko?pl?msk, sacred
pl?iosk, pi?kpi?iosk, a square of dried seaweed
so?my, sokso?my, butter clam
seso?, sikseso?, rattle (noun)
seyp, sikseyp, bone
sg?aytk, siksg?aytk, stop
sgyet, siksgyet, spider
skuhnsk, sikskuhnsk, teach
stu-l, sikstu-l, accompany
sweda, siksweda, sweater
syak, siksyak, mat
ta-lag?8-iksa, tikta-lag?8-iksa, stocking
la?al, la?ik?alt, face
la?iksa, la?ik?iksa, whirlpool

These words have multiple class membership.
These words are ambiguous as to class membership.
2. second inflection class (CV~-)

\begin{itemize}
\item \texttt{a·dZaq, a·x~a·dZaq, reach across}
\item \texttt{bé?a~x, báxhé?a~x, tear up}
\item \texttt{da?y~k, daxda?y~k, able}
\item \texttt{dí·y~k, daxdí·y~k, answer}
\item \texttt{gø·mtk, gaxgø·mtk, hope}
\item \texttt{søxayt~k, søsøxt~k, hurt}
\item \texttt{wo·y~k, waxywö·mask, suffer}
\item \texttt{yá·mgask, yaxyá·mgsx, lure}
\item \texttt{yá·y~k, yaxá·y~k, reach}
\item \texttt{ha·y~k, haňhá·y~k, overburdened}
\item \texttt{pa~x, písqá~x, leggings}
\end{itemize}

3. third inflection class (CVC-)

\begin{itemize}
\item \texttt{a·m, am?á·m, good}
\item \texttt{yá·diksk, adá·yá·diksk, arrogant}
\item \texttt{ágwí·léms, agwí·léms, grandchild's spouse}
\item \texttt{ágwig~x, alágwig~x, speak}
\item \texttt{ágwig~y~x, apáq~ágwig~y~x, remember}
\item \texttt{ba·l, bilbá·l, feel}
\item \texttt{bá·y~k, bilbá·y~k, ghost}
\item \texttt{bäsøq, basbäsøq, divide}
\item \texttt{dí·msøq, daxdí·msøq, faint}
\item \texttt{dal, dildal, fight}
\item \texttt{søxdám, daxçqáy, hold fast}
\end{itemize}

\texttt{These words are ambiguous as to class membership.}
4. fourth inflection class (CV-)

daa-lug, didlalug, rebuke
daw, dudaw, ico
dkax, dkaftat, consume
giyack, gaiyiidak, waist, hip
gunik, gunguk, kill
gado, giyado, ask
ha'yin, haheyin, place upright
holk, haboltk, full
ksaw, kaksaw, scraper
ksawhtk, kswshhtk, call out
xa-lik, waqilak, thief
lax, lilax, needle
laxdi, didi, hill
lassayesk, salassayesk, climb
nah, ne'nah, snowshoe
psawin, bapsoin, sea otter
ptal, buptal, rib
pte-ltk, buppte-ltk, climb

These words have multiple class membership.
REFERENCES


How to Get Things Done in Bella Coola:
The Expression of Mood

Philip W. Davis
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In this paper we examine the expression of mood in Bella Coola, a Salishan language spoken on the central coast of British Columbia, Canada.\(^1\) We will consider some of the formal and semantic properties of individual moods, and discuss some of the criteria for the recognition of a system of moods. We will also introduce and detail a complex of roots that function only in conjunction with non-Indicative mood morphology and conclude with an examination of the grammar of mood and some comments on possible historical origins.

Bella Coola has three mutually exclusive morphemes that, when added to stems, have the function of shifting the mood from the Indicative to some other. A morpheme that belongs to this class will be called a Modal. These appear in lieu of the normal Indicative suffixation. Consider the following Intransitive forms:

1. \(\hat{\text{ap}}-\text{?it}\)
   - go-
   - *You can go now*

2. \(\hat{\text{ap}}-\text{na}\)
   - *Try and go*

3. \(\hat{\text{ap}}-\text{nas}\)
   - *Go and find out*

The elements ?it, na, and nas differ in at least two ways from another class of elements that occurs to the right of predicates, viz. Particles.\(^2\) First, Modals do not follow additional morphological expression of Agents as the Particles do.\(^3\) In the third person singular, the Agent is normally marked by -\(\beta\) in the Intransitive, and