A LOWER CHEHALIS PHONOLOGY

by

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CHAPTER ONE

Classification of Lower Chehalis

The Lower Chehalis language,¹ spoken in a limited region of southwestern Washington, is a member of the Olympic Branch of the Coast Division of Salish, a North American Indian language family. Boas classified Salish into Interior and Coast "dialects" and regarded Lower Chehalis and Upper Chehalis as paired main dialects within the Coastal Group, giving Quinault, Humptulips, and Lower Chehalis as subdialects of a main dialect, Lower Chehalis.² Swadesh's classification of the Salish languages, based on the application of lexicostatistic dating to the data from Boas' "Comparative Salish Vocabularies",³ put Lower Chehalis with the "Satsop Group" (that is, Upper Chehalis and Lower Cowlitz) and Quinault as coordinate units within

¹Fieldwork for this project was conducted in the Spring of 1967 by M. Dale Kinkade and by the author during the summers of 1967 and 1968. The project was supported by a National Science Foundation Grant in coordination with the Survey of Linguistic Relationships. During the academic year 1967-1968, further research by the author was made possible by a half-time research assistantship administered by the Department of Anthropology of the University of Kansas.


The shaded area represents the approximate area occupied formerly by the Lower Chehalis.\textsuperscript{4} the Olympic Branch of the Coast Division.\textsuperscript{5} Comparison of the Lower Chehalis materials obtained during the present investigation with data recently made available from Quinault\textsuperscript{6}

\textsuperscript{4}Boas and Haeberlin, \textit{op. cit.}, p. 119.


and from Upper Chehalis suggests that Lower Chehalis and Quinault are more closely related to each other than they are to Upper Chehalis (which Swadesh classified within the "Satsop Group"). Thus it would appear more correct to regard Lower Chehalis and Quinault together as constituting a sub-group of the Olympic Branch.

There may have been as many as five dialects of Lower Chehalis formerly: Copalis, Humptulips, Wynoochie, Grays Harbor, and Willapa. Some of the informants have indicated that Humptulips was a dialect of Lower Chehalis, instead of a separate language; it will be treated in this report as one of the Lower Chehalis dialects, rather than according to Boas' classification. Nevertheless, the exact status of any of the dialects has yet to be determined, with the possible exception of the one(s) represented by the speech of the informants involved in this study.

Current Status of the Language

It is difficult to determine from the population figures that Powell gives how many Lower Chehalis were living at the time of his investigation; but it would

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8This was pointed out to me by Kinkade.
seem that the number was not large.⁹

The figures given by Chafe for the number of remaining speakers of Lower Chehalis appear to be approximately correct.¹⁰ In 1967, only eight persons could be located who avowed knowledge of the language or were reputed to be speakers. From this group the four individuals who served as informants were: Mrs. Nina Charley Bumgarner, of Taholah; Mr. Lewis Hawks, of Bay Center; Mrs. Edna Clark Olsen, of South Bend; and Mr. Claude Waine, also of South Bend.¹¹

The Aims and General Outline of the Report

In view of the fact that Lower Chehalis, like a number of other North American Indian languages, is imminently bound to become extinct within a relatively few years, the importance of recording as much data as possible is quite obvious. The availability of such data is a requisite for comparison with materials from other related


¹¹The average age of the informants at that time was sixty-seven; the oldest informant was sixty-nine, and the youngest was sixty-four.
languages for the purpose of determining the nature of their interrelationships.

Other than the limited information gathered by Teit and Boas around the turn of this century, the only other published sources of Lower Chehalis are some sketchy forms recorded during the 19th Century. For example, Swan lists chett'low "oysters", moo'ser "eyes", nar-whatl "yes", par'nich "ten", and sartl "two", which have been recorded during the present investigation as ġēlêx, mûsu, nax'á ("correct/true"), pā-ščē, and sal, respectively.

The intention of this thesis is to present a description of the phonology of Lower Chehalis based on the items obtained through interviews with the informants during the summers of 1967 and 1968. A thorough description of the language, including a complete statement on the semological component, is not yet possible owing to the lack of sufficient primary data. Although most of the data recorded consist of lexical items, the limited amount

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12 Boas and Haeberlin, op. cit.

13 Swan, James G. The Northwest Coast; or, three years' residence in Washington Territory, Harper and Brothers, New York, 1857, pp. 412-421.


15 One of the main problems encountered during work in the field was the fact that each of the informants has spoken English to the virtual exclusion of Lower Chehalis for many years, and none of them could be considered to be fluent in the latter language.
of textual material which is available provides some information about the morphophonemics of the language.

Chapter Two includes a brief and informal characterization of the phonological component and of systematic phonemics. The chapter also includes an explanation of the distinctive features appearing in the report, the set of fully-specified phonemes of the language, and a short discussion of glottalized sonorants.

The phonological rules which are proposed for the language appear in Chapter Three. Due to the limitations of the field data (see footnote 15), the possibility of determining the syntactic structure to a reasonable extent, and hence the nature of the syntactically-determined phonological rules of the language, has been considerably restricted. In particular, the rules governing the placement of stress, on polysyllabic stems in isolation and on formatives in strings, are presently indeterminable. Throughout the report, forms given in systematic phonemic orthography are marked for primary stress, and phonetic data are marked for primary and, if occurrent, secondary stress.

In Chapter Four, irregular or otherwise unexplainable items in the data are discussed, and there are brief sections on reduplication and on loanwords.

The glossary lists all of the Lower Chehalis forms cited in the text of the report as well as the items from a lexicostatistical word list which it was possible
to elicit. In general, the English glosses are the ones suggested by the informants.

Throughout the report, the orthographic symbols used in the systematic phonemic citation of forms correspond to the phonemic orthography used for Upper Chehalis, except for the following: whereas the symbols /#, /e/, and /o/ are used for Upper Chehalis citations, }, ̃, and ̃, respectively, are employed for the segments to which these symbols correspond in Lower Chehalis.


17 Kinkade, "Phonology and Morphology of Upper Chehalis", op. cit. See especially Part I, pp. 182ff. Not then reported for Upper Chehalis are: ̂, ̃, ̃, ̃ and ̃, but Kinkade now believes these to be necessary for an accurate description of Upper Chehalis phonology (personal communication). A phoneme /e/ is reported for Upper Chehalis; in Lower Chehalis the vowel ̃ is always nonlong.
CHAPTER TWO

The Phonological Component

Although there is a considerable diversity of opinion regarding the precise nature of the phonological component in a generative grammar, there are certain aspects of generative phonology about which there is relative agreement. Specifically, the theory states that for each language there exist phonological rules, or P rules, some of which can be stated in terms of universal interpretive principles and others which must be formulated as language-particular rules. The function of P rules is to derive phonetic representation from the more abstract level of systematic phonemics; thus P rules map structures of one level onto those of another. Furthermore, the P rules constitute an ordered set which apply cyclically, starting with the minimal elements of surface syntactic structure and working "outward" from the innermost constituents (or "upward" if the structure is represented in a tree-diagram) until they are exhausted, i.e., none apply.

19Ibid., p. 424.
Systematic Phonemics and Phonological Redundancy

The level of systematic phonemics is not to be mistaken for one at which all of the predictable phonetic features have been extracted and only the "relative distinctions" are mentioned. The distinction between P rules, which change feature values, and redundancy rules, which state redundancies at the systematic phonemic level, is quite clear. As Stanley has pointed out, however, unless the inputs to the P rules are fully specified matrices, i.e., containing no blanks, specious generalizations can result from the improper use of blanks in which they acquire a "third" value which is neither plus nor minus (or, neither marked nor unmarked, as the case may be).21

Stanley's proposal for Morpheme Structure Conditions represents somewhat of a departure from previous work in generative phonology with regard to redundancy rules. Whereas phonological redundancy has usually been treated within generative phonology by Morpheme Structure rules and Blank Filling rules, each constituting an ordered subset of the P rules, Stanley's argument is that a set of unordered statements about the structure of morphemes---the Morpheme Structure Conditions---is adequate to account for phonological redundancy and that in keeping such statements separate from the phonological rules of a language,
the problems which can arise from having the latter rules apply to matrices that contain blanks are avoided.\textsuperscript{22}

Thus while \( P \) rules change feature values and relate the level of systematic phonemics to phonetic substance, the Morpheme Structure Conditions, quite apart, are statements about the constraints on morpheme segment structure and morpheme sequence structure by which real economy can be achieved in dictionary entries.

The Distinctive Features

The distinctive features employed in this report are defined in Chomsky and Halle.\textsuperscript{23} For the most part they are described in articulatory terms.

Among the major class features are "consonantal" and "vocalic". Consonantal sounds are produced with a radical obstruction in the central region of the vocal cavity; the obstruction must be at least as great as that found in fricatives. Sounds which are articulated without such an obstruction are nonconsonantal.\textsuperscript{24}

Vocalic sounds are produced with an oral cavity in which the most radical constriction is less than that found in fricatives; and the vocal cords are positioned

\textsuperscript{22}Ibid., p. 424.


\textsuperscript{24}Ibid., p. 302.
to allow spontaneous voicing. Sounds which fail to meet one or both of these conditions are nonvocalic.\(^{25}\)

Among the cavity features are "anterior", "coronal", tongue-body features, "rounded", and features involving secondary apertures. The feature "anterior" refers to sounds produced with an obstruction which is located in front of the palato-alveolar region of the vocal tract. Sounds produced without such an obstruction are nonanterior.\(^{26}\)

The feature "coronal" refers to sounds in which the blade of the tongue is raised from its neutral position, i.e., the position of the tongue at rest. Sounds produced with the blade of the tongue in the neutral position are noncoronal.\(^{27}\)

The tongue-body features are "high", "low", and "back". Sounds which are "high" are those which are produced with the body of the tongue raised above the neutral position; sounds produced with the body of the tongue in the neutral position are nonhigh.\(^{28}\)

Sounds which are "low" are produced by lowering the body of the tongue below the neutral position; nonlow

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\(^{25}\)Ibid.  
\(^{26}\)Ibid., p. 304. In consonants the feature "anterior" corresponds to the earlier feature "diffuse".  
\(^{27}\)Ibid. "Coronal" corresponds to earlier "nongrave" in consonants.  
\(^{28}\)Ibid.
sounds are produced without lowering the body of the
tongue from this position. 29

And sounds which are "back" are articulated by
retracting the body of the tongue from the neutral position;
nonback sounds are produced without such a retraction. 30

Sounds characterized by the feature "rounded"
are produced with a narrowing of the lip orifice; sounds
articulated without such a narrowing are nonrounded. 31

Features involving secondary apertures are "nasal"
and "lateral". The production of nasal sounds involves
a lowering of the velum with the effect that the air stream
is directed through the nasal cavity; the velum is raised
in the production of nonnasal sounds so that the air
escapes through the oral cavity. 32

Lateral sounds are produced by lowering the mid
section of the tongue at one or both sides so that the air
escapes over the sides of the tongue; nonlateral sounds
are produced without such a side passage. 33

"Continuant" and "glottalized" are manner of
articulation features. Continuant sounds are produced
with a maximal constriction not exceeding that of

\[\text{Ibid.}, \ p. \ 305.\]
\[\text{Ibid.}\]
\[\text{Ibid.}\]
\[\text{Ibid.}, \ p. \ 316.\]
\[\text{Ibid.}, \ p. \ 317.\]
fricatives; thus the air flow past the constriction in the vocal cavity may be impeded, but it is not blocked. Noncontinuant sounds involve a constriction sufficient to effectively block the air flow.\footnote{Ibid.}

Glottalized sounds are produced by checking the air stream with an upward movement of the glottis, which is compressed or closed. Nonglottalized sounds are produced without such a movement.\footnote{Ibid., p. 323. Chomsky and Halle subsume the feature "glottalized" under "ejection".}

The feature "strident" is one of the source features. Strident sounds are characterized as being "noisier" than nonstrident sounds due to the increased turbulence at the point of articulation in the former.\footnote{Ibid., p. 329.}

Jakobson, Fant and Halle define the prosodic opposition of "long" versus "short" (nonlong) as being based on the relative, rather than absolute, duration of the segments in a given sequence. The duration of long sounds is relatively greater than that of nonlong segments.\footnote{Jakobson, Roman, C. Gunnar M. Fant and Morris Halle. \textit{Preliminaries to Speech Analysis}, The M.I.T. Press, Cambridge, 1951, p. 14.}
The Phonemes of Lower Chehalis

The distinctive feature representation for the systematic phonemes of Lower Chehalis in which each value is specified binarily for every segment as having either a plus or a minus value appears in Table 1.

This representation provides for four major classes of segments (Figure 2): Liquids, which are [+ vocalic + consonant]; Vowels, which are [+ vocalic - consonant]; Consonants, which are [- vocalic + consonant]; and Glides, which are [- vocalic - consonant].

FIGURE 2
The Major Natural Classes of Segments

vocalic

+                   -

<table>
<thead>
<tr>
<th>+</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Liquids Vowels Consonants Glides

Lines leading downward and to the left of the nodes represent plus values; and lines leading to the right represent minus values.
TABLE 1
THE FULLY-SPECIFIED SYSTEMATIC PHONEMES OF LOWER CHEHALIS

<table>
<thead>
<tr>
<th></th>
<th>ɨ ɨ ɨ a ɨ u ɨ i ɨ ə ɨ s ɨ n ɨ ɨ c ɨ t ɨ t ɨ m ɨ m ɨ p ɨ</th>
</tr>
</thead>
<tbody>
<tr>
<td>vocalic</td>
<td>+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +</td>
</tr>
<tr>
<td>consonantal</td>
<td>+ + - - - - - + + + + + + + + + + + + + + + + + + + + + +</td>
</tr>
<tr>
<td>anterior</td>
<td>+ + - - - - - + + + + + + + + + + + + + + + + + + + + + +</td>
</tr>
<tr>
<td>coronal</td>
<td>+ + - - - - - + + + + + + + + + + + + + + + + + + + + + +</td>
</tr>
<tr>
<td>low</td>
<td>- - + - - - - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>back</td>
<td>- - + + + + - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>high</td>
<td>- - - + + + - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>continuant</td>
<td>+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +</td>
</tr>
<tr>
<td>rounded</td>
<td>- - - + + + - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>nasal</td>
<td>- - - - + + - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>lateral</td>
<td>+ + - - - - - + - - - + - - - + - - - + - - - + - - - + -</td>
</tr>
<tr>
<td>strident</td>
<td>- - - - - - - + + - - - + + - - - + + - - - + + - - - + +</td>
</tr>
<tr>
<td>long</td>
<td>- - + - + - - - - - - - - - - - - - - - - - - - - - - - -</td>
</tr>
<tr>
<td>glottalized</td>
<td>+ - - - + - - - - - + + - + - - + - - - + + - + - - + - +</td>
</tr>
</tbody>
</table>

|            | s c c x W x q W q q x W k W k k W k W k W k W k W k W |
| vocalic    | - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| consonantal| + + + + + + + + + + + + + + + + + + + + + + + + + + + + +   |
| anterior   | - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| coronal    | + + + - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| low        | - - + + + + + + + + + + + + + + + + + + + + + + + + + + +   |
| back       | - - + + + + + + + + + + + + + + + + + + + + + + + + + + +   |
| high       | + + + - - - - - - - - + + + + + + + + + + + + + + + + + +   |
| continuant | + - - + + - - - - - - - - - - - - - - - - - - - - + + + + +   |
| rounded    | - - - + + + - - - - - - - - - - - - - - - - - - - - + + + + +   |
| nasal      | - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| lateral    | - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| strident   | + + + + + - - - - - - - - - - - - - - - - - - - - - - - -   |
| long       | - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
| glottalized| + - - - - - - - - - - - - - - - - - - - - - - - - - - - - -   |
The distinctions among the segments of each major class are represented by the tree-diagrams of Figures 3, 4, and 5. The Liquids, Ɂ and Ɂ, are distinguished by their having opposite values for the feature "glottalized".
Although there appears to be a clear notion of "hierarchy of features" in the theory of generative grammar, it is evident that our understanding of this hierarchy is presently deficient. But as Postal points out, even though the "trees" of phonological features which appear in many systematic descriptions are "neither actually a function of any phonological rules nor derivable in any systematic way from the grammar", they do seem to represent some "real facts about the relevant languages", and they "appear
to have much, if certainly not everything in common."\textsuperscript{38}

It should be emphasized that although it is possible to schematize a unique "tree" based on the hierarchy of the phonological features in the matrix (Table 1), a change in the hierarchical arrangement of certain of these features would lead to a different tree. For example, the feature "strident" is redundantly specified for \( \textbf{\textit{g}} \) and all other segments in the matrix except \( \textbf{\textit{i}} \), \( \textbf{\textit{c}} \), \( \textbf{\textit{h}} \), and \( \textbf{\textit{t}} \), for which it is distinctively specified. And each of the segments \( \textbf{\textit{g}} \), \( \textbf{\textit{i}} \), \( \textbf{\textit{c}} \), \( \textbf{\textit{h}} \), and \( \textbf{\textit{t}} \) is distinctively specified for the feature "lateral". (See Figure 6.)

\textbf{FIGURE 6}

\begin{align*}
\text{Redundancy} & \\
\text{lateral} & \text{c, t} & \text{t} & \text{t} \\
\text{strident} & \text{(+) + + - -} \\
\hline
\end{align*}

The value given in parentheses represents a redundant specification.

But if this arrangement were altered so that "strident" preceded "lateral" in the feature hierarchy, it would no longer be possible to construct the tree-diagram in the fashion prescribed by the original matrix; now the segment \( \textbf{\textit{g}} \) would be distinctively specified.

specified for the feature "strident" (as well as for the feature "lateral"), and the specification of values for the feature "lateral" for the segments $\text{t}$ and $\text{t}$ would be superfluous. (See Figure 7.)

FIGURE 7
Reordering Two Features

\[
\begin{array}{cccc}
\text{strident} & + & + & + \\
\text{lateral} & + & - & -
\end{array}
\]

Thus the formulation of a full set of statements concerning phonological redundancy in the language will depend in large part upon determining the proper order in which the distinctive features are arranged.

Additionally, the features may have a different order in different parts of the tree. For example, the feature order might be "low", "back", "high" for vowels, but "back", "low", "high" for consonants. In general, the more even the breaks the fewer the number of specifications that are required. 39

Asymmetry

The inventory of phonological segments in Lower Chehalis is very similar to the system of Quinault 40

39 Hoard (personal communication).
and to that of Upper Chehalis,\textsuperscript{41} although there are some differences. It should be noted that the system is by no means symmetrical. There is no unrounded $x$ to contrast with rounded $x^w$, a contrast that is present among all other back consonants in the system, just as there is no nonglottalized $x$ (except as a possible variant of the glottalized form) to contrast with glottalized $\acute{x}$, a contrast which is found among all other noncontinuant (stop) consonants.

In addition, the contrast between long and nonlong vowels is not present in the segment $\varphi$, which is always nonlong. The contrast between long and nonlong vowels is illustrated by the following examples:

\begin{align*}
\text{taq}^w & \quad \text{[te} \cdot \text{q}^w] \quad \text{"lick"} & \text{paw} & \quad \text{[paw]} \quad \text{"one"} \\
\text{stq\textasciiacute{a}} \text{aq} & \quad \text{[stq\textasciiacute{a} \text{a}q]} \quad \text{"feather"} & \text{lek\textasciiacute{a}} \text{q\textasciiacute{a}} & \quad \text{[lek\textasciiacute{a} q\textasciiacute{a}]} \quad \text{"hair"} \\
\text{s\textasciiacute{a}cet} & \quad \text{[s\textasciiacute{a} \text{c}it]} \quad \text{"belly"} & \text{culp\textasciiacute{a}} \text{q} & \quad \text{[culp\textasciiacute{a} q]} \quad \text{"cow"} \\
\text{smul\textasciiacute{a}} \text{qem} & \quad \text{[smul\textasciiacute{a} qam]} \quad \text{"summer"} & \text{m\textasciiacute{s}em} & \quad \text{[m\textasciiacute{s} \text{s}im]} \quad \text{"sleep"} \\
\text{m\\textasciitilde{s}em} & \quad \text{[m\\textasciitilde{s} \text{\textasciitilde{s}}} \text{im]} \quad \text{"cow"} & \text{mus} & \quad \text{[mus]} \quad - \quad [\text{mos}] \quad \text{"four"}\textsuperscript{42} \\
\text{\textasciitilde{f}\textasciitilde{l\textasciitilde{s}}} & \quad \text{[\textasciitilde{f} \textasciitilde{l\textasciitilde{s}}]} \quad \text{"tomorrow"} & \text{\textasciitilde{p}\textasciitilde{l\textasciitilde{s}}} & \quad \text{[\textasciitilde{p} \textasciitilde{l\textasciitilde{s}}]} \quad \text{"Palix River"} \\
\text{\textasciitilde{\textasciitilde{l}}} & \quad \text{[\textasciitilde{\textasciitilde{l}}]} \quad \text{"eat"}.
\end{align*}

\textsuperscript{41}Kinkade, "Phonology and Morphology of Upper Chehalis: I", pp. 181-182.

\textsuperscript{42}The notation "-" means "alternates freely with".
Glottalized Sonorants

Glottalized sonorants have been attested in several languages in the Northwest: Haida (a member of the Nadene stock), which has ̓, ̕, ̕, ̐, ̑, and ̒; Tsimshian (Penutian stock) and Kwakiutl (Wakashan family), which have ̓, ̕, ̕, ̐, and ̒; and Nootka (Wakashan family), which has ̓, ̕, ̕, and ̐. 43

The status of glottalized sonorants in certain Salish languages has been somewhat of an unresolved problem, although perhaps marginal. Gibson identifies glottalized variants for Quinault which he does not consider as being phonemically distinct from the nonglottalized ones. 44 Vogt states that in Kalispel "many words, nouns and verbs, contain glottalized sonants where no non-glottalized forms exist." 45 In Coeur d'Alene, however, the following glottalized segments contrast phonologically with corresponding nonglottalized ones:
̓, ̕, ̕, ̐, ̒, ̔, ̕, ̐, and ̒. 46


44 Gibson, op. cit.

45 Vogt, Hans. The Kalispel Language, I Kommisjon Hos Jacob Dybwad, Oslo, Norway, 1943, p. 64.

Although there are no minimal pairs among the items in the present Lower Chehalis corpus, there are some sub-minimal contrasts between glottalized Ɂ, ŋ, ŋ̃, ŋ̄, and ŋ̆ and nonglottalized Ɂ, ŋ, ŋ̃, ŋ̄, and ŋ:

(Ɂ/ŋ) Ɇ̃ɉ̃ɒ̃ɛ [Ɇ̃ɉ̃ɒ̃ɛ] "tree bark"/ Ɇ̃ɉ anomal [Ɇ̃ɉ anomal] "ear";
(ŋ/ŋ̃) ʃɪ̃ʧə [ʃɪ̃ʧə] (a character in a story)/ ʃɪ̃ʧəm [ʃɪ̃ʧəm] "old woman";
(ŋ̃/m) Ɇ̃ɒmɛx̃wəs [Ɇ̃ɒmɛx̃wəs] "beads"/ Ɇ̃m̃wən [Ɇ̃m̃wən] "pay";
(ŋ̆/ŋ̃) ʃevi[ʃevi] "cattail"/ ʃiʧən [ʃiʧən] "where?";
(ŋ̆/ŋ̃) sɆəɥwəq [sɆəɥwəq] "belch"/ sɆɊəq [sɆɊəq] "name".

Also, there is some free variation between glottalized and nonglottalized segments, especially among nasals in word-final position. For example:

Ɇ̃ɉ anomal [Ɇ̃ɉ anomal] - [Ɇ̃ɉ anomal] "ear".

Furthermore, a few forms which are cognate in Lower Chehalis and Quinault show a glottalized segment in the former language corresponding to a nonglottalized segment in the latter. For example, Lower Chehalis ɋɛptən [ɋɛptən] "beach" corresponds to Quinault
tepta'n; 
and Lower Chehalis ŋúwał [ŋúwał] "road/path" is cognate with Quinault [ŋúwəl] (phonetically) "road". 

47 Gibson, op. cit., p. 11.

48 From personal field data on Queets, a dialect of Quinault.
CHAPTER THREE

Lower Chehalis Phonological Rules

As mentioned above, the phonological rules of a language are the means of deriving phonetic strings from the more abstract level of systematic phonemic strings. In the theory of transformational grammar, the rewriting rules of the base, in the syntactic component, generate deep structure which consists of pre-terminal strings of labelled and bracketed grammatical formatives. Lexical formatives, each of which consists of a set of phonological, semantic, and syntactic features, are inserted into the strings in accordance with the transformational rules specified by the contextual features belonging to the lexical entries. Just those strings which are well-formed are mapped into surface structure by the sequence of singularly transformations, which "filter out" those strings which do not meet this condition. Surface structure is then given a phonetic interpretation by the rules of the phonological component and a semantic interpretation by the rules of the semantic component.

49 Chomsky, op. cit., pp. 82-90.

The phonological rules of Lower Chehalis appear to be at least partially ordered. If further syntactic information were available, it should be possible to determine the depth of ordering more exactly, if not totally.

Rule (1)\(^{52}\) applies to bisyllabic verb stems in which primary stress falls on the vowel of the second syllable of the base form:

\[
(1) \quad X_1V_1X_2V_2X_3 \rightarrow X_1V_1X_2X_3 \left\{ \begin{array}{c}
\text{+ 'continuative intransitive'} \\
\text{'past'}
\end{array} \right\}
\]

With the addition of the suffix \textit{--\textbf{\text{-}}an} denoting continuative intransitive aspect (\textit{--\textbf{\text{-}}an continuative intransitive}, \textit{--\textbf{\text{-}}an third singular subject}) or in the context 'past', the stress falls on the vowel \(V_1\) of the first syllable of the stem, and the vowel \(V_2\) of the second syllable of the stem is


\[52\] The numbering is simply a means of labelling the rules; it is not meant to imply that the numbers reflect any sort of ordering unless that is specifically stated.

\[53\] + represents morpheme (and in some cases word) boundary; V stands for vowel; and X represents a segment other than a vowel (i.e., a nonvowel).
elided. If \( x_3 \) is a stop, it may be aspirated; otherwise an epenthetic \([\theta]\) may be optionally inserted after \( x_3 \). Examples are:

\[
\begin{align*}
\hat{\mathfrak{a}}_1^\text{54} + \text{qel}éq \ "\text{run (males)}" + \hat{\mathfrak{a}}_1^\mathfrak{w} \rightarrow \hat{\mathfrak{a}}_1^\text{qel}éq\hat{\mathfrak{w}} \ "\text{He is running}"; \\
\hat{\mathfrak{a}}_1^\text{54} + \text{leq}éq \ "\text{cry (males)}" + \hat{\mathfrak{a}}_1^\mathfrak{w} \rightarrow \hat{\mathfrak{a}}_1^\text{leq}éq\hat{\mathfrak{w}} \ "\text{He is crying}"; \\
\hat{\mathfrak{a}}_1^\text{54} + \text{han}és \ "\text{thunder}" + \hat{\mathfrak{a}}_1^\mathfrak{w} \rightarrow \hat{\mathfrak{a}}_1^\text{han}és\hat{\mathfrak{w}} \ "\text{It is thundering}"; \\
\hat{\mathfrak{a}}_1^\text{54} + \text{cáp}áx \ "\text{lighten (referring to weather)}" + \hat{\mathfrak{a}}_1^\mathfrak{w} \rightarrow \hat{\mathfrak{a}}_1^\text{cáp}áx\hat{\mathfrak{w}} \ "\text{It is lightning}";
\end{align*}
\]

\( \mathfrak{t} \) (definite article) + \( \text{yel}éx^\mathfrak{W} \ "\text{find}" + \text{'past'} + \hat{\mathfrak{a}}_1^\mathfrak{w} \) (transitive marker) + \( \hat{\mathfrak{a}}_1^\mathfrak{w} \ "\text{I}" \rightarrow \text{tyel}éx^\mathfrak{W}\hat{\mathfrak{w}} \ "\text{I found it}"; \) and

\( \text{hílu} \) (negative) + \( \hat{\mathfrak{a}}_1^\text{ac} \) (statative aspect) + \( \text{yel}éx^\mathfrak{W} \) + \( \text{'past'} + \hat{\mathfrak{a}}_1^\mathfrak{w} \) (transitive marker) + \( \hat{\mathfrak{a}}_1^\mathfrak{w} \) (transitive marker) + \( \hat{\mathfrak{a}}_1^\mathfrak{w} \) (definite article) + \( \text{taq}á\hat{\mathfrak{a}}_2^\mathfrak{w} \rightarrow \text{hílu} \hat{\mathfrak{a}}_1^\text{acyel}éx^\mathfrak{W} \hat{\mathfrak{w}} \hat{\mathfrak{a}}_1^\text{tat} \hat{\mathfrak{a}}_1^\text{taq}á\hat{\mathfrak{a}}_2^\mathfrak{w} \ "\text{The children have not been found}".

There are a number of other lexica of this type whose function seems to be essentially one of predication. For example:

\( \text{kWet}éx^\mathfrak{W} \ "\text{swell}"; \hat{\mathfrak{a}}_1^\text{ackWet}x^\mathfrak{W} \hat{\mathfrak{a}}_1^\text{a} \ "\text{It is swollen}" \) (-\( \hat{\mathfrak{a}}_1 \) intransitive suffix);

\[
\hat{\mathfrak{a}}_1^\text{54} \hat{\mathfrak{a}}_1 \text{ seems to be a prefix which also signals the continuative aspect in predication. It is, however, optional; thus } \hat{\mathfrak{a}}_1^\text{qel}éq\hat{\mathfrak{w}} - \text{qel}q\hat{\mathfrak{w}} \ "\text{He is running}" \text{, etc.}
\]
nēξēs "be sleepy"; ʔαcnóξςγένq "(Someone) is sleepy" (-γένq lexical suffix);
čalēp "circle/be round"; ʔαcелεπελταm tat ʰενίm "There is a circle around the moon" (čalēp "round/circle around around the moon", -tem ?; ʰενίm "moon"); and
lēp(εl) "low/down/below"; siw ʰαlεp "That is too low!" (siw "too (excessively)", ʰα- ?, ʰαlεp "deep/low").

Rule (2) states that long vowels become short when unstressed:

\[
(2) [+ \text{long}] \rightarrow [- \text{long}] / [+ \tilde{V}].
\]

For example, ʰα-καt "belly", phonetically [ʰα-κιt], but ʰα-κυlεc "intestines" [ʰα-κυlιc]. As a measure of economy in rule application, rule (1) precedes (2); where rule (1) applies, theoretically rule (2) could only apply to \( V_1 \), the zero grade of \( V_2 \), nullifying the possibility of the rule applying to this segment in view of the condition that rules do not apply vacuously.\(^{55}\)

Rule (3) applies to the formation of diminutives and, to a restricted degree, plurals. The rule, given informally in three parts is:

(3a) In the formation of the diminutive of trisyllabic

stems by the addition of the suffix \-_u^\circ\), \(2\) is inserted after the vowel of the stressed syllable of the stem.

(3b) In the formation of the diminutive of bisyllabic stems by the addition of the suffix \-_u^\circ\), \(2\) is inserted after the vowel of the second syllable of the stem.

(3c) In the formation of the diminutive of monosyllabic stems by the addition of the suffix \-_u^\circ\), \(2\) is inserted after the stem vowel.

Condition: the stem cannot contain \(2\) in this position.

If \(2\) does occur in this position, the shape of the stem is not altered.

Exemplary of the application of rule (3a) are the following pairs, the second member of the pair being the diminutive form (or plural, as indicated):

\[
\begin{align*}
\text{lewelmis}^{56} & \quad \text{"Lower Chehalis/Indian" and } \text{lewolmesu} \quad \text{"a young Lower Chehalis person/a young Indian";} \\
\text{sk\-enucico} & \quad \text{"owl" and } \text{sk\-enuciccu} \quad \text{"little owl";} \\
\text{nultalmes} & \quad \text{"person" and } \text{nultalmesu} \quad \text{"teenage boy";} \quad \text{and} \\
\text{talapa} & \quad \text{(?)} \quad \text{and } \text{talapeseu} \quad \text{"wild dog" (?).}
\end{align*}
\]

Some examples of the application of rule (3b)

---

56 This was also recorded as [lewelmis], [lewelmis], and [lewollemis].
to bisyllabic stems are:

syelqínun "slave" and syelqínunu "little slave";
sk'iviún "squirrel" and sk'iviuhnunu "little squirrel";
ceqal "tree" and ceqalnu "sapling";
sqílnenw "woman/female" and sqílnesnu "little girl";
cítan "older brother" and cítanu "adolescent brother";
sna'cem "old woman" and sna'cemmu" "little old woman"; and
lekan "earring" and lekanu "earrings" (-an lexical suffix "ear").

And examples of the application of (3c) to monosyllabic stems are:

xwúkW "small" and xwúkWunu "small one";
man "son" and mánu "small son";
va" old sister" and va"nu "adolescent sister";
sxWuxW "old man" and sxWaxWunu "little old man"; and
nesc "younger brother" and nescumu "little brother".

The application of the rule is blocked when the condition stated in the rule is not met, as in the following:

letí "spoon" and letínu "teaspoon" (rather than
*letínu); and
puos "cat" and pusnu "kitten" (and not *pusnu).

57 See the comment on vowel alternation below.
There are, in addition, a limited number of forms which are not explained by rule (3) and for which there is not enough information at the moment to determine the manner of diminutive or plural formation with a reasonable degree of certainty. For example, the following derivations:

\[x\mathring{a}_q aq\] "child", \[x\mathring{a}_q a\] "children", and \[x\mathring{a}_q u\] "small child";
\[st\mathring{i}_x^w\] "man/male" and \[st\mathring{i}_x^w u\] "young man/boy"; and \[q\mathring{x}_a\] "dog" and \[q\mathring{x}_u\] "dogs" ('small dog'?).

In the case of \[x\mathring{a}_q aq\] and \[st\mathring{i}_x^w\], an extension of rule (3c) to account for the deletion of the second (unstressed) vowel in the derivative formation of the diminutive or the plural might be appropriate, but only if additional data were available to confirm this.

Rule (4) is a rule of assimilation which states that the contrast between rounded and unrounded back consonants adjacent to \(u\) within a morpheme is neutralized, all back consonants being rounded in this position:

\[(4) [+ \text{rounded}] \rightarrow [- \text{rounded}] / \begin{array}{c}
[+ C] \\
[+ \text{back}]
\end{array} \ast \begin{array}{c}
[+ V] \\
[- \text{low}] \\
[+ \text{back}]
\end{array} 59\]

58 This was also recorded as \([q\mathring{x}_a]\).

59 The notation \(\phi \rightarrow \gamma/\alpha/\beta\) is an abbreviation of two (rules involving) symmetric environments: 1) \(\phi \rightarrow \gamma/\alpha\beta\), and 2) \(\phi \rightarrow \gamma/\beta\alpha\).
The contrast between rounded and unrounded back consonants is maintained when adjacent to other vowels. For example:

\[ \text{xá"qa} \] "children" versus \[ \text{xWaq} \] "all";
\[ \text{xes} \] "bad" versus \[ \text{yex} \] "daylight";
\[ \text{sqi\'nel} \] "woman/female" versus \[ \text{qWiq} \] "green/yellow";
\[ \text{qel} \] "sweet" versus \[ \text{qeh\'mel} \] "write";
\[ \text{spaq} \] "flower" and \[ \text{qaq\'as} \] "salt/salty" versus \[ \text{Waq} \] "raven"; and
\[ \text{k\'en\'c\'u\'c} \] "Canadian" versus \[ \text{k\'\'an} \] "hold/grasp".

Therefore it seems unlikely that all of the underlying back consonants adjacent to \( u \) are systematically rounded. But because of the indeterminacy of the systematic value for the feature "rounded" in this case, all segments which are subject to rule (4) are treated, according to the phonetic output, as though they were in fact systematically rounded.60

There are a number of instances of alternation between \([\mathbf{\text{l}}]\) and \([\mathbf{\text{l}}]\) in several items in the corpus, but it is unclear what the exact circumstances leading to this alternation are. Some examples are (phonetically):

\[ \text{[pá\'\'ni]} \] "bark (dogs)" and \[ \text{[ipá\'\'nîn]} \] "barking";
\[ \text{[q\'\'hîmil]} \] "write" and \[ \text{[q\'e\'hîmilîn]} \] "writing";
\[ \text{[sú\'\'mil]} \] "be sick/vomit" and \[ \text{[sí\'sú\'mîlin]} \] "'being' sick";

60 Additional morphophonemic information could reduce the problem considerably; for example, there is evidence that some phonetic \([\mathbf{\text{u}}]\)'s are systematically derived from phonemic \( e \) occurring between rounded velars. (This was pointed out to me by Kinkade.)
and \([p\dot{\text{a}}\text{t}\text{m}i\text{i}]\) "weave (baskets, etc.)" and \([\text{t}i\text{p}\dot{\text{e}}\text{t}\text{m}i\text{l}i\text{n}]\) "weaving".

The evidence is insufficient to determine whether the alternation is syntactically determined merely by the presence or absence of \(-\text{en}\) (third singular subject) or whether the conditioning factors are more general than this.

Furthermore, the contrast between glottalized and nonglottalized liquids, nasals, and nonlow glides following a long vowel within a morpheme is neutralized, all of the former segments being glottalized in this position. For example: \(\text{p\dot{a}}\text{\'n}\text{e}\) "bark (dogs)", \(\text{\'le}\text{\'s}\) "tomorrow", \(\text{s\text{\'m}\text{\'n}\text{e}}\) "mountain", etc. It is unclear whether this is strictly a sequence constraint and that all of the underlying segments are systematically glottalized or whether long vowels have the capacity to glottalize these segments in this context.

**Low Level Phonological Rules**

There is considerably more variation in the articulation of vowels than there is in the production of liquids, consonants, and glides in Lower Chehalis. And among the vowels, the production of the segment \(\v\) is the most variable.\(^{61}\)

---

\(^{61}\)Aert H. Kuipers mentions a similar phenomenon in Squamish (Coast Salish) in *The Squamish Language*, Mouton and Company, The Hague and Paris, 1967, p. 25: "The Squamish vowels—especially /e/—show more variation than the consonants, and they may vary mainly in the function of the latter."
The description of certain phonological processes involving systematic vowels will necessitate the introduction of the feature "tense", which is a manner of articulation feature. (See Figure 8.) Tense sounds are produced with greater articulatory effort than nontense (lax) ones. Tense vowels in particular are executed with a greater deviation from the rest position of the vocal tract during which the articulatory configuration remains stationary.62

FIGURE 8
The Values of Vowels for the Feature "Tense"

\[
\begin{align*}
& \text{a} \cdot & \text{a} & \cdot & \text{u} & \cdot & \text{u} & \cdot & \text{i} & \cdot & \text{i} & \cdot & \text{e} \\
& \text{tense} & \cdot & - & + & + & + & + & - \\
\end{align*}
\]

The systematic high vowels are thus [+ tense] and the systematic nonhigh vowels are [- tense].

Furthermore, it will be necessary to assign gradient values to the allophones of each systematic vowel in order to formulate some of the phonological processes in terms of gradience rules. (See Figure 9.) The phones associated with the segment a are [a, a ə]; those with u are [u o ɔ]; those with i are [i e ɛ]; and

---

The ones with $a$ are $[\dot{a} \, o \, A \, 1 \, u]$. The phones that belong to the segments $u$ and $i$ are in all cases $[+$ tense$]$ in contrast to those that belong to the segments $a$ and $o$, which are $[-$ tense$]$. (See Figure 8.)

**FIGURE 9**

Gradient Values

<table>
<thead>
<tr>
<th>0 back</th>
<th>1 back</th>
<th>2 back</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 high</td>
<td>1 high</td>
<td>2 high</td>
</tr>
<tr>
<td>2 high</td>
<td>e high</td>
<td>e high</td>
</tr>
<tr>
<td>1 high</td>
<td>e high</td>
<td>e high</td>
</tr>
<tr>
<td>0 high</td>
<td>a high</td>
<td>a high</td>
</tr>
</tbody>
</table>

Rule (5) applies to vowels adjacent to low consonants. The first part of the rule, (5a), specifies that the segments $u$, $u$, $i$, and $i$ are phonetically $[o]$, $[o]$, $[e]$, and $[e]$, respectively, in the context stated:

$$(5a) \ [+ \text{ high}] \rightarrow [- \text{ high}] / [+ V] / [+ C]$$

Applying the rule:

- **stiqiw** "horse" is phonetically $[steq\acute{e}w]$;
- **sk\text{w}\text{x}s** "blue huckleberry" is $[sk\acute{e}\text{w}\text{x}s]$;

$63[1]$ and $[\nu]$ will be discussed below. The allophones of long vowels are of distinctively longer duration than those of corresponding nonlong vowels by definition.

$64$ Or they may be even lower in the given context; thus $u \rightarrow [o - 0]$, $\ddot{u} \rightarrow [o - o]$, $i \rightarrow [e - e]$, and $\ddot{i} \rightarrow [e - e]$. 
sq\textsuperscript{W}u\textsuperscript{O} "drink" is [sq\textsuperscript{W}o\textsuperscript{O}];
\textmd{tuq\textsuperscript{W}} "speak" is [toq\textsuperscript{W}]; and
s\textmd{x\textsuperscript{W}ux\textsuperscript{W}} "old man" is [sx\textsuperscript{W}ox\textsuperscript{W}].

The second part of the rule, (5b), specifies that the segment \( \phi \) is approximately [\( \Lambda \)] in the context stated:

\begin{equation}
(5b) \quad [- \text{low}] \rightarrow [2 \text{low}] / \begin{bmatrix} + V \\ - \text{high} \end{bmatrix} * \begin{bmatrix} + C \\ + \text{low} \end{bmatrix}.
\end{equation}

Applying the rule:

\( \chi\phi\text{ss} "bad" \) is phonetically [\( \chi\phi\text{ss} \)];
\( \text{meq}\phi\text{s} "nose" \) is [\( \text{meq}\phi\text{s} \)];
\( \text{s}\phi\text{plam} "screech owl" \) is [\( \text{s}\phi\text{plam} \)]; and
\( \text{d}\phi\text{et} "burn" \) is [\( \text{d}\phi\text{et} \)].

The articulation of \( \phi \) when adjacent to the segment \( \chi\text{W} \) varies between phonetic [\( \Lambda \)] and [\( \nu \)], taking on the characteristic rounding of \( \chi\text{W} \) in the latter case. For example:

\( y\phi\text{x}\text{W} "daylight" \) may be phonetically [\( y\phi\text{x}\text{W} \)] or [\( y\phi\text{x}\text{W} \)];
\( y\phi\text{e}\text{x}\text{W} "find" \) may be articulated as [\( y\phi\text{e}\text{x}\text{W} \)] or [\( y\phi\text{e}\text{x}\text{W} \)];
and \( \chi\text{W}\phi\text{la}\text{a}\text{o} "hot" \) as [\( \chi\text{W}\phi\text{la}\text{a}\text{o} \)] or as [\( \chi\text{W}\phi\text{la}\text{a}\text{o} \)].

It seems that the factor which distinguishes phonetic [\( \nu \)], representative of the phoneme \( \phi \) in this context, from phonetic [\( \phi \)] (or [\( \phi \)]), representative of the phoneme \( \phi \) under the same conditions, is one of laxity; the segments \( u, u, i, i, \) and \( i \) are relatively tense at all times whereas the articulation of \( \phi \) is in all contexts relatively
nontense.

The third part of the rule specifies that the segments a and a are phonetically [u] and [e], respectively, in the context stated:65

\[(5e) \ [+ \ back] \rightarrow \ [2 \ back] / [+ V] \ / [+ C + lo\w] * [+ lo\w].\]

Applying the rule:

'laq" "good/pretty" is phonetically [laq"];
\(\underline{x}\)s "house" is [x\(\underline{s}\)];
q\(\underline{a}\)\(\underline{w}\)aq "(to) fly" is [q\(\underline{a}\)\(\underline{w}\)aq]; and
\(\underline{x}\)\(\underline{a}\)aq "all" is [\(\underline{x}\)\(\underline{a}\)aq].

Rule (6) applies to nonhigh vowels adjacent to back consonants and back glides which are nonlow. The first part of the rule, (6a), specifies that systematic e is approximately [e] in the stated context:

\[(6a) \ [- \ back] \rightarrow \ [1 \ back] / [+ V] \ / [- vocalic] \ * [- lo\w] \ / [+ back].\]

Condition: the segment [+ V - back - high] cannot be adjacent to a segment which is [+ C + lo\w].66

65 Or they may be articulated somewhat further back (and perhaps somewhat rounded): a\(\ast\) \(\rightarrow\) [\(\underline{a}\) \(\ast\) \(\rightarrow\) [\(\underline{a}\) \(\ast\)] and a \(\rightarrow\) [\(\underline{a}\)].

66 Note that "low consonant" appears in the environment of rule (5). Thus the application of rule (5) to any segment effectively "blocks" the application of rule (6) to the same segment, but not vice versa.
The rule can only apply when the condition stated in the rule is met (and when the context is satisfied). For example:

$k^\text{Wen}$ "hold/grasp", which is phonetically $[k^\text{Wen}]$; $sx^\text{Wentem}$ "white man", which is $[sx^\text{Wentim}]$; and $se^\text{Wic}$ "cattail", which is $[se^\text{Wic}]$.

The condition stated is not met and the application of the rule is blocked in the following:

$q\text{aweq} "(to) fly", which is phonetically $[q\text{awaq}]$; and $\text{te}'\text{wa}'\text{exeq} "Upper Chehalis language", which is $[\text{te}'\text{wa}'\text{exeq}]$. 67

The second part of the rule, (6b), specifies that systematic $a^+$ and $a$ are approximately $[a^+]$ and $[a]$, respectively, in the given context:

(6b) $\begin{bmatrix} + \text{back} \\ - \text{high} \end{bmatrix} \rightarrow \begin{bmatrix} 1 \text{ back} \\ 0 \text{ high} \end{bmatrix} / [ + V ] * \begin{bmatrix} - \text{vocalic} \\ - \text{low} \\ + \text{back} \end{bmatrix}$. Condition: the segment $[ + V + \text{back} - \text{high}]$ cannot be adjacent to a segment which is $[+ C + \text{low}]$.

Applying the rule:

$paw" one" is phonetically $[paw^?]$; $\text{le}'\text{kwat}" hair" is $[\text{le}'\text{kwat}]$; and $\text{\'ipxwa}'\text{an}" (to) hide" is $[\text{\'ipxwa}'\text{an}]$.

67The rule applies to the segment $a$ preceding $k^\text{W}$ in this case but not to the segment $a$ preceding $q$. 
Rule (7) applies to nonhigh vowels adjacent to liquids and nonback consonants and glides. The first part of the rule, (7a), specifies that systematic \( e \) is raised to phonetic \( [\tilde{e}] \) in the appropriate context:

\[
(7a) \quad [- \text{high}] \to [+ \text{high}] / [+ V] \ast \left\{ [+ L] \right\}
\]

\[
[- \text{low}] \ast \left\{ [- \text{vocalic}] \right\} \quad \left[ \begin{array}{c} [- \text{back}] \end{array} \right].
\]

Condition: the segment \([+ V - \text{low} - \text{high}]\) cannot be adjacent to a segment which is \([+ \text{back}]\). 68

The rule can apply only when the condition stated in the rule is met (and when the context is satisfied). For example:

- \( \text{pá’iis “boss/head man”, which is phonetically } [\text{pá’iis}] \)
- \( \text{táméš “earth/soil”, which is } [\text{táméš}] \); and
- \( \text{syélqín “slave”, which is } [\text{syélqín}] \).

The condition stated in the rule is not met throughout, however, in:

- \( \text{k̓ənáʔən (} \text{~k̓ənáʔən) “Take it!”}, which is } [\text{k̓ənáʔən}] \)
- \( \text{ləl̓e̓k̓ “fall/topple”, which is } [\text{ləl̓e̓k̓}] \)
- \( \text{sewíč “cattail”, which is } [\text{sewíč}] \)
- \( \text{ləqán “buy”, which is } [\text{ləqán}] \)
- \( \text{sq̓ʷq̓ čus “forehead”, which is } [\text{sq̓ʷq̓ čus}] \); and
- \( \text{Ḵəς “bad”, which is } [\text{Ḵəς}] \).

68 [+ back] here refers only to consonants and glides. The vowels \( e \) and \( a \) are also [+ back], but morpheme structure conditions rule out the possibility of a morpheme containing a \(*VV\) sequence.
The second part of the rule, (7b), specifies that systematic \( a^\alpha \) and \( a \) are fronted to \([a^\alpha]\) and \([a]\), respectively, in the context stated:\(^{69}\)

\[
(7b) \quad [+ \text{back}] \rightarrow [0 \text{ back}] / [+ V, \text{low}]^{+ \text{L}} \text{ vocalic}^{[- \text{back}]}.
\]

Condition: the segment \([+ V + \text{low} + \text{back}]\) cannot be adjacent to a segment which is \([+ \text{back}].\)

Applying the rule:

- \(\text{sai} \) "two" is interpreted phonetically as \([\text{sai}]\);
- \(\text{s\textacute{a}}\cdot\text{cat} \) "belly" as \([\text{s\textacute{a}}\cdot\text{cat}]\);
- \(\text{pa	extl	extacute{a}}\) "outside (the house)" as \([\text{pa	extl	extacute{a}}]\);
- \(\text{\textl\textacute{a}}\) "three" as \([\text{\textl\textacute{a}}]\);
- \(\text{t\textl\textacute{a}}\) "uncle" as \([\text{t\textl\textacute{a}}]\); and
- \(\text{yav} \) "older sister" as \([\text{yav}]\).

The condition is not satisfied as stated in the rule throughout the following examples:

- \(\text{m\textl\textacute{a}}\text{t}\) "corpse/dead", which is \([\text{m\textl\textacute{a}}\text{t}]\);
- \(\text{t\textl\textacute{a}}\) "Close (it)", which is \([\text{t\textl\textacute{a}}]\);
- \(\text{x\textl\textacute{a}}\text{t}\) "jump/hurry", which is \([\text{x\textl\textacute{a}}\text{t}]\);
- \(\text{q\textl\textacute{a}}\) "water", which is \([\text{q\textl\textacute{a}}]\);

\(^{69}\) Phonetic \([\text{a}]\), which is articulated further forward than phonetic \([a]\), occurs very infrequently. It was observed only in \(\text{lat} \) "very" \([\text{lat}] \sim [\text{la\textl\textacute{t}}]\) and in \(\text{m\textl\textacute{s}\textl\textacute{i}} \) "thank you" \([\text{m\textl\textacute{s}\textl\textacute{i}}] \sim [\text{ma\textl\textacute{s}\textl\textacute{i}}]\).

\(^{70}\) Also recorded as \([\text{x\textl\textacute{a}}\text{t}\text{a}q]\) and \([\text{x\textl\textacute{a}}\text{t}\text{a}q]\).
máqʷəm "meadow", which is [máqʷəm];
xəsq "house", which is [xəsq]; and
xʷaqʷ "all", which is [xʷaqʷ] (or [xʷaqʷ]).

And rule (8) applies to high vowels adjacent to nonlow segments. The first part of the rule, (8a), specifies that systematic i* and i are phonetically [i*] and [i], respectively, in the context stated:

(8a) 
\[
\begin{align*}
\text{- back} & \rightarrow [0 \text{ back}] / [ + V ] \left[ + \text{ high} \right] _\ast \\
+ \text{ high} & \rightarrow [3 \text{ high}] / [ - \text{ low}] 
\end{align*}
\]

Condition: the segment [+ V - back + high] cannot be adjacent to a segment which is [+ low].

Applying the rule:

míqa "grandfather" is phonetically [míqa];
skι̊pxʷa "rabbit" is [skι̊pxʷa]; and
čicəl "short" is [čicəl].

The condition stated in the rule is not satisfied, however, in the following:

qʷicxʷ "Queets", which is phonetically [qʷicxʷ]; and
qic "play (males)", which is [qic].

The second part of the rule, (8b), specifies that systematic u* and u are phonetically [u*] and [u],
respectively, in the stated context:

\[(Sb) \begin{bmatrix} + \text{back} \\ + \text{high} \end{bmatrix} \rightarrow \begin{bmatrix} 2 \text{back} \\ 3 \text{high} \end{bmatrix} \begin{bmatrix} + V \\ (- \text{low}) \end{bmatrix} \ast \]

Condition: the segment \([+ V + \text{back} + \text{high}]\) cannot be adjacent to a segment which is \([+ \text{low}]\).

Applying the rule:

- \(\text{tú}^{\omega}\text{ux}^{\omega}\) "nine" is phonetically \([\text{tú}^{\omega}\text{ux}^{\omega}]\);  
- \(\text{pu}^{\omega}\text{u}^{\omega}\) "cat" is \([\text{pu}^{\omega}\text{u}^{\omega}]\); and  
- \(\text{lūk}^{\omega}\) "high/up/above" is \([\text{lūk}^{\omega}]\).

The condition is not satisfied in:

- \(\text{mūx}^{\omega}\text{en}"\)pay", which is phonetically \([\text{mōx}^{\omega}\text{n}]\); and  
- \(\text{squ}^{\omega}\) "drink", which is \([\text{sq}^{\omega}\text{o}]\).

Optional Phonetic Rules

Rule (9) specifies that systematic \( \text{a} \) may be phonetically \([\text{i}]\) \(71\) when stressed and when adjacent to a palatal segment (\(\ddot{s}, \ddot{c}, \ddot{ç}\)) or to systematic \(\ddot{y}\) and \(\ddot{v}\) provided that it is not also adjacent to a low

---

\(71\) Phonetic \([\text{i}]\), which is articulated relatively high and front, differs from the allophones of systematic \(\ddot{a}\) by the former segment's being nontense and the latter's being tense.
The rule is not obligatory, however, for a may be interpreted as [â] in this context. For example:

\[ tāl'ēč \] "fall/topple" may be either [t̪il'ēč] or [t̪il'ěč];
\[ lēčq̪̆ɣ[̃m] \] "elk/game (quarry)", [l̪̆čq̪̆ɣ[̃m] or [l̪̆čq̪̆ɣ[̃m];
\[ ẙn̪̆s \] "tooth/teeth", [ẙn̪̆s] or [ẙn̪̆s]; and
\[ ẙt̪̆w̪̆a" \] "salmonberry", [ẙt̪̆w̪̆a"] or [ẙt̪̆w̪̆a"].

Moreover, it appears that the vowel must be stressed in order for the rule to apply; a's occurring in this context in unstressed syllables are apparently not subject to the rule:

\[ l̪̆q̪̆b̪̆č \] "beaver" (l̪̆q̪̆(əl) "wide", -b̪̆č suffix "belly")
is phonetically [l̪̆q̪̆b̪̆č];
\[ ç̪̆n̪̆p̪̆úst \] "oyster tongs" is [ç̪̆n̪̆p̪̆úst]; and
\[ w̪̆s̪̆ẙw̪̆ps \] ",(sprig or widgeon ?) duck" is [w̪̆s̪̆ẙw̪̆ps].

**Rule (10)** states that in a sequence of vowel followed by "glottal stop" followed by nonvowel (any segment other than a vowel) within a word, an ephemeral "echo" vowel may intervene between the glottal stop and
The epenthetic echo vowel has the same feature-values as the full vowel except, of course, that the echo vowel is by its transient nature nonlong in all cases.

The contrast between full vowels and echo vowels in this context is quite clear. The duration of the unstressed vowel of each of the following examples is constant with that of unstressed vowels in general:

\[ + V \] [ + G ] \{ [+ consonantal] \} \[ [- vocalic] \]

In contrast, the duration of the echo vowel is markedly transient in the following forms:

\[ + V \] [ + G ] \{ [+ consonantal] \} \[ [- vocalic] \]
involving the insertion of the segment 2:

\[ \text{yay} \] "older sister" [y\text{a'y}] vs. \[ y\text{á}y\text{yu} \] "adolescent sister [y\text{á}'\text{a'yu}];

\[ n\text{esē} \] "younger brother" [nīsē] vs. \[ n\text{á}'\text{scu} \] "little brother" [n\text{á}'\text{a'scu}];

\[ m\text{ān} \] "son" [mān] vs. \[ m\text{á}'\text{nu} \] [m\text{á}'\text{a'nu}] "small son";

\[ l\text{ā}s\text{āqē} \] "Stand up!" [l\text{ā}'\text{a'sāqē}] vs. \[ l\text{ā}'\text{a}s\text{āqē} \] "You all stand up!" [l\text{ā}'\text{a}s\text{āqē}]; and

\[ p\text{ā'stān} \] "white man" [pā'stān] vs. \[ s\text{pā'stān} \] "white woman" [sp\text{á}'\text{a'stān}].

Rule (11) states that post-velar (low) consonants which are valued as plus glottalized may be affricated rather than glottalized; and the rule specifies that the continuant which follows the stop segment in this case is valued identically as the stop except that the latter is noncontinuant:

\[(11)\begin{align*}
+ C & \quad + C & \quad + C \\
+ \text{low} & \quad + \text{low} & \quad + \text{low} \\
(- \text{continuant}) & \Rightarrow & (- \text{continuant}) \\
\alpha \text{ rounded} & \quad \alpha \text{ rounded} & \quad \alpha \text{ rounded} \\
+ \text{glottalized} & \quad - \text{glottalized} & \quad (- \text{glottalized})
\end{align*}\]

For example:

\[ \text{qāpē}s \] "soft/suave" may be articulated as \([\text{q}\text{w}\text{pē}s]\) or as \([\text{q}\text{w}\text{pē}s]\); \[ \text{sq}\text{w}\text{u}\text{x}\text{W} \] "smoke" as \([\text{s}\text{q}\text{w}\text{o}\text{x}\text{W}]\) or as \([\text{sq}\text{w}\text{w}\text{o}\text{x}\text{W}]\); and \[ \text{ulqō} \] "snake" as \([\text{ulqō}]\) or as \([\text{ulqā}]\).

Rule (12) states that nonglottalized stop
(noncontinuant) consonants, particularly post-velars, may be aspirated (tensed) when no other segment follows (as in utterance-final position):

\[(12) \ [-\text{tense}] \rightarrow [+\text{tense}] / [+ C \begin{array}{l}
+ \text{low} \\
- \text{continuant} \\
- \text{glottalized}
\end{array} ] \#\]

For example:

\[\chi\rho\gamma\varepsilon\sigma] \ "dry" \ may \ vary \ between \ phonetic \ [\chi\acute{\rho}\gamma\lambda\varepsilon] \ and \ [\chi\acute{\rho}\gamma\lambda\varepsilon\hbar] \; \text{and} \]
\[\acute{\alpha}\cdot\acute{\varepsilon}\sigma] \ "snow" \ between \ [\acute{\alpha}^{\acute{\alpha}}\cdot\acute{s}\lambda\varepsilon] \ and \ [\acute{\alpha}^{\acute{\alpha}}\cdot\acute{s}\lambda\varepsilon\hbar] .\]

Finally, the sequence \textit{sy} may be articulated as \[\text{sy}\] or as \[\text{s}\], though the former is more general: \footnote{72}{There \ is \ no \ evidence \ to \ indicate \ how \ the \ rule \ would \ apply \ to \ \textit{sy}.}

\[(13) \begin{bmatrix}
+ \text{C} \\
+ \text{ant} \\
+ \text{cor} \\
+ \text{cont}
\end{bmatrix} \begin{bmatrix}
+ \text{G} \\
- \text{bak} \\
+ \text{high}
\end{bmatrix} \begin{bmatrix}
+ \text{C} \\
- \text{ant} \\
+ \text{cor} \\
+ \text{cont}
\end{bmatrix} \rightarrow \begin{bmatrix}
+ \text{C} \\
- \text{lal} \\
+ \text{cont}
\end{bmatrix} \]

For example:

\[\text{syel}^{W}\chi] \ "whale" \ may \ be \ rendered \ phonetically \ as \ [\text{syel}^{W}\lambda\chi] \ or \ as \ [\text{sl}^{W}\lambda\chi]; \ \text{and} \]
\[\text{syel}^{W}\varepsilon\chi] \ "slave" \ as \ [\text{syel}^{W}\iota\varepsilon\chi] \ or \ [\text{sl}^{W}\iota\varepsilon\chi] .\]
Summary of the Rules

To recapitulate, the phonological rules proposed for Lower Chehalis are the following:

(1) \( x_1v_1x_2\hat{v}_2x_3 \rightarrow x_1\hat{v}_1x_2x_3 / \begin{cases} - & + 'continuative intransitive' \\ - & 'past' \end{cases} \)

which applies to bisyllabic verb stems in which primary stress falls on the vowel of the second syllable of the base form. In the appropriate context, the stress falls on the vowel \( (V_1) \) of the first syllable of the stem, and the vowel \( (V_2) \) of the second syllable of the stem is elided;

(2) \([+ \text{ long}] \rightarrow [- \text{ long}] / [+ \hat{v}] \)

which states that long vowels become short when unstressed;

(3), which applies to the formation of diminutives and, to a restricted degree, plurals of mono-, bi-, and trisyllabic stems (cf. pp. 27-28);

(4) \([- \text{ rounded}] \rightarrow [+ \text{ rounded}] / \begin{cases} + c \\ + \text{ back} \end{cases} \begin{cases} + v \\ - \text{ low} \end{cases} \begin{cases} - & \text{ back} \end{cases} \)

which states that back consonants are rounded when adjacent to \( u \cdot \) and \( u \) within a morpheme;
which states that systematic high vowels are lowered, that systematic α is lowered, and that systematic low vowels are articulated further back adjacent to low consonants;

\[
\begin{align*}
(5) & 
\begin{array}{c}
[+ \text{ high}]  \\
[- \text{ low}]  \\
[+ \text{ back}]  \\
\end{array} & 
\rightarrow & 
\begin{array}{c}
[- \text{ high}]  \\
[2 \text{ low}]  \\
[2 \text{ back}]  \\
\end{array} / 
\begin{array}{c}
[+ \text{ V}]  \\
[- \text{ high}]  \\
[+ \text{ V}]  \\
[+ \text{ low}]  \\
\end{array} * 
\begin{array}{c}
[+ \text{ C}]  \\
[+ \text{ low}]  \\
\end{array}
\end{align*}
\]

Condition: the vowel cannot be adjacent to a low consonant,

which states that systematic α is articulated mid-central and systematic α and low-central in the appropriate context if they are not also adjacent to a low consonant;

\[
\begin{align*}
(6) & 
\begin{array}{c}
[- \text{ back}]  \\
[- \text{ high}]  \\
[+ \text{ back}]  \\
[- \text{ high}]  \\
\end{array} & 
\rightarrow & 
\begin{array}{c}
[1 \text{ back}]  \\
[2 \text{ high}]  \\
[1 \text{ back}]  \\
[0 \text{ high}]  \\
\end{array} / 
\begin{array}{c}
[+ \text{ V}]  \\
[- \text{ vocalic}]  \\
[+ \text{ V}]  \\
[- \text{ low}]  \\
\end{array} * 
\begin{array}{c}
[+ \text{ back}]  \\
\end{array}
\end{align*}
\]

Condition: the vowel cannot be adjacent to a segment which is [+ back],
which states that systematic \( \varepsilon \) is raised and that systematic low vowels are fronted adjacent to liquids and nonback consonants and glides if they are not adjacent to a back segment;

\[
(8) \quad \begin{bmatrix} [- \text{ back}] & \Rightarrow & [0 \text{ back}] & / & [+ V] & [- \text{ low}] \\
+ \text{ high} & & [3 \text{ high}] & / & [\_ \_ \_] & *[\_ \_ \_]
\end{bmatrix}
\]

Condition: the vowel cannot be adjacent to a low segment,

which states that systematic high vowels are articulated high if and only if they are in the context of nonlow segments;

\[
(9) \quad [- \text{ back}] \Rightarrow [0 \text{ back}] / \begin{bmatrix} [+ V] & \_ \_ \_ \\
- \text{ low} & \_ \_ \_ \\
- \text{ high} & \_ \_ \_ \\
\end{bmatrix} \quad \begin{bmatrix} [+ C] & \_ \_ \_ \\
- \text{ anterior} & \_ \_ \_ \\
[+ \text{ coronal}] & \_ \_ \_ \\
[+ G] & \_ \_ \_ \\
- \text{ back} & \_ \_ \_ \\
[+ \text{ high}] & \_ \_ \_ \\
\end{bmatrix}
\]

Condition: the vowel cannot be adjacent to a low consonant,

which states that systematic \( \varepsilon \) may be phonetically \([I]\) when stressed and when adjacent to a palatal segment or to systematic \( \varepsilon \) and \( \varepsilon \) provided that it is not also adjacent to a low consonant;
which states that in a sequence of vowel followed by glottal stop followed by a segment other than a vowel within a word, an ephemeral echo vowel may intervene between the glottal stop and the nonvowel;

which states that glottalized low consonants may be affricated rather than glottalized;

which states that a nonglottalized low stop consonant may be aspirated when no other segment follows; and

which states that systematic s + y within a word may
be articulated as [s].

Rules (5)-(9) are low level rules; and rules (10)-(13) are non-obligatory rules (i.e., alternate realizations are possible). Of the optional rules, (10) and (11) are much more general in terms of actual realizations than the others are.

Rule Application

The relevance of having the phonological statements apply in the order indicated above should become clear when a number of items are subjected to the sequence of rules. In working from the abstract systematic phonemic level to the level at which the phonetic output is attained, only those statements which are relevant to the items being described are mentioned.

The derivation of ʼiqeśiqw'ęn tăqan tə xʷúʔkʷu

"That little boy is running" is:

\[ ʼ1- + qeśēq + ṭə + ən + tăqan + tat + xʷúʔkʷu + ṭə \]

\[ \rightarrow ʼiqeśiqw'ęn tăqan tə xʷūʔkʷu \] by rule (1)
\[ \rightarrow ʼiqeśiqw'ęn tăqan tə xʷūʔkʷu \] by rule (3)
\[ \rightarrow eqA:q1'-an tăqan tə xʷūʔkʷu \] by rule (5)
\[ \rightarrow eqA:q1'-an tăqan tə xʷūʔkʷu \] by rule (6a)
\[ \rightarrow eqA:q1'-an tăqan tə xʷūʔkʷu \] by rule (7)
\[ \rightarrow eqA:q1'-an tăqan tə xʷūʔkʷu \] by rule (8b)
\[ \rightarrow \left[ eqA:q1'-an tăqan tə xʷūʔkʷu \right] \] by rule (10).
And the derivation of \( \text{lak}^{W} \text{a'én tit cúlq'ans lec} \text{xá'eq} \) "Wipe the little girl's tears off!" is:  

\[
\text{lak}^{W} + -\text{a'én} + \text{tit} + \text{cúlq} + -\text{ens} + \text{lec} + \text{xá'eq}
\]

\[
\rightarrow \text{lak}^{W} \text{a'én tit cúlq'ans lec xá'eq} \quad \text{by rule (5)}
\]

\[
\rightarrow \text{lak}^{W} \text{a'én tit cúlq'ans lec xá'eq} \quad \text{by rule (6a)}
\]

\[
\rightarrow \text{lak}^{W} \text{a'ín tit cúlq'ans lec xá'eq} \quad \text{by rule (7a)}
\]

\[
\rightarrow [\text{lak}^{W} \text{a'ín tit cúlq'ans lec xá'eq}] \quad \text{by rule (8)}.
\]
CHAPTER FOUR

Vowel Alteration and Reduction

A number of things among the data are not accounted for by the phonological rules in the preceding chapter and for which there is insufficient information at the present time to explain. Among these are vowel alternations in such pairs as:

snációcem "old woman" and snáçca?muʔ "little old woman";  
sxWuxW "old man" and sxWaxWu "little old man";  
n̓esč "younger brother" and n̓esčuʔ "little brother"; and  
pásten "white man" (<English 'Boston', possibly through Chinook Jargon) and spástanl "white woman".

In addition there is not yet sufficient material to characterize the processes which govern the reduction or elision of certain unstressed vowels and the loss of certain nonvocalic segments in unstressed syllables or particles from the canonical forms. For example:

xWátaq "jump/hurry" was recorded as [xWátaq], [xWátAq], and [xWátaq].

Although the unstressed vowel of -čap "fire" is not reduced in Ɂapayčapte "axe", it may be reduced to a zero grade in méčen "fire", phonetically [méčп] or [míčp] (or [míčp]), and in sxWačap "wood", phonetically [sxWáčap] or [sxWáčp]. As two of several examples of the loss of a nonvocalic segment from an unstressed form,
tit ʔikʷtaqtém "(Something) was stolen" was recorded as [titikʷtaqtém] and [təʔikʷtaqtém]; and wáwi laqʷ tat ləkʷátens tat xáʔaq "That boy has very nice hair" was recorded as [wáwi laqʷ taʔləkʷátens tat xēʔaq] and as [wáwi laqʷ tələkʷátens tat xēʔaq].

Reduplication

In general, the pattern of reduplication is that the reduplicated item follows the stem on which it is formed (and it is unstressed). Most of the reduplicated forms recorded express, as the term suggests, some form of reiterative activity. For example:

kʷaw "chew", kʷayan "chewing", and kʷawɪkʷayan
"continually chewing";
kʷiw "crawl" and kʷiwkʷiwí "crawl around (as when picking berries)";
*ceíxʷc "drip", ʔiceíxʷcwen "dripping", and ʔiceíxʷceíxʷcwen
"continually dripping";
čəpáx "lighten", ʔicəpáxʷcwen "lightning", and ʔicəpáxčəpáxʷcwen "continually lightning";
ɣilíʔ "walk" and ɣilíyíʔ "walk around";
tukʷ "bite" (also recorded as [teʔkʷ]) and tukʷtukʷ
"spicy/pepper"; and
yəxʷ "daylight" and yəxʷáxʷyəxʷáxʷyen "blinking lights" (?).

Other reduplicated forms do not suggest the idea
of repetitious activity so clearly:

\( x^{W} \text{átag} \) "jump/hurry", \( x^{W} \text{átaga} \) "Jump/Hurry!", and

\( x^{W} \text{átx} \text{átaga} \) "Hurry up!" (-a imperative);

\( k^{W} \text{alik} \text{áli} \) "mouse";

\( k^{W} \text{ik} \text{íyanst} \) "straight pin" (recorded as \( [k^{W} \text{ik} \text{íya} \text{nst}] \));

and \( \text{músmus} \) "cow".

Although certain details remain to be explained, the pattern of reduplication is generally clear. It is not entirely clear, however, how the rules must be revised to account for it.

**Loanwords**

It is probably best to enter loanwords in the lexicon with the specification that they are not in fact native items. Although some loanwords such as \( ŕûk^{W} \text{e} \) \( [šûk^{W} \text{e}] \) "sugar", \( kápi \) \( [kápi] \) "coffee", and \( \text{mustk}^{W} \text{áta} \) \( [\text{mustk}^{W} \text{áte}] \) "silver dollar" (\( \text{mus} \) "four", \( \text{t} \) indefinite article) conform to the phonological patterning of the native vocabulary, a good many others violate native root patterns and/or phonetic rules. For example:

- \( \text{lipoá} \) "peas", which is phonetically \( [\text{lipoá}] \);
- \( \text{sántihem} \) "get dressed up", which is \( [\text{sántihem}] \); and
- \( \text{úlman} \) "old man", which is \( [\text{úlman}] \).

**Conclusion**

The addition of further material to the present corpus would probably bring about the need to expand the
phonological rules stated above. Additionally, future comparative studies will most likely reveal historical processes which are not now evident. For example, in comparing Lower Chehalis \( \textpare{paq} \) "brown" with Quinault \( \textpare{paq} \)\(^73\) "gray", Lower Chehalis \( \textpare{c'éap} \) "fire" with Quinault \( \textpare{W'atoup} \)\(^74\) "burn", and Lower Chehalis \( \textpare{Welá'n} \) "ear" with Quinault \( \textpare{Welá'n} \),\(^75\) there is good reason to believe that under certain conditions the segments which have developed into Quinault \( o, u \) and \( e \) merged into \( a \) in Lower Chehalis. Correspondences such as these suggest the existence of historical rules which must be revealed before a thorough phonological description of the language can be accomplished.

\(^{73}\)Gibson, op. cit., p. 22.

\(^{74}\)Personal datum. Cf. footnote 48.

\(^{75}\)Ibid.
BIBLIOGRAPHY


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GLOSSARY OF FORMS CITED
A
all
animal; insect; misbehaved
definite article
definite article (feminine)
indefinite article
ashes
axe

B
bad
bark (dogs)
bark (tree)
beach
beads
beaver
belch
belly
belly, lexical suffix
big
bird
bite
black
blood
blow; breathe
blow (wind)
bone
boss; head man

teenage boy

breast (woman's)

older brother

adolescent brother

little brother

younger brother

brown

burn

buy

c

Canadian

cat

cattail

(a character in a story)

chew

continually chewing

child

small child

children

circle; be round

circle around the moon; round

close

cloudy; foggy

coffee

cold

come

á·lés

nułtá'olmešu

qámten

čít(an)

číta'nu

ña'scu

naččę

čespeq

q'et

leqén

kenčucción

pu'ôte

seńće

snícça

kwą́y

kwą́'kwą́yen

xa'qaq

xa'quçō

xa'qačō

celą́p

célpęł

tak

pětk

kápi

pamás

"ihs
continuative intransitive
continuative aspect marker
cook
corpse; dead
correct; true
cow
crawl
crawl around
cry (females)
cry (males)
cut

dance
day
daylight
blinking lights (?)
die
dig; clams
diminutive; plural
dirty
dog
dogs (?)
wild dog (?)
silver dollar
get dressed up
drink

-w-
°i-
°uq w's; q'wel ~ q'wel;
q'wik; k'uk
makwat
nax w'al
culpalq; músmus
k'iw
k'iwk'iw?l
°uk w ~ suk w
k'iqsi
°wil
laq w'seq
sk wel
γex w
γax wγex wγex wγex w'w'en
'atem
ciq wú's
-u'
q'wic'el
qáx'a
qáx'u
telá pes'u
mustk wáta
sántihem
sq w'u
drip
continually dripping
dry
duck (sprig or widgeon?)
dull

E
ear
ear, lexical suffix
earring
earrings
earth; soil
eat
chicken egg
fish egg
'cured' salmon eggs
eight
elk; game (quarry)
eye; four
eyes

F
fall; topple
fall backward (females)
fall backward (males)
fall overboard
far
fat; grease
father
fear; frighten
feather
feet
few
find
fire
fire, lexical suffix
make a fire
fish
fish with hook and line
fish with net
five
(to) fly
flower
foot
forehead
four; eye
freeze
full
G
ghost; dead person
little girl
give

good; pretty
grandfather

xiw; xiwɨw
stigɨɬaŋ
šu?lu?
xwâ̆c
yelexɨ,w
mâčap
-čap
pukwâčap
g̊emqen
qit
taʔyán
cilâč - sîlâč
qâwəq
spaq
cul
sqwâq̓c̓us
mus
čuw
leč
tit ʔátem
sqɨq̓liʔəlu?
kʷiʔ; čaɬč; ʷumłt;
ʷumč ~ ʷuxʷ;
páləč
Łaqʷ
míʔa
grass; weeds

green; yellow

H

hair

hand

he; she

head

hear; listen

heart

heavy

here; near

(to) hide

high; up; above

hit with club

hit in face

hit by throwing something

hold; grasp

horse

hot

house

blue huckleberry

hurry up

husband

I

I

ice

pécčel

qʷíq

leḵʷáč

sqʷələm

təsqə

ʔiʔ; ʔiʔiʔ

'ípxʷaʔn

'Łukʷ

sep'

təqʼxʷus

qʷále

kʷən

stiqíw

xʷələʔ

xaš

skʷiš

xʷátxʷataq

ʔən

ˤənc; ʕən

ˤəw
imperative
intestines
intransitive suffix

J
jump; hurry

K
kill
kitten
knee
know; be able

L
lake
laugh
left
tell legends
lexical suffix
lick
tell lie (females)
tell lie (males)
lie down
lighten
continually lightning
live
body louse
head louse
low; down; below
low; deep
Lower Chehalis; Indian
Lower Chehalis young 
   person; young Indian

M
man; male
young man; boy
old man
little old man
white man
many
meadow
moon
mother
mountain
mouse
mouth

N
name
narrow
neck
net
new
nine
night
no; not

lēp(al)
ləlp
ləwél'mes
ləwél'mesu?
stí?ix\(^W\)
stí?x\(^W\)u?
sx\(^W\)ux\(^W\); súúlman
tsx\(^W\)á?x\(^W\)u?
sx\(^W\)ántem; pástem
qéxəl
máq\(^W\)em
'tehím
kəh
'smá'neč
k\(^W\)elík\(^W\)elí
qenš
syeq
'ka?em
'çõesp
ta'y
meyën
tú?ux\(^W\)
'úli?es
hílu; milt
nominalizer
nose

O
one
other
outside (the house)
owl
little owl
screech owl
oyster

P
Palix River
pay
peas
person
straight pin
play
play (males)
possessive, third singular
pull

Q
Queets

R
rabbit
rain

s-
meqs
paw
tetapaw
pawč
skʷenúčič
skʷenúčiču'o
sx̣eplem
češexʷ
ləpílqs
múxʷon
lipcá
nujitálmeš
'k'ík'íyən̓st
qaːn̓ič
qič
-ens
čən
q'íčxʷ
skìopxʷa
tulə's
<table>
<thead>
<tr>
<th>English</th>
<th>Syllable</th>
<th>Syllable</th>
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<tbody>
<tr>
<td>raven</td>
<td>qʷaqʷ</td>
<td></td>
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<tr>
<td>red</td>
<td>čəscíq - čyeq</td>
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</tr>
<tr>
<td>road; path</td>
<td>ʃúmel</td>
<td></td>
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<tr>
<td>root</td>
<td>teqíxən</td>
<td></td>
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<tr>
<td>rope</td>
<td>ʃe̓melə́e</td>
<td></td>
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<tr>
<td>rotten</td>
<td>núʔəl</td>
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<tr>
<td>rub; paint</td>
<td>ʃələn</td>
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<tr>
<td>run (females)</td>
<td>páʔəeq</td>
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<tr>
<td>run (males)</td>
<td>qəʔeq</td>
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<tr>
<td>S</td>
<td></td>
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</tr>
<tr>
<td>salmonberry</td>
<td>yéʔwəʔo</td>
<td></td>
</tr>
<tr>
<td>salt; salty</td>
<td>qapəs</td>
<td></td>
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<tr>
<td>sand</td>
<td>paqʷt</td>
<td></td>
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<tr>
<td>sapling</td>
<td>cəqáʔəlu</td>
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<tr>
<td>say; speak</td>
<td>ʃəkʷə́s</td>
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<tr>
<td>scratch</td>
<td>saʔq</td>
<td></td>
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<tr>
<td>see</td>
<td>ʔəxən; ʔəxəmel</td>
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<tr>
<td>seven</td>
<td>ʧups</td>
<td></td>
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<tr>
<td>sew</td>
<td>təc(məl)</td>
<td></td>
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<tr>
<td>sharp</td>
<td>leʔaχ</td>
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<tr>
<td>shoot arrow</td>
<td>ʔáyleʔəχ</td>
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<tr>
<td>shoot gun</td>
<td>ʃəčəmel - ʃəčəmel</td>
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<td>short</td>
<td>ʃəčəl</td>
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<tr>
<td>be sick; vomit</td>
<td>súməl</td>
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<tr>
<td>sing</td>
<td>miyíʔə̃hat - miyíʔə̃hat</td>
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<tr>
<td>little sister</td>
<td>pəʔsuʔ</td>
<td></td>
</tr>
<tr>
<td>older sister</td>
<td>yay</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>Y'owl'yu'</td>
<td></td>
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<tr>
<td>----------------------</td>
<td>-------------</td>
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<tr>
<td>adolescent sister</td>
<td>yá?yu'</td>
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<tr>
<td>sit</td>
<td>čim(e)</td>
<td></td>
</tr>
<tr>
<td>skin</td>
<td>šwem</td>
<td></td>
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<tr>
<td>slave</td>
<td>syelqín</td>
<td></td>
</tr>
<tr>
<td>little slave</td>
<td>syelqí?nu'</td>
<td></td>
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<tr>
<td>sleep</td>
<td>mú:sem; ne'x'es</td>
<td></td>
</tr>
<tr>
<td>small</td>
<td>x'wukw</td>
<td></td>
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<tr>
<td>small one</td>
<td>x'wú:k'Wu'</td>
<td></td>
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<tr>
<td>smell</td>
<td>lečqewax</td>
<td></td>
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<tr>
<td>bad-smelling/-tasting</td>
<td>xešásqem</td>
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<tr>
<td>good-smelling/-tasting</td>
<td>'Laq'wásqem</td>
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<tr>
<td>smoke</td>
<td>sq'wux'W</td>
<td></td>
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<tr>
<td>snake</td>
<td>'ulq</td>
<td></td>
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<tr>
<td>snow</td>
<td>'á:něq</td>
<td></td>
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<tr>
<td>speak</td>
<td>'tuq'W</td>
<td></td>
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<tr>
<td>spicy; pepper</td>
<td>'túk'tuk'W</td>
<td></td>
</tr>
<tr>
<td>spit; alive</td>
<td>stëx'sc</td>
<td></td>
</tr>
<tr>
<td>split</td>
<td>paxačan</td>
<td></td>
</tr>
<tr>
<td>split fish</td>
<td>níxasč</td>
<td></td>
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<tr>
<td>split in two</td>
<td>cəl?q</td>
<td></td>
</tr>
<tr>
<td>split wood</td>
<td>paxá?yčep</td>
<td></td>
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<tr>
<td>spoon</td>
<td>'letf'</td>
<td></td>
</tr>
<tr>
<td>teaspoon</td>
<td>'letf'ou'</td>
<td></td>
</tr>
<tr>
<td>soft; suave</td>
<td>ʔap'čos</td>
<td></td>
</tr>
<tr>
<td>son</td>
<td>man</td>
<td></td>
</tr>
<tr>
<td>small son</td>
<td>má?nu'</td>
<td></td>
</tr>
<tr>
<td>squeeze; rinse; dirt</td>
<td>q'wič</td>
<td></td>
</tr>
<tr>
<td>squirrel</td>
<td>sk'wiyúh</td>
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</tr>
</tbody>
</table>
little squirrel
stand up
stand up (plural)
star
stative aspect
steal
straight
suck
sugar
summer
sweet
swell
swim

T
tail
tears
ten
thank you
that
that (non-feminine)
there
they
thick
thin
think
third singular subject
this (feminine)
this (non-feminine)  
three  
throw  
thunder  
tie  
tomorrow  
too (excessively)  
tooth; teeth  
tongue  
oyster tongs  
transitive marker  
tree  
turn around  
two  

U  
uncle  
Upper Chehalis language  

V  
vegetables ("buried")  
very  

W  
walk  
walk around  
wash  
water  

we  
tí'en; tí'enši'  
čə́l  
leq̓helə́xʷ  
hanés  
lémał  
ʔíleš  
siw  
yé̱nes  
tíxʷcel  
čənpuːst  
-ən  
čeqáł  
yacușeqəməh  
sal  
tat  

təwáʔənəxʷeq  

smúʔəlem  
xʷə́l(ən); lat  

yíliʔ  
yílyíliʔ  
čəxʷ  
qu̓ə́l  
ʔəním; -čə́l
weave  pêt'bal
wet  sëx'el
whale  syaléx'
what?  tam
when?  ḍawát - ḍawát?i
where?  (wi)čán
white  česléq'
who?  wat
wide  lēq'(al)
wife  nək'wák'
wind  słex'
wipe  lak'
woman; female  sq'q̓łaməl
old woman  snáʔčəm
little old woman  snáʔcaʔmuʔ
white woman  spaxstanl
wood  sx'əčəp
work; do  ḥēmel
worm  nəpəlməs
write  ḍəhəməl

Y
you  nūʔ; -č̌s
you all  -əláp; -č̌up

(unidentified)  la-
(unidentified)  telápəs
(unidentified)  -təm