LEXICAL PHONOLOGY OF CHILCOTIN

by

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to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

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Date June 30, 1988
This thesis analyses the native Indian language Chilcotin through the use of the lexical phonology model. Data were collected from five speakers varying in age, dialect and sex. Chapter 1 discusses the segmental, tonal and syllabic systems in Chilcotin. Chapter 2 is a discussion of the vowel harmony process, flattening. Chapter 3 is an analysis of morphological rule formation and Chapters 4 through 7 present a discussion of the lexical and post-lexical levels. Chilcotin was found to be composed of three lexical levels and one post-lexical level.
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CHAPTER 1: INTRODUCTION

1.0 Introduction

This thesis presents a lexical phonology analysis of Chilcotin, a language spoken in the southwestern area of British Columbia, Canada. It proposes that the theory of lexical phonology (Kiparsky 1982, 1983), hereafter LP, provides an insightful description of selected complex phonological and morphological processes found in Chilcotin. The present chapter begins the presentation with an introduction to Chilcotin. It provides an overview of the native speakers consulted, and the Chilcotin segmental system, tones, syllable structure, and verbal morphology.

Chapter 2 discusses the phenomenon of flattening, a vowel harmony process (c.f. Cook 1983), and provides a theoretical account for it within LP. Although this chapter deals with a subset of the overall phonology, I have ordered it before the broader phonological discussion since an understanding of flattening is necessary for the latter.

Chapter 3 begins the analysis by giving an overview of LP. This is followed by the main body of the thesis in Chapters 4 through 7. These outline how the rules of Chilcotin phonology operate at each of three levels, and postlexically.
1.1 Speakers Consulted

Chilcotin is an Athapaskan language which is a member of the larger Na-Dene language family. As British Columbia's southernmost Athapaskan language, Chilcotin is surrounded primarily by Salishan languages and is bordered by Lillooet and Shuswap. Its only neighboring Athapaskan language is Carrier.

The data were collected in Vancouver during 1984 and 1985 from five native speakers who participated in varying degrees in a field methods class on Chilcotin. (Here each of the five speakers is assigned a letter A-E.) Additional data were subsequently obtained from two of the speakers (A and B).

The speakers ranged in age from a young man in his teens (C) to a grandfather in his 50's (D). Speakers C, D and E had only recently left the reserve, while speakers A and B had lived away from the reserve for quite some time. Speaker A claimed to be also fluent in Carrier as well as having some knowledge of French and German. He had worked as a translator in Canadian legal courts for monolingual Chilcotins, and also had some previous experience teaching Chilcotin to an English speaker. With the exception of the eldest man (D), all of the speakers had some training at school in reading and writing Chilcotin. In fact, speakers A and C often commented on the phonetic transcription. All of the speakers were fluent in English.

Due to the differences in age, area, and time away from the reserve there is variability among the speakers for many forms.
This is particularly noticeable in the flattening process. There are many instances where speakers do not flatten vowels that fall within the scope of the flattening rules (see Chapter 2 for rule formation). These examples will be marked (FL. IRR.). Table I provides a summary of information about the five speakers consulted.
## Table I. Speaker Information

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Sex</th>
<th>Age</th>
<th>Area</th>
<th>Languages Known</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>M</td>
<td>Late 20's</td>
<td>Anaham</td>
<td>English, Carrier, Chilcotin, some German and French</td>
</tr>
<tr>
<td>B</td>
<td>F</td>
<td>Early 20's</td>
<td>Nemiah Valley</td>
<td>English, Chilcotin</td>
</tr>
<tr>
<td>C</td>
<td>M</td>
<td>Late teens</td>
<td>Nemiah Valley</td>
<td>English, Chilcotin</td>
</tr>
<tr>
<td>D</td>
<td>M</td>
<td>Late 50's</td>
<td>Alexis Creek</td>
<td>English, Chilcotin</td>
</tr>
<tr>
<td>E</td>
<td>F</td>
<td>Early 20's</td>
<td>Nemiah Valley</td>
<td>English, Chilcotin</td>
</tr>
</tbody>
</table>
1.2 **The Chilcotin Segmental System**

In this section, I will discuss the segmental system of Chilcotin (consonants, vowels, and tones), and give a brief overview of the Chilcotin syllable.

1.2.1 **Consonants.** Chilcotin has a rich consonant system, as shown in Table II. The inventory is comprised of stops, fricatives, affricates, nasals, liquids, and glides. The stops and affricates appear in three orders—plain, aspirated, and glottalized, and will be transcribed following traditional Athapaskanist orthographic practices. The plain unaspirated series is represented by the symbol usually reserved for voiced consonants. The aspirated series is represented by those usually reserved for voiceless segments, while the ejectives are transcribed in conformity to the International Phonetic Alphabet. This practice is exemplified below for the dento-alveolar series:

<table>
<thead>
<tr>
<th>Phonetic</th>
<th>Orthographic</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>d</td>
</tr>
<tr>
<td>th</td>
<td>t</td>
</tr>
<tr>
<td>t'</td>
<td>t'</td>
</tr>
</tbody>
</table>

The Chilcotin consonant system exhibits five places of articulation: labial, dento-alveolar, alveopalatal, velar and glottal. Both the dento-alveolar and velar series contain
Table II. Chilcotin consonants. Flat consonants are indicated by a raised ^, and follow their sharp counterparts.

<table>
<thead>
<tr>
<th></th>
<th>Labial</th>
<th>Dento-</th>
<th>Alveo-</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>alveolar</td>
<td>palatal</td>
<td>Unround</td>
<td>Round</td>
</tr>
</tbody>
</table>

**Stops**

<table>
<thead>
<tr>
<th></th>
<th>plain</th>
<th>aspirated</th>
<th>glottalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>plain</td>
<td>b</td>
<td>p</td>
<td>t'</td>
</tr>
<tr>
<td>aspirated</td>
<td>d</td>
<td>t</td>
<td>k'</td>
</tr>
<tr>
<td>glottalized</td>
<td>g,\hat{g}</td>
<td>k'\hat{k}</td>
<td>k'w</td>
</tr>
</tbody>
</table>

**Affricates**

<table>
<thead>
<tr>
<th></th>
<th>plain</th>
<th>aspirated</th>
<th>glottalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>plain</td>
<td>dz,dz,dl</td>
<td>ts,ts,t^4</td>
<td>ts',ts',t^4'</td>
</tr>
<tr>
<td>aspirated</td>
<td>dz</td>
<td>t^s</td>
<td>t^s'</td>
</tr>
<tr>
<td>glottalized</td>
<td>dz,\hat{dz},dl</td>
<td>ts,ts,t^4</td>
<td>ts',ts',t^4'</td>
</tr>
</tbody>
</table>

**Fricatives**

<table>
<thead>
<tr>
<th></th>
<th>voiceless</th>
<th>voiced</th>
</tr>
</thead>
<tbody>
<tr>
<td>voiceless</td>
<td>s,\hat{s}</td>
<td>z,\hat{z}</td>
</tr>
<tr>
<td>voiced</td>
<td>x</td>
<td>x\hat{w}</td>
</tr>
</tbody>
</table>

**Nasals**

|                | m | n |

**Glides**

|                | Y | w |

**Laterals**

|                | 4 | 1 |
further subdivisions determined by their type of release. In the dento-alveolar series, affricates are divided into two groups determined by their type of release—lateral or sibilant:

(1) **Lateral Release** | **Sibilant Release**
---|---
a. ?isdlos 'sleigh' E | c. bidzax 'spittoon' A
b. ťowešan 'snake' E | d. ťai 'head' A

The velar consonants are also subdivided into two groups—rounded and unrounded:

(2) **Rounded** | **Unrounded**
---|---
a. ʼiw̓'ih 'shirt' E | c. gaendzəz 'elbow' A
b. ʼkw̓'i̓k̓'i̓ 'Canada Jay' E | d. kantsai 'basket' E

One of the most salient subdivisions in Table 2 is the flat-sharp distinction found in the dento-alveolar and velar series. In the dento-alveolar series, the distinction is restricted to sibilants and affricates with sibilant release. The flat consonants are characterized by a slightly retracted articulation. Latimer (1978) has found through spectrographic analysis that the flat series exhibits a locus increase of 500 Hz. Some examples in phonetic transcription are:
These differences, however, are difficult even for "a seasoned Athapaskanist to distinguish" (Cook 1983). However slight the phonetic difference may be, I will argue in Chapter 2 that the phonology of Chilcotin definitely manifests a vowel harmony process of flattening triggered by flat consonants.

The velar stops, divided into rounded and unrounded, are further subdivided into sharp and flat, where flat velars are marked phonetically by a heavy fricative offglide and a slightly uvular articulation, as seen in the following data:

<table>
<thead>
<tr>
<th>Sharp</th>
<th>Flat</th>
</tr>
</thead>
<tbody>
<tr>
<td>/s/  sae 'sun' B</td>
<td>/s/  taś 'bed' B</td>
</tr>
<tr>
<td>/z/  diz 'sister' A</td>
<td>/z/  ʐai 'belt' C</td>
</tr>
<tr>
<td>/ts/  di₄tsaen 'blue' E</td>
<td>/ts/  tśa 'beaver' E</td>
</tr>
<tr>
<td>/ts'/  ts'i 'boat'</td>
<td>/ts'/  tś'ay 'plate' A</td>
</tr>
<tr>
<td>/dz/  dzindii 'all day' E</td>
<td>/dʑ/  dʑat 'tobacco' A</td>
</tr>
</tbody>
</table>

The flat velars are all marked by a heavy offglide, and the right hand examples in (4) have a retracted uvular
articulation.

1.2.2 Vowels. The vowel inventory is comprised of six underlying sharp vowels and six allophonic flat vowels (i.e. retracted). The presence of the flat vowels is entirely predictable in that they occur only when a flat consonant is present within the word (as will be discussed in further detail in Chapter 2). The vowel qualities with respect to height and backness are sketched below:

<table>
<thead>
<tr>
<th>Sharp</th>
<th>Flat</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td>u</td>
<td>e</td>
</tr>
<tr>
<td>e</td>
<td>o</td>
</tr>
<tr>
<td>a</td>
<td>i</td>
</tr>
<tr>
<td>ae</td>
<td>a</td>
</tr>
<tr>
<td>e</td>
<td>a</td>
</tr>
</tbody>
</table>

The sharp-flat correspondences are as follows: i ---> e or ai, i and e ---> a, ae ---> a, u ---> o, u ---> o. ae,a,u,o,e, and i are non-central and a,e,u,o, and i are centralized. Cook (1986) labels these latter two groups as full and reduced respectively. Both sharp and flat vowels have nasal vowels as allophones:

(5) a. /in4i/ [i4i] 'one' E

b. /gunzun/ [guzun] 'it is good' A
c. /kongh/ [ko] 'house' E
d. /naen4engo/ [na4ey] 'horse' E
1.2.3 The Syllable. I follow Cook (1986) in assuming there are three core syllable types: CV, CVC, and CV̆C where C is any consonant, V is a full vowel, and ̆V is a reduced vowel. In the examples below, '.' stands for a syllable boundary, and the relevant syllable is underlined.

(6) CV

?in.tsi 'grandfather' E

CVC

tsae 'beaver' E

se.k'i 'cow' E

CVC

k̆r̆h.k̆r̆h 'bluejay' E

yet 'breastbone' A

Complex onsets occur in my data very infrequently. The only example I have is [sdley] 'pants'.

1.2.4 Tone. High ('), low ('), and mid tones (which will be unmarked) are found in Chilcotin, as in [koʃ] 'house' E, [dlɪk] 'squirrel' E, and [yæt] 'breastbone' E.

Mid tones are derivable (as in Roberge 1985) from the (underlying) high and low tones. A phonemic high tone lowers to a mid tone when it occurs to the right of a voiced consonant as shown in the pairs below.
11

(7) a. i. /di/ --> [di] 'horn' E
ii. /k'i/ --> [k'i] 'willow' E

b. i. /zi/ --> [zi] 'mouth' E
ii. /ši/ --> [ši] 'belt' E

A phonemic low tone raises to a mid tone when it occurs after a voiceless consonant.

(8) a. i. /dẹ-paet/ --> [dẹ-paet] 'it is flattened' E
ii. [bẹt] 'mittens' E

b. i. /ʃeŋ/ --> [ʃeŋ] 'song' E
ii. [nəŋ] 'back' E

Of the contour tones, rising tone (mid to high) is found only in questions, and falling tone (mid to low) is found in syllables that contain full vowels, nasal consonants, and glides. I will not be indicating tone in this thesis as its interactions with the segmental phonology is not fully understood. See Roberge (1985) for further analysis.

1.3 **Verbal Morphology**

This thesis deals mainly with the phonology which affects verb stems and their verbal morphology. The minimal Chilcotin
sentence contains one word which is composed of a series of prefixes built up on a verbal stem. A template of these prefixes is as follows (also see chart at the end of the thesis for a summary of the abbreviations used):

post - adv - stem - dur # obj - subj - obv - deriv % deriv - mode

1 2 3 4 5 6 7 8 9 10

conj - pm - clsf - stem

11 12 13 14

(# and % indicate different boundaries between affixes which will be discussed in detail in Chapter 3).

As we can see in the string above, these affixes provide information regarding subject (6,12), object (5,7), and mode and aspect (4,10,11). There are also affixes of an adverbial (2,8,9) and postpositional (1) nature. Some examples of their occurrence are given below. (All of these examples are from speaker A).

(9)

a. ta - ẑài - s - tael 'I kicked'
   deriv mode pm stem

b. naen - dże - ti - l - bin 'they swam away from you'
   post subj deriv clsf stem
c. d₃i - yo - ghe - n - tael 'they kicked it (many times)'
subj obv mode conj stem

d. ho - ghe - n - tsi 'you shot it (many times)'
derv mode pm stem

e. na - gh₃ - h - d - zun 'you (pl) are good again'
adv mode pm clsf stem
Footnotes for Chapter 1

1. Also spelled Athabaskan.

2. Phonologically, the laterals /ɶ/ and /l/ class themselves with the fricatives in regard to the fricative voicing rule whereby voiceless continuants become voiced intervocalically. Here ɶ ---→ l.

3. There is a variant of z, which occurs in syllable final position, that has some l quality to it. This is probably a borrowing of a similar sound in Thompson.
CHAPTER 2: FLATTENING

2.0 Introduction

This chapter deals with the vowel harmony process of flattening. It precedes the general chapter on phonology, as an understanding of the flattening process is necessary to the discussion of the vowel mutation rules found in Chapters 4-7.

Latimer (1978) argues that the traditional term flattening should be replaced by a more phonetically descriptive term. He suggests the name 'retracted tongue root' or RTR. Here I will retain the traditional term as a general name, but will refer to RTR in the more formal description of the rule.

2.1 Flattening

Flattening is a harmony process triggered by the flat consonants \(^1\) (see Table 2). As a first approximation, we can say that sharp vowels are retracted to their flat allophones when a flat consonant is present in the word. (Flattening does not extend beyond word boundaries). The allophonic vowel variations are repeated below as follows:
Before discussing the details of flattening, I would like to discuss how examples will be presented in the chapter. Words will be shown in their phonetic forms, followed by their underlying representations between slant lines. In phonetic forms, all flat consonants and flattened vowels will be underlined. In the underlying forms, however, I will only underline those vowels and consonants which are involved in the aspect of flattening being discussed.

In each of the examples below, (i) gives an example of a flattened vowel and (ii) an example with the corresponding non-flat allophone. The flat vowel occurs in each case because of the presence of a flat consonantal trigger within the word. The type of trigger and consequent spread of harmony will be discussed shortly.
Some Examples of Flattening

a. i --> ai

i. [sai-tain] /ti - tin/ 'he is sleeping' C
   perf stem
   10 14

ii. [ta-gha-ti4] /tae-ghε-ti4/ 'we are going to sleep' B
    derv inc stem
    8 10 14

b. i --> e

i. [ts'i de-na2] /ts'i di-ne2/ 'the boat is long' A
   'boat' derv stem
   9 14

ii. [ts'i di-n-di] /ts'i di-n-di/ 'the boat is short' A
   'boat' derv conj stem
   9 11 14

c. e --> a

i. [na4ey sa-s-ta4] /na4ey si-s-tε4/ 'I kicked the horse' B
   'horse' perf pm stem
   10 12 14

ii. [ta-ghi-n-tε4] /tae-ghi-n-tε4/ 'he kicked into a group' B
    derv inc conj stem
    8 10 11 14

d. ae --> a

i. [ta-2a-h-tal] /te-ši-εh-tael/ 'you (pl) kicked' A
   derv perf pm stem
   9 10 12 14

ii. [ta-2ai-n-tael] /te-ši-in-tael/ 'you kicked' A
    derv perf pm stem
    9 10 12 14
e.  \( u \rightarrow o \)

i.  \([go-\hat{\text{e}}-t'in] \ /gu-\hat{s}i-id-t'in/ 'we want to sing' B  \\
\text{derv perf pm stem}  \\
\text{8} \quad \text{10} \quad \text{12} \quad \text{14}  \\

ii.  \([\hat{\text{a}}en \ \text{gu-lin}] \ /\hat{\text{a}}en \ \text{gu-lin}/ 'there is a lot' D  \\
'a lot' derv stem  \\
\text{8} \quad \text{14}  \\

f.  \( u \rightarrow \partial \)

i.  \([-dl\ddot{o}x] \ /dlux/ 'to laugh' \)  \\
\text{stem}  \\
\text{14}  \\

2.2  \textbf{Velar Harmony}  \\
Vowels may be flattened by the following velar consonants:  \\
\(/\hat{g}, \hat{\ddot{w}}, \hat{k}, \hat{kw}, \hat{k}', x, xw, gh/\). The extent to which the flattening harmony spreads is dependent upon the type of trigger involved. An alveolar trigger, subject to certain restrictions to be discussed below, can affect vowels up to two syllables away. In \([na-ta-ka\hat{s}] 'it is slowly turning' B, all three vowels have succumbed to the flattening process. In (2)a.i, b.i, c.i, and d.i above, all of the vowels in the word have also flattened. The velar trigger, however, can affect only vowels in adjacent syllables. This can be seen by contrasting (2)b.i and a.ii above. In example (2)b.i, the dento-alveo \(/\hat{\ddot{z}}/\) has flattened two vowels to its left: \(/tsi\ \text{di-n\ddot{e}\hat{\ddot{z}}}/ \rightarrow [ts'\ddot{\ddot{i}} \ \text{de-} \ \text{n\ddot{a}\hat{\ddot{z}}}] 'boat is long'. However, the velar trigger, \([gh],\) in (2)a.ii can only flatten the immediately
adjacent vowels—[a] to the left and [ε] to the right, resulting in [ta-gha-ti4]. We can see the process at work also in example (2)c. The velar trigger in (2)c.ii has flattened only the adjacent vowel [æe], leaving the stem vowel as sharp [ε], whereas in (2)c.i this vowel has flattened to [a] because the trigger was from the dento-alveolar series.

Other examples of the limited spread from velars are given below. In each case only vowels in immediately adjacent nuclei have flattened. In f.and g. the flattening process has spread leftward over the neutral consonant [4] and the [-RTR] [s].

(3)a. [канэ] /канэ/ 'spoon' E
b. [ho-ghe-n-ksi] /hu-ghi-n-ksi/ 'he shot it repeatedly' B
derv ser conj stem
8 10 11 14
c. [hu-ta-ghe-tsaax] /hu-tae-ghe-tsaex/ 'we are going at it'B
derv derv inc stem
8 8 10 14
d. [xwэ - ?intsi] /xwэ-?intsi/ 'our grandfather' E
poss stem
e. [не-s-жеv] /не-s-жi/ 'I walked' E
perf pm stem
10 12 14
f. [betJей дэ-ne-4-Kat] /дэ-ni-l-Kat/ 'he broke the chair in half' A
chair derv perf clsf stem
8 10 13 14
g. [betʃet da-na-s-ᵽat] /de-ni-s-ᵽ-ᵽat/ 'I broke the chair in half' A

chair deriv perf pm stem
8 10 12 14

h. [mido] /miduŋ/ 'whiteman' E

i. [bilo] /biluŋ/ 'knife' E

j. [i4a] /i4aŋŋ/ 'one' E

k. [diya] /diyaŋŋ/ 'man' E

In the last four examples, additional rules have applied to give the correct surface form, a nasalized vowel. See section 7.1 for further discussion.

If we compare the data above to the following data, we can see that it is indeed the distance from the trigger to the potential vowels which prohibits the flattening, rather than the manner of articulation of the velar trigger. The examples below indicate the ability of each type of velar consonant (stop, fricative, and labiovelar) to trigger flattening in adjacent vowels.

The only occasional exception to the harmony process is the vowel [i]. This could be due to the fact that [i] is a front high vowel and in order to articulate it the tongue root has to return to a more neutral position thus stopping the retracting process. In example (4)a.i, the first [i] does not flatten to [e] or [ai] although it is within the domain of velar harmony (see also Latimer 1978 and Cook 1983).
(4) **Stops**

a. i --> ai

i. [ni-kain] /ni-\kain/ 'we paddled' E

   perf stem
   10  14

ii. [?aakai] /e\ski/ 'child' E

iii. [sa-kai] /seki/ 'my foot' C

iv. [ya\ekik] /yaekik/ 'ball' B

b. ae --> a, u--> o

i. [sakot] /sae\kut/ 'shadow' A

ii. [ya\kox] /yaekux/ 'river' A

(5) **Fricatives**

a. ae --> a

i. [nae-ta-gha-gho\es] /nae-tae-gh\es-s-gho\es/

   obj der inc pm stem
   5   8  10   14

   'I am going to tickle you' A

b. e --> a

i. [gak] /ge\x/ 'rabbit' A

(6) **Labiovelars**

a. e --> a
Vowel Flattening

\[ V \rightarrow [+\text{RTR}] \% C \]

Vowels become flat when they are in a nucleus that is on either side, and immediately adjacent to, flat (or [+RTR]) velar consonants.
2.3 Alveolar Harmony

As has been noted elsewhere (Latimer 1978, Cook 1983, Krauss 1975), alveolar-triggered harmony consists of two distinct processes. One process flattens to the right and is subject to several blocking restrictions. The other process flattens in a leftward direction and is unbounded in its spread. I will first discuss the rightward process, as it is more limited.

2.3.1 Rightward Alveolar Harmony. Rightward harmony does not spread beyond the vowel [i] (although it does itself flatten), and does not extend beyond sharp consonants. (Sharp designates those consonants that have a flat counterpart: k, g, k', k'w, g'w, k'w', s, z, ts, dz, ts'). The set of data below illustrates the inability of rightward harmony to flatten beyond the vowel [i]. In the examples in 7, the [i] has flattened to [ai] or [e], but has blocked any further spread of the harmony.

(7) a. [go-ze-t'in] /gu-śi-id-t'in/ 'we want' A
derv perf stem
   8 10 14

b. [śai-daeh] /śi-daeh/ 'I am sitting' C
   perf stem
   10 14

c. [śai-deh] /śi-deh/ 'I am living (with him)' B
   perf stem
   10 14
d. [na-ṭai-dɔit] /nae-ši-dɔit/ 'I crawled' B  
dur perf stem  
4 10 14

e. [ta-ṭai-n-tael] /te-ši-in-tael/ 'you kicked' A  
derv perf pm stem  
9 10 12 14

f. [na-še-bin] /nae-ši-bin/ 'I swam' A  
dur perf stem  
4 10 14

(I cannot account for the missing person markers in f and d).

All of the above data have the perfective marker /ši/ as the blocking element. I have no other examples of a flat /š/ or a sharp /i/ in a preverbal affix because of the limited type of affixes available. However, the incorporated stem (position 3) is a possible source of an additional /š/.

The following data illustrate the blocking effect of sharp consonants in rightward harmony. (Here both the flat consonant which causes flattening and the sharp one which blocks it are underlined in the underlying forms).

(8) a. [ba-ṭak'ì] /be-šek'ì/ 'his cow' E  
poss stem

b. [ʔa-ta-xa-s-ts'ì] /ʔe-te-ši-s-ts'ì/ 'I shot'  
obj derv perf pm stem  
5 9 10 12 14

c. [nae-gwa-da-ʔ-k'aen] /nae-gwe-di-ʔ-k'aen/  
adv obj derv perf stem  
2 5 8 10 14

In the data above, [k'] and [s] have blocked the harmony, so that the vowels occurring to the right of the sharp
consonants remain sharp. In (8)b and c, a rule for i-lowering (p.80) has first applied, lowering the /i/ to [ε] before the consonant [s]. Since the /i/ has lowered, it does not block the flattening process. (The details of i-Lowering will be discussed in section 4.2.1).

Another situation where /i/ does not block flattening is when it is deleted before flattening occurs. The following examples illustrate this, where /i/ deletes due to the existence of the following /ɛ/ (see section 4.2.1 for further discussion). The flattening process in these examples is allowed to spread to the end of the word. This shows that it is indeed the presence of this vowel that blocks rightward spread of flattening. (The /i/s which delete are underlined in the underlying forms).

(9) a. [go-t’a-h-t’en] /gu-si-ɛh-t’in/ 'you (pl.) want' A 
   derv perf pm stem
   8  10 12 14

   b. [ta-t’a-h-tal] /te-si-ɛh-tael/ 'you (pl.) kicked' A 
   derv perf pm stem
   8  10 12 14

Due to the nature of rightward harmony, a segmental rule similar to Velar Flattening in section 2.2 would be very encumbered. It would have to state that the harmony proceeded unless either a [-RTR] consonant or the vowel [i] was present, in which case the vowel would become [+RTR].
2.3.2 **Leftward Alveolar Harmony.** Leftward harmony is unbounded, capable of spreading beyond both the vowel [i] and sharp consonants. The following data illustrate that leftward harmony spreads as far as possible within the word—even up to three syllables away from the trigger.

(10) a. [da-tə-~a-s-ts'ẽt] /dae-tẽ-~i-s-ts'ẽt/ 'I fell down'
   derv derv perf pm stem  
   8 8 10 12 14

   (this [dae] affix could be either derv or adv)

b. NP [da-na-1-da̰z] /de-nae-l-dḛz/ 'ground meat' A
   derv derv clsf stem  
   8 8 13 14

c. i. [na-na-tə-~ai-tin] /nae-nae-tẽ-~i-tin/  
   adv dur derv perf stem  
   2 4 8 10 14

   'I started dreaming again' B

   ii. [nae-na-tə-~ai-tin] (same as above, spoken slowly)

   (note: first [nae] did not flatten)

   Leftward harmony is **not** blocked by the vowel /i/, as the following data illustrate, where the flattening process has spread beyond /i/. (The underlying flattener and the /i/ to its left are underlined).

(11) a. [sə-deya̰z] /sẽ-diye̐z/ 'my male' A
   poss stem  

b. [na-de-na̰z] /nae-di-ne̐z/ 'it is long again' A
   adv derv stem  
   2 8 14
c. [na-de-s-k'ae'n] /nae-di-s-k'ae/ 'it is burning again' E
adv derv perf stem 2 8 10 14

d. [ya-te-z-l-tjos] /ye-ti-z-l-tjus/ 'he is holding it'
obv derv perf clsf stem (from Cook 1983) 7 8 10 13 14

e. [na-ne-s-tl'on] /nae-ni-s-tl'un/ 'fence'

Nor is leftward harmony blocked by sharp consonants, as shown in (11).

(11) f. [na-ta-k'as] /nae-tae-k'es/ 'it is slowly turning' B
dur derv stem 4 8 14

g. [tanantilk'a2] /taenentilk'e2/ 'water starts to get cold'

In both these cases, the harmony has spread over a sharp [k']. Examples (11)a and (10)c.i show that the harmony may spread as far as the adverbial affix (position 2) and the durative affix (position 4). As seen in (10)c.ii, however, the process tends to weaken as it moves further and further away from the trigger, leaving the leftmost vowel as sharp when the word is spoken slowly.

2.3.3 Summary. Alveolar harmony has two distinct directional processes. When the harmony spreads to the right, it is blocked by sharp consonants and the vowel /i/, although /i/ will itself flatten to [aɪ] or [e]. Leftward alveolar harmony, on the other hand, is not blocked by either sharp
consonants or the vowel /i/. /i/, however, is somewhat resistant to retraction.

2.4 Theoretical Aspects of Harmony

Having described the bidirectional harmony process in Chilcotin, I now turn to the theoretical mechanisms available to describe alveolar harmony.

Kiparsky (1985) suggests that all harmony systems can and should be handled by the autosegmental framework first developed by Goldsmith (1976). Kiparsky claims that 'the autosegmental theory is correct and requires no metrical supplementation for harmony processes' (1985: 68). He wants to restrict the use of the metrical framework, as developed in Hayes (1980), to stress rules, because the hierarchical metrical trees imply 'the capacity for global large-scale transmissions of phonological information' (1985: 2). Kiparsky further claims that implementing autosegmental harmony rules within the lexical phonology model, which we have independent motivation for in the grammar of English, entirely does away with the necessity of using both metrical and autosegmental frameworks to analyse what had been earlier described as dominant versus directional harmony (Kaye 1982; Halle and Vergnaud 1981).

By using autosegmental rules within the lexical phonology model, we no longer need the powerful mechanism of metrical structure to describe harmony systems. Such a decision will
simplify the phonological component of many languages. As LP (lexical phonology) is independently motivated for Chilcotin (as will be shown in Chapter 4), I follow Kiparsky in implementing an autosegmental approach to vowel harmony within the LP model.

2.4.1 Rightward Alveolar Harmony. As noted earlier, the vowel /i/ and all sharp consonants block the spread of rightward harmony. I assume that they are linked to a [-RTR] (retracted tongue root) autosegment. The trigger of the harmony process is a flat consonant which has attached to it a [+RTR] autosegment as shown below.\(^6\)

\[(12) a. \quad [+RTR][-RTR] \quad /\quad [na-\hat{e}-bin] /nae-\hat{s}-i-bin/ 'I swam' A
\]

\[b. \quad [+RTR] [-RTR] \quad | \quad | \\
[go-\hat{z}-\hat{e}h-t\&n] /gu-\hat{z}-\hat{e}h-tin/ 'you (pl.) want it' A
\]

\[c. \quad [+RTR] [-RTR] \quad | \quad | \\
[?a-ta-\hat{\&}a-s-ts'i] /?e-t\&e-\hat{\&}s-ts'i/ 'I shot' B
\]

(I assume that the Obligatory Contour Principle will collapse the three [-RTR] features on the [s], [ts] and [i] into one.)

The feature [+RTR] is allowed to spread freely under the restriction of Goldsmith's Well Formedness Condition (WFC), which states that there may not be any crossing autosegmental
lines. This produces the phonetic forms shown in (12). The spread of [+RTR] is blocked by the [-RTR] autosegments. If the [+RTR] were to spread beyond the linked [-RTR], crossing lines would be created, thus violating Goldsmith's WFC. I assume that in the case of /i/ → [ai] the [+RTR] feature attaches to the prelinked [-RTR] of /i/ and creates a branching RTR feature node as shown below.  

\[
\begin{array}{c}
+RTR \\
-\text{RTR} \\
i
\end{array}
\]

The [+RTR] is realized as the onglide [a] in [ai]. I assume there is an optional low level phonetic rule that will change [ai] to [e].

The following rule can thus be written for rightward harmony.

**Rightward Harmony**

Spread [+RTR] to the right.

For those vowels that remain unlinked, I assume a default rule that inserts the feature [-RTR] as in (13).
Vowels (except /i/) are unmarked for the feature [-RTR] on the segmental tier and will receive this feature only through the default rule.

2.4.2 Leftward Alveolar Harmony. Leftward alveolar harmony, as shown earlier, is not blocked by the [-RTR] autosegments of [i] or sharp consonants. To prevent crossing autosegmental lines, I assume the following context sensitive delinking rule (as suggested by Dr. Patricia Shaw):

[-RTR] Delinking

This accounts for the fact that the light diphthong [ai] (which has a [-RTR] feature attached) is never found to the left of a flat trigger.
Leftward Harmony

Spread [+RTR] on the vowel tier

Here are some examples of how this rule operates:

(14)

\[-RTR\] [+RTR] \\
\ \ / \\
 a. /nae-tae-k'ês/ --> nae-tae-k'æs --> [na-ta-k'æs]

'it is slowly turning' B

\[-RTR\] [+RTR] \\
\ / \\
 b. /taenêntilk'ês/ --> taenêntilk'æs --> [tanêntelk'æs]

'water starts to get cold' (Latimer 1978: 9)

\[-RTR\][+RTR] \\
| | \\
 c. /nae-di-nez/ --> nae-di-nez/ --> [na-de-naž]

'it is long again' A

2.4.3 Velar Harmony. Velar Harmony can also be written as an autosegmental rule, with the restriction that it spreads only to immediately adjacent vowels.

Velar Harmony

1) Spread [+RTR] bidirectionally to a maximum of one nucleus in either direction.
Some examples are given in (15).

(15)

\[
\begin{array}{ccc}
\{[+RTR]\} & \{[+RTR]\} \\
\mid & & \mid \\
\text{a. } /\text{kænizh}/ & \rightarrow & \text{kænizh} & \rightarrow & [\text{kâñzh}] & \text{'}spoon' \ E \\
\{[+RTR]\} & \{[+RTR]\} \\
\mid & & \mid \\
\text{b. } /\text{de-ni-}4-\text{kêt}/ & \rightarrow & \text{de-ni-}4-\text{kêt} & \rightarrow & [\text{de-ne-kêt}] \\
\mid & & \mid \\
\text{c. } /\text{se-sae}k\text{ut}/ & \rightarrow & \text{se-sae}k\text{ut} & \rightarrow & [\text{se-sa}k\text{ot}] & \text{'}my shadow' \ A \\
\end{array}
\]

'he broke it in half' \ A

2.5 **Summary**

The flattening phenomena are summarized below.

**General Description**

**Velar Harmony** - a flat velar consonant flattens immediately adjacent vowels.

**Alveolar Harmony**

**Rightward** - a flat alveolar consonant flattens vowels to the right but is blocked by \{i\} and sharp consonants.

**Leftward** - a flat alveolar consonant flattens vowels to the left. This process is unbounded.
Autosegmental Representation

1) All flat consonants are linked to a [+RTR] autosegment.

2) The vowel [i] and all sharp consonants are linked to a [-RTR] autosegment.

3) There is a context sensitive delinking rule whereby the sequence [-RTR] [+RTR] is not allowed and the [-RTR] delinks.

Rule Formation

Velar Harmony Rule

Spread [+RTR] bidirectionally to a maximum of one nucleus in either direction.

[RTR] Delinking

\[
\begin{array}{cc}
x & x \\
\hline
[-RTR] & [+RTR]
\end{array}
\]

Alveolar Harmony Rule (subject to the WFC)

Spread [+RTR].
Domain of RTR Harmony

None of these rules apply across word boundaries as shown below.

(16) a. [se tsi _wat] 'my knee' A

b. [ba d3a= tl'u1] 'his fish hook' A

c. [ni tsi _raz] 'deer skin' A

Therefore all three harmony rules are assigned to level 1 (Strong Domain Hypothesis) and do not shut off until the post-lexical level is reached.

2.6 Comparison to Cook (1987)

The main arguments in this section were written before the publication of Cook's 1987 article. In this section I will discuss the differences between my data and that in Cook (1987).

There are two main differences. The first has already been mentioned. In my data both [ai] and [e] occur to the right of a trigger, as shown below for each speaker (there was insufficient data for speaker C).
(17) a i. \([k'w\text{as \_se\text{-}lin}] \) 'I have a cold' A
   cold perf stem
   10 14

   ii. \([s\text{e\text{-}zai}] \) 'my mouth' A
   poss mouth

b i. \([yo\text{-}ghe\text{-}n\text{-}tsi}] \) 'he shot it (many times)' B
   obv perf conj stem
   7 10 11 14

   ii. \([\text{sa\text{-}daeh}] \) 'I am sitting' B
   perf stem
   10 14

  c i. \([ghe\text{-}li}] \) 'it was' D
   perf stem
   10 14

   ii. \([nae\text{-}\text{sa}i\text{-}tin}] \) 'I dreamt' D (FL. IRR.)
   dur perf stem
   4 10 14
The second main difference is Cook's account of sibilant harmony whereby "non-neutral sibilants assimilate to the rightmost non-neutral sibilant" (pg. 56). This serves to block leftward harmony. Cook thus analyses the [+RTR] as a floating feature. I do not have any data that exemplify this, however.

There are many basic similarities in the analyses. Cook has 2 main processes; alveolar and velar. He uses [+RTR] as the spreading segment and [-RTR] as the blocking feature. Neutral consonants are attached to neither. Velar harmony is much more limited in scope and can flatten only neighboring vowels.
Footnotes for Chapter 2

1. This type of vowel harmony, where the trigger is a consonant, has also been documented for the African language Tigre by Vergnaud (1985).

2. Latimer (1978: 20) states that only [ai] occurs to the right of the flat consonant (and [e] occurs only when it is to the left). My data do not suggest this I have examples from four of my speakers where both [ai] and [e] occur to the right of the trigger.

3. This example is from Cook (1976: 21).

4. I have left the affixes undefined since I am unsure of their meaning. This is a verb string that functions as a noun (a zero derived noun).

5. This example is from Latimer (1978). He does not provide an explanation of the morphemes present in this string. Latimer states that in leftward harmony [i] sometimes does not flatten, although it does not block the further spread of flattening.

6. Having both features present on the autosegmental tier is not entirely unprecedented. Kiparsky uses both + and - nasal for nasal harmony in Guarani, and both + and - for Akan tongue
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root harmony (Kiparsky 1983).

7. I am indebted to Dr. Patricia Shaw for this suggestion.

8. Ideally there should only be one flattening rule since it is the same feature being spread in each case. It has been suggested to me by Dr. Shaw that the in velar harmony process both the velar trigger and the RTR vowels may be linked to a dorsal node on their feature trees (dorsal refers to the tongue position) which would prohibit further spread. [+RTR] would not be able to spread beyond the dorsal node.
CHAPTER 3: LEXICAL PHONOLOGY

3.0 Introduction

As noted in section 1.3 of Chapter 1, the minimum sentence in Chilcotin consists of a selection of elements from the following verbal string:

post adv stem dur # obj subj obv deriv % deriv mode conj pm clsf stem

The affixation of these various morphemes results in a number of complex phonological changes. Analyses of these will be presented in Chapters 4 through 7, using Lexical Phonology (LP) as the theoretical model. This chapter gives an overview of the general characteristics of the model and its appropriateness for the analysis of Chilcotin.

3.1 The Lexical Phonology Model

LP inter-orders morphology and phonology within the lexicon. The lexicon consists of ordered levels (or strata) and each morphological affixation process takes place at a particular level.

"The rules of phonology interact with the morphology in that the phonology rules are assigned specific morphological strata as their domain and a given
phonological rule applies only at the stratum that is
assigned to it." (Halle & Mohanan 1985)

These phonological rules are termed 'lexical', since they apply
in the lexicon after each application of a morphological rule,
and are opposed to 'post-lexical' rules, which apply after the
syntax.¹

Besides differing in their domain of application, lexical
and post-lexical rules may also have different properties
(Kiparsky 1985). For one, lexical rules are usually boundary
sensitive and may have idiosyncratic exceptions, whereas
post-lexical rules apply 'across the board' wherever their
environment is met. Post-lexical rules may also be optional,
as in the case of leftward harmony in Chilcotin. Another
difference is that lexical rules usually produce strings that
are structure preserving in the sense that they do not
introduce nondistinctive features such as nasalization in
English. The introduction of nondistinctive features is the
domain of post-lexical rules.

Another distinction between lexical and post-lexical rules
is in their mode of application. Lexical rules must obey the
Strict Cycle Condition or SCC (Kiparsky 1985), while
post-lexical rules do not. The SCC states that lexical
phonological rules can only apply to derived environments. A
derived environment is defined as a string to which either a
morphological or phonological rule of the same level has
applied. Thus a level 2 rule could not apply to a form that has had neither a level 2 morphological or phonological rule already apply. Structure building rules, e.g. those which add prosodic structure or fill in previously unspecified feature values, are considered by Kiparsky (1985) to be an exception to the SCC. As we will see in 5.2.2, however, at least one structure building rule in Chilcotin must obey the SCC.

Kiparsky (1985: 1) claims that the distinction between lexical and post-lexical rules is important due to its implications for learnability. He states that "...the learner does not have to fix the domain of these rules by checking their ordering or other properties". If a rule is boundary sensitive and structure preserving, then it must be lexical. On the other hand, if a rule applies whenever its environment is met and is not structure preserving, then it will necessarily be post-lexical.

There are two opposing hypotheses regarding rule ordering within the lexicon. Kiparsky (1984:5) states that:

"...the grammar may stipulate merely where a rule ceases to apply...All rules are potentially applicable at the first level of the lexicon, and apply there provided that the principles of grammar permit it; at lower levels of the lexicon and in the post lexical level phonology rules may be 'turned off' but no new ones added (The Strong Domain Hypothesis)."
An alternative hypothesis for the assignment of rule domain is given in Halle & Mohanan (1985). They claim that the post-lexical is the most unmarked level and rules are assigned to the latest level possible rather than the earliest.

Both Kiparsky (1984) and Halle & Mohanan (1985) claim that their model is best suited to a theory of learnability. In Kiparsky's model, it is easier to learn where a rule shuts off, while in Halle and Mohanan's, it is easier to learn where a rule starts. I agree with Hargus (1985) that neither claim has any empirical evidence to support it. I have, therefore, chosen Kiparsky's model because it explains the historical process of the lexicalization of rules (Kiparsky 1982). However, as we will see in Chapter 4, the Strong Domain Hypothesis must be weakened slightly to allow some new rules to be added at non-initial levels of the lexicon.

If LP is the correct model to use to describe the interplay of Chilcotin morphology and phonology, we should expect to find data that would indicate the existence of lexical and post-lexical levels. Such data have been found in earlier generative studies of Athapaskan, as I will now discuss.

3.2 Evidence for LP in Athapaskan

Earlier generative studies noted a common phonological division among affixes built up on the Athapaskan stem. There
seemed to be a clustering effect at work, dividing the string of affixes into two phonological domains. For descriptive purposes I have represented this word internal division with a boundary symbol of the type developed by Chomsky & Halle (1968).

The first published reference to boundary-related phenomena is found in Li (1946:409) where it is reported for Chipewyan that...

"...there are two classes of prefixes, the conjunctive and the disjunctive. The conjunctive prefixes occur immediately before the stem and after the pronominal objective prefixes... There are also frequent contractions of these prefixes when they come together. The disjunctive prefixes occur before the pronominal objects and are less connected with the stem...[they] do not as a rule contract with the conjunctive prefixes."

Similar observations are made in Kari's study (Kari 1975) of the disjunct boundary in Navaho and Tanaina. He states (p. 331) that this "word internal boundary...plays a significant role in the phonologies", despite their being geographically distant from each other. This disjunct boundary creates a division in the prefixes as shown below. Here the # marks the disjunct boundary where the prefixes to its left are disjunct, and those to its right are conjunct.
Morphological Structure of Navaho and Tanaina

| 1: adverbial | 2: iterative | 3: plural | 4: direct object | 5: deictic |
| 6: aspect | 7: mode | 8: perfective | 9: subject | 10: classifier | 11: stem |

Kari (p.333) adds the following comments about this boundary:

"It seems clear that the secondary [or disjunct] prefixes are probably late incorporations of independent prefixes as data from the archaic Eyak language show that Eyak verbs begin with the direct object position and what are disjunct prefixes in Athapaskan are preverbal elements in Eyak."

This secondary or disjunct boundary of Athapaskan plays a large role in my analysis of Chilcotin as well. It conforms to the division between the durative and direct object affixes in Chilcotin. It is also a major division in the phonology of Sekani (Hargus 1985). Instead of having to encode this distinction with an ad hoc boundary, LP captures this clustering effect by proposing morphological strata which phonological rules are assigned to. The fact that certain phonological rules only apply to some affixes (or morphemes) and not to others is expected in a theory which groups affixes into separate classes or strata. In this case, the primary or conjunct affixes are assigned to one level and the secondary or
disjunct ones to another.

While Kari discusses two types of affixes, other research on Athapaskan languages has suggested even more distinctions. Li (1946) has evidence for three types of affixes in Chipewyan—disjunct, pronominal subject and object, and conjunct. Hargus (1985) has reported the existence of four levels in Sekani. As will be shown below, there is evidence for three morphological levels in Chilcotin. Thus although the theoretical framework is different the current analysis will be similar in content to that described by Li for Chipewyan.

Before presenting my analysis of the phonological and morphological levels of Chilcotin, I will begin with a discussion of the nature of morphological rules. This is because the theoretical assumptions which I am making are different from those usually used in LP^3.

3.3 Morphological Rule Formation

Athapaskan languages present three ordering problems for any theory of morphology. First, the verbal affixes occur in a strict order. A theory of affixation will have to ensure that this order is preserved. Second, the direction in which the affix string is built is problematic. If it is done right to left, it violates Anderson's (1982) claim that the affixation of derivation should precede that of inflection. This is because Chilcotin has inflectional affixes in positions 5 (object), 6 (subject), 7 (obviative), and 12 (person marker).
(Inflection is defined here as affixes which specify either person or number of the subject or object.) Third, some of the affixes in positions 2 (adverb), 8 and 9 (both derivative) form discontinuous stems with the stem of position 14. Some examples are [tae...daen] 'to drink', [yae...tek] 'to speak', [ye...zun] 'to think', and [dae...le4] 'to float'. In these cases both the stem and the derivative affix are needed to convey the full meaning of the verb. The theory of affixation will need to allow for the intervention of other affixes between these discontinuous elements.

The method of affixation which I present below provides a solution to all three of the above problems. I will first present arguments in favor of a right to left affixation process, and then turn to the details of the theory that ensure affix order and allow the presence of discontinuous stems.

As Rice (1985) has pointed out, if derivational affixes are attached before inflectional ones, it is necessary to prefix the derivational morphology onto the stem, and then infix all of the inflectional morphology. This is objectionable on two counts. First, it is counterintuitive, since the linear order would not reflect the true ordering of the affixation process. Second, it is impossible to formulate phonologically. As she comments (p. 159), "Once the entire derivational string is present, there is no phonological context on which infixation (of inflection) can be defined". One would have to resort to an infixation process defined by
morphological position. Rice argues that this is equally unacceptable:

"It might be possible to formulate a complex infixation rule making crucial reference to various morphological boundary types but if Anderson's theory were to permit resorting to such devices, his claim that all inflectional affixes must be outside derivational affixes would be rendered virtually unfalsifiable". (Rice 1985:160)

Furthermore, in LP an infixation process defined by either morphological position or boundary type is impossible, since referring to morphological position is not allowed and boundaries have been done away with in favor of levels (although reference to morphological bracketing is in restricted conditions available to phonological rules). I follow Rice in assuming that inflectional affixation in Chilcotin must be allowed to precede derivational affixation, creating a uniform right to left process.

The theory of affixation which I adopt follows proposals made for English by Aronoff (1974), Lieber (1980), and Selkirk (1976). Affixation takes places through the insertion of morphemes into branching trees. In this system, affixes have subcategorization frames which ensure the co-occurrence of discontinuous morphemes while generating the correct surface order in a uniform right to left process.
Lieber (1980) proposes a system of morphological affixation that maintains a single context-free rule which generates unlabelled binary branching tree structures. Stems are first inserted into the tree structure, followed by affixes, based upon their subcategorization frames. For example, the English adjective 'happy' is first inserted into the tree, since it is a stem, e.g.

\[
\begin{array}{c}
/ \\
\text{happy} \\
/ \\
\end{array}
\]

Then the suffix '-ness' is inserted, subject to its subcategorization frame which states that it can only attach to adjectives:

\[
\begin{array}{c}
/ \\
\text{happy} \\
/ \\
\text{ness}
\end{array}
\]

Each affix is listed in the lexicon with a subcategorization frame which states its co-occurrence restrictions. For English, for example, the suffixes '-ness' and '-ize' would have the following subcategorization frames: [adj ___]_N and [N___]_V. Thus '-ness' attaches to the right of adjectives and creates nouns such as 'happiness', and '-ize' attaches to the right of nouns to create verbs such as 'standardize'.

I can now show how this affixation process operates in Chilcotin. Due to the many types of affixes found in the verb
string I propose that the relevant features for subcategorization are those of the affix categories, i.e. +stem, +classifier, +conjunct, +mode, +derivative, etc. rather than simply Noun and Verb. This is not very radical if we look at what Chomsky (1965:199) originally said about the use of N and V. "It is quite possible that the categories noun, verb, adjective are the reflection of a deeper feature structure, each being a combination of features of a more abstract sort". Chomsky leaves the exact nature of the features an open question and continues to use the abbreviations N, V, and A, since they do function as discrete classes in English.

The use of features other than N, V, and A is not entirely unprecedented. Aronoff (1974) uses abstract morphological features such as 'latinate', 'Greek', 'Romance', and 'native' for English to ensure that the affixes such as '-ity' and '-hood' attach to the correct roots, e.g. 'ity' is [+latinate] and '-hood' is [+native]. He states (p.19):

"The most important thing to be noted about a feature like latinate is that it is abstract...there is good evidence that the feature latinate is a property of morphemes. Further evidence...of the abstract and arbitrary nature of the feature latinate is that monomorphemic (and truly latinate) words tend to move into the native classification for purposes of affixation as in priesthood and statehood."
Selkirk (1982) mentions the possibility of languages in which it might be necessary to specify such features as gender, plural and case in order to derive correct affix order. The features I propose for Chilcotin are used in the subcategorization frames of affixes to ensure that they attach in the correct order to the correct stems. Crucially, I assume that morphemes attach when only the features in their subcategorization frames are present and no other features are present.

To exemplify how correct affix order is obtained, I will use the mode affix /ghe/ as an example. The mode affixes (position 10) all have the features ([+conj]), [+pm], and [+clsf] in their subcategorization frames to ensure that they are added only after the classifier (position 11), person marker (position 12), and conjunct affixes (position 13), and no others, have been attached. (The conjunct affix is optional and is added only if the verb is marked for third person).

I assume that the features of each morpheme will percolate up the binary branching tree under the following Feature Percolation Conventions, as defined by Lieber (1980):

**Feature Percolation Conventions**

I: All features of a stem morpheme, i.e. a morpheme lacking a subcategorization frame, label the first non-branching node dominating it;
II: All features of an affix percolate to the first branching node;

III: If a branching node fails to obtain any features via II, features from the next lowest node percolate up to it, i.e. if it fails to obtain any features that are not mutually exclusive. ⁴

We can see how these operate by looking at the labelling of the tree for 'happiness'. By Convention I, the feature [+A] of the stem 'happy' percolates to the first non-branching node dominating it:

```
   /\  
  / \ 
[+A] / \ 
|   |   
'happy' '-ness'
```

By Convention II, the feature [+N] of the affix '-ness' percolates to the first branching node:

```
[+N] 
/ \ 
[+A] / \ 
|   |   
'happy' '-ness'
```

Convention III is ruled out since the branching node is already specified for a category.

The operation of Convention III can be shown by giving Lieber's example from Latin of 'dix-era-mus'. /dix/ is
[-present], /éra/ [+perfect], and /mus/ [+first person]. These features percolate up to the uppermost branching node via Convention III, since this node has failed to receive any specifications for these features via Convention II:

\[
\begin{array}{c}
[+V] \\
[+\text{present}] \\
[+\text{perfect}] \\
[+1 \text{ person}] \\
\hline
'\text{dix}' \\
'\text{era}' '\text{mus}'
\end{array}
\]

To exemplify these conventions for Chilcotin affixation, I will use the example /tae-s-daen/ 'I'm drinking'. /daen/, with its features [+stem, +drink], is freely inserted into a binary tree. By Convention I, the features [+drink], [+stem] percolate up:

\[
\begin{array}{c}
[\text{+drink}] \\
[\text{+stem}] \\
'\text{drink}' \\
[\text{+drink}] \\
[\text{+stem}]
\end{array}
\]

This produces a node which the classifier can attach to. The classifier is only subcategorized for stems and does not require any other features to be present.
At this stage, the feature [+clsf] will percolate up to the first branching node via Convention II:

Now, by Convention III, the feature [+drink] is also able to percolate up to the branching node, since this node is not specified for that feature:
Person markers can now attach, since they require only the feature [+clsf] in their subcategorization frames:

\[
\begin{array}{c}
\text{'s'} \quad [+\text{clsf}] \\
[+\text{pm}] \quad [+\text{drink}] \\
\end{array}
\]

\[
\begin{array}{c}
\text{'l'} \quad [+\text{clsf}] \\
\end{array}
\]

Next, the person marker feature percolates to the branching node via Convention II. The features [+clsf] and [+drink] may also percolate up via Convention III:
The phonologically null imperfect marker can now attach, as its subcategorization frame requires only the presence of a person marker (where Convention III has also applied):
The tree at this point will now enter level 2, whereupon all internal morphological tree structures are erased, leaving:

\[
\begin{array}{c}
[+imp] \\
[+pm] \\
[+clsf] \\
[+drink] \\
/ \\
/ [+pm] \\
\$ [+clsf] \\
[+imp] [+drink] \\
/ \\
/ \\
/'s' [+clsf] \\
[+pm] [+drink] \\
/ \\
/ \\
/'l' [+clsf] \\
/ \\
[+drink] \\
[+stem] \\
/'drink' \\
[+drink] \\
[+stem] \\
[\$ - s - l - daen]
\end{array}
\]

Now the level 2 affix /tae/, which has the subcategorization frame [___ +drink], is allowed to attach, giving the tree:
A phonological rule later deletes /l/, resulting in [tae-s-daen].

3.4 Summary

We have seen above how the problematic Chilcotin word formation process can be simplified by using a few relatively straightforward mechanisms that have been independently motivated for English affixation (Kipasky 1982). This has been done by making the following general assumptions: (1) affixes have subcategorization frames; (2) the relevant features for Chilcotin consist of several affix categories of the type [clsf], [mode], [person], etc., and of abstract semantic features, e.g. [drink], [talk], etc. (c.f. Aronoff 1974, Lieber 1980); (3) word formation is in the form of binary branching trees into which affixes are inserted, subject to their subcategorization frames; and (4) there are three Feature Percolation Conventions. Discontinuous morphemes are no longer a problem, nor is a contiguous right to left affixation process.
Footnotes for Chapter 3

1. I assume that after the last lexical level the morphemes enter the syntax where lexical insertion takes place. See Chomsky (1981) for details.

2. Eyak is a sister language to the Athapaskan languages which, according to Krauss, retains many elements of an Eyak-Athapaskan language ancestor.


4. There is a fourth convention that deals with compounds which I have not included here as it is not relevant.
CHAPTER 4: THE LEXICAL PHONOLOGY OF CHILCOTIN: LEVEL 1

As mentioned in the previous chapter, my analysis of Chilcotin proposes three levels to the morphology. Each level will be presented in a separate chapter, with the current chapter dealing with Level 1. Within each of these chapters, I will first discuss the morphological classes which are associated with it, followed by a description of the rules which apply.

4.1 Morphology

4.1.1 Stems (Position 14). The Chilcotin verb stems vary in accordance with the mode and aspect of the entire string. Both the stem vowel and the final consonant may change, as can be seen in the following examples:¹

(1) a. [tae-zul] 'he's going to start being good' A
derv stem
   9  14

b. [na-ghə-d-zun] 'he is good again' A
derv mode cls stem
   9  10 13 14

c. [na-ghə-d-zun] 'he often becomes good' A
dur mode cls stem
   4  10 13 14
d. [nae-tae-d-zul] 'he is going to be good again' A
   adv derv cls stem
   2  8  13  14

e. [la hi-zul] 'he is not good (for the job)' A
   neg derv stem
   9  14

f. [la hi-zuh] 'he's not good (healthy)' A
   neg derv stem
   9  14

g. [ghe-n-zu] 'he was once good' A
   mode conj stem
   10  11  14

4.1.2 Classifiers (Position 13). There are 4 Chilcotin classifiers: /d, 1, 4, /2. When productive, /4/ generally marks transitivity as seen in the data below:

(2) a. i. [da-z-§-k'an] 'it is burning' E
   derv perf cls stem
   9  10  13  14

   ii. [di-4-k'aen] 'I burned it' E
      derv cls stem
      9  13  14

b. i. [gwa-da-gha-s-§-mal] 'I rolled' E
   obj derv perf pm cls stem
   5  8  10  12  13  14
ii. [gwe-day-4-mal] 'I rolled it' E

   obj  derv  cls  stem
   5  9  13  14

c i. [tae-#-sax] 'he is going to spit' A

   derv  cls  stem
   9  13  14

ii. [bε-dzax  bi-tae-4-sax] 'he is going to spit his

   his gum  adv  derv  clsf  stem
   gum' A

In some paradigms, the classifier is not needed to mark
transitivity. In the following transitive verbs, the
classifier is /#/.

(3) a. [ho-ghe-n-#-tsi] 'you shot it (many times)' B

   derv  perf  pm  cls  stem
   8  10  12  13  14

b. [ye-#-daen] 'he is drinking it' C

   obv  cls  stem
   7  13  14

c. 'Mary' [sai-n-#-ta4] 'you kicked Mary' B

   perf  pm  cls  stem
   10  12  13  14

In the majority of cases, the classifiers have become
idiosyncratic, and it is simplest to list the stems to which
they attach in their subcategorization frames.

4.1.3 Person Markers (Position 12). These affixes mark
the person and number of the subject. The inventory is listed below with examples following:

<table>
<thead>
<tr>
<th>Person</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>s</td>
<td>id</td>
</tr>
<tr>
<td>Second</td>
<td>in</td>
<td>eh</td>
</tr>
<tr>
<td>Third</td>
<td>$</td>
<td>$ (marked by $d_3E$ in position 6)</td>
</tr>
</tbody>
</table>

(4) a. [hɛ-s-dʒɛn] 'I sing' E
derv pm stem
9 12 14

b i. [h-in-dʒɛn] 'you sing' E
derv pm stem
The vowel here must be /i/ rather than /ɛ/ (which would not raise to [i] before [n]) due to the following data where /ɛ/ does indeed occur before [n].

ii. [nɛ-nɛz] 'it is long' A
derv stem
9 14

iii. [te-na-dʒi-ya-gha-l-tʃut] 'they caught it again' A
adv dur subj obv perf clsf stem
2 4 6 7 10 13 14

iv. [gwe-ni-nk'æez] 'water is cold' (Cook 1987)
v. [nae-se-nae-ghe-ne-l-tfens] 'you are hitting me' (Cook 1987)

c. [he-*d3en] 'he sings' E
derv pm stem
d. [h-i-d3en] 'we sing' E
derv pm stem
e i. [h-eh-d3en] 'you (pl.) sing' E
derv pm stem

This affix must be vowel initial due to the following examples.
e ii. [gax de-ni-4-te4] 'he shot the rabbit' B
    rabbit deriv perf clsf stem
    8 10 13 14
iii. [gax de-n-e-4—te4] 'you (pl.) shot the rabbit' B
    rabbit deriv perf pm clsf stem
    8 10 12 13 14

The perfective affix is /ni/ as shown in example ii. In example
iii, it is the vowel [e] that surfaces. This can only be due to
an /e/-initial person marker. The /h/ of the person marker
would have coalesced with the following /4/ classifier (see
4.2.3) before the /ni/ perfective was added. The /h/ would
thus not be available to lower the i of /ni/ to [e]. Therefore
this person marker must be /eh/. (I also assume that this affix
is vowel initial based on historical evidence. Krauss (1964)
has reconstructed this affix as *ax for Na-Dene.)
4.1.4 Conjunct (Position 11). Chilcotin has one conjunct affix /n/. It occurs only in the third person forms of strings that contain either the /ghi/ seriative or /ni/ perfective affixes. The function of the conjunct in Chilcotin is not clear. In Sekani the conjunct affix marks conjugation classes of modes. (Hargus 1985).

(5) /ghi/ Seriative
   a. [yo-ghe-n-tael] 'he kicked it' (seriat.) A
      obv perf conj stem
      7 10 11 14

   b. [yo-ghe-n-tsi] 'he shot it' (seriat.) B
      obv perf conj stem
      7 10 11 14

   c. [d3i-yo-ghe-n-tael] 'they kicked it' (seriat.) B
      subj obv perf conj stem
      6 7 10 11 14

   d. [sit na-ghi-n-tsun] 'he kissed me' B (FL. IRR.)
      pron dur perf conj stem
      4 10 11 14

(6) /ni/ Perfective
   a. [d3i d3e-ni-n-dil] 'they arrived here' A
      'here' subj perf conj stem
      6 10 11 14
b. 'Mary' [ni-n-di] 'Mary was short' A

   noun perf conj stem
   10 11 14

c. [na4ey xwa-ta-ni-n-tael]

   noun obj deriv perf conj stem
   5 9 10 11 14

   'the horse was kicking into us' B

As can be seen in the data below, conjunct [n] occurs only in the third person.

(7) a. [yo-ghe-n-tael] 'he kicked it' A

   obv perf conj stem
   7 10 11 14

b. [ho-gha-s-tael] 'I kicked it' A

   deriv perf pm stem
   8 10 12 14

c. [ho-gha-h-tael] 'you (pl.) kicked it' A

   deriv perf pm stem
   8 10 12 14

d. [ho-ghe-tael] 'we kicked it' A

   deriv perf stem
   8 10 14

4.1.5 Mode (Position 10). These affixes; perfective, imperfective, optative, inceptive, and seriative—mark the modal mood of the verb string as described in the sections
below.

**Perfective: /ni, sû, ghê/.** This affix indicates a completed action. The semantic distinctions among these three affixes are not clear from my data. Stems with which each has been found are listed below.

<table>
<thead>
<tr>
<th>/sû/</th>
<th>/ni/</th>
<th>/ghê/</th>
</tr>
</thead>
<tbody>
<tr>
<td>'shake' NP</td>
<td>'arrive'</td>
<td>'sing'</td>
</tr>
<tr>
<td>'turn' NP</td>
<td>'crawl'</td>
<td>'smell' NP</td>
</tr>
<tr>
<td>'spit' NP</td>
<td>'break in half'</td>
<td>'scratch' NP</td>
</tr>
<tr>
<td>'shatter' NP</td>
<td>'shoot'</td>
<td>'cry'</td>
</tr>
<tr>
<td>'glance at' NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'push' NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'poke' NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'swim'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'want (to sing)''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'cut' NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'dream'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'fall down'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'sit'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'get bloody' (â€)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'sleep' (â€)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'shoot' unspecified NP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I have classified the /šɛ/ affix in 'get bloody' and 'sleep' as a variation of the perfective /ši/ affix rather than as a conjunct affix due to its semantic function— a marker of completed action. /ši/ perfective also has /ži/ as a variant which cannot always be accounted for by intervocalic voicing of the /š/.

**Imperfective:** /š/. Phonologically null, this affix indicates actions that are incomplete. Both examples are from speaker A.

(8) a. *[nə4-yaɛ-ʃ-s-tə4]* 'I am speaking with you'

post derv imp pm stem
1  8  10 12 14

b. *[sak'i ʔɛ-ʁɛ-tɛ-ʃ-tsih]*

noun  obj subj derv imp stem
5  6  9  10 14

'they are shooting into a group of cows'

**Optative** /ɡwɛ/. Both phonologically and semantically, this is a very interesting affix. Phonologically it affects certain vowels to the right, rounding and lowering them. (This will be further discussed on pages 96-7). Semantically, this mode translates as a desire or wish of limited sorts as in the following:
(9) a. [gh\textsuperscript{wo-d3\textsmash{en}}] 'let's sing' B  
\hspace{1cm} opt stem  
\hspace{1cm} 10 14

b. [wo-n-d3\textsmash{en}] '(they asked) you to sing' B  
\hspace{1cm} opt pm stem  
\hspace{1cm} 10 12 14

c. [gh\textsuperscript{a-su}] 'I'm thinking about being good' A  
\hspace{1cm} opt stem  
\hspace{1cm} 10 14

d. [wa-s-t\textsuperscript{ja}h] 'I'm thinking about being big' A  
\hspace{1cm} opt pm stem  
\hspace{1cm} 10 12 14

(in b. and d. the velar [gh] was so weakly articulated that it is not represented in the phonetic transcription)

**Inceptive:** /\textit{tae}...ghe/. /\textit{tae}/ in position 8 plus this affix, /ghe/, indicate the inceptive--an event or action that will soon start.

In the first person singular and the third person singular and plural, the perfective /ghe/ often does not occur. This is shown below in the (i) examples.

(10) a. i. [tae-s-\textsuperscript{7il}] 'I'm going to look at it' A  
\hspace{1cm} deriv pm stem  
\hspace{1cm} 8 12 14
ii. [ta-gha-l-ʔ1l] 'we are going to look at it' A
derv inc cls stem
   8  10  13  14

b. i. [d3e-tae-dil] 'they are going to drink' A
   subj derv stem
   6  8  14
ii. [ta-gha-dil] 'you (pl.) are going to drink' C
derv inc stem
   8  10  14

c. i. [tae-tsat] 'he is going to swing' E
derv stem
   8  14
ii. [ta-gha-n-tsat] 'you are going to swing' E
derv inc pm stem
   8  10  12  14

The affixation of /ghe/ is therefore optional for third person singular and plural and the first person singular. (See section 7.2 for [gh] contraction in fast speech).

**Seriative** /ghi/. As mentioned earlier, the seriative mode denotes usually a singular action that has been repeated many times, as in the following:

(11) a. i. [yo-ghe-n-tael] 'he kicked it many times' A
   obv ser conj stem
   7  10  11  14
ii. [ya-\textsuperscript{\textdagger}ta\texttextsuperscript{\textdagger}] 'he kicked it once' A

  obv perf stem
  7  10  14

b. i. [x\textsuperscript{\textdagger}a-d\textalpha -ghi-n-tael] 'they kicked us many times' A (FL. IRR.)

  obj subj ser conj stem
  5  6  10  13  14

ii. [dx\textsuperscript{\textdagger}e-ta\textsuperscript{\textdagger}ta\texttextsuperscript{\textdagger}] 'they kicked once' A

  subj derv perf stem
  6  9  10  14

c. i. [so-ghi-n-tal] 'he kicked me many times' A (FL. IRR.)

  obj ser conj stem
  7  10  11  14

ii. [sa-\textsuperscript{\textdagger}ta\texttextsuperscript{\textdagger}] 'he kicked me once' A

  obj perf stem
  5  10  14

d. i. [ho-ghe-n-tsi] 'you shot it many times' A

  derv ser conj stem
  9  10  11  14

ii. 'Mary' [hu-ni-n-\textit{tsax}] 'you shoot Mary' A

  noun derv perf conj stem
  8  10  11  14

Of phonological interest is the vowel to the left of the seriative affix. In every case, it is the [+RTR] mid back round vowel [o], often accompanied by a [w] glide. This phenomenon will be further discussed in the section on level 2 phonology.
4.1.6 **Derivative** (Position 9). These affixes are generally quite idiosyncratic and many must simply have their subcategorization features listed in the lexicon. At best, I can only state semantic or paradigmatic tendencies among these affixes. The affixes are listed below with examples of each and a semantic explanation when possible.

/te/. This affix is found in verb strings that have an understood goal.

(12) a. \[\text{[\underline{ta} - \underline{z} - t'as]}\] 'he cut it' A
derv perf stem
9 10 14

b. \[\text{[d3e-te-ta4]}\] 'they are kicking' B
subj derv stem
6 9 14

c. \[\text{[?a-ta-za-si]}\] 'I shot' A
obj der perf stem
5 9 10 14

d. \[\text{[ta-ze-4-kat]}\] 'he broke' A
derv perf cls stem
9 10 13 14
e. NP [bi-te-4-zax] 'he usually spits NP' A
   
   adv deriv class stem
   2  9  13  14

f. [da-da-ta-za-4-qin] 'you (pl.) glanced at it' A
   
   deriv deriv deriv perf class stem
   8  8  9  10  13  14

g. [bi-n-ta-za-4-qey] 'you (pl.) vomited' A
   
   post adv deriv perf class stem
   1  2  9  10  13  14

h. [tu ta-4a-len] 'water is flowing' A
   
   noun deriv perf stem
   9  10  14

i. [da-te-4a-d-ts'at] 'I fell down' E
   
   deriv deriv perf class stem
   8  9  10  13  14

j. [naen-ta-4a-s-bin] 'I started to swim away from you' A
   
   post deriv perf pm stem
   1  9  10  12  14

**Idiosyncratic Derivatives.** /ne/ and /di/ are idiosyncratically linked to a stem. /ne/ occurs with 'to think' as shown below.

(13) a. [ne-s-at] 'I am thinking' A
   
   deriv pm stem
   9  12  14
b. [n-i-zət] 'you are thinking' A
derv pm stem
c. [n-e-zət] 'he is thinking' A
derv stem
d. [n-id-zət] 'we are thinking' A
derv pm stem
e. [n-eh-zət] 'you (pl.) are thinking' A
derv pm stem
(In b. and d., /ɛ/ has deleted before the vowel /i/ of the person marker see Vowel Deletion I, section 4.2.1.)

/di/ co-occurs with the stem 'to say'.

(14) a. [hae-de-s-den] 'I said' D
derv derv pm stem
  9  8  12  14
b. [hae-di-n-deh] 'you said' D
derv derv pm stem
  9  8  12  14
c. [hae-di-deh] 'he said' D
derv derv stem
  9  8  14
d. [hae-di-ðeh] 'we said' D

derv derv stem
9 8 14

e. [hae-deh-h-ðeh] 'you (pl.) said'

derv derv pm stem
9 8 12 14

(In a., /i/ has lowered to [ε] due to the following [s], and in e., the /i/ has deleted before the person marker vowel /ε/, see section 4.2.1 for both rules.)

In conclusion, the derivative affixes of level one are /tε/, which attaches to verbs with a goal, and /nε/ and /di/, which are completely idiosyncratic in their attachment.

4.1.7 Summary of Section

Level 1 contains the following morphological affixes:

<table>
<thead>
<tr>
<th>derv</th>
<th>mode</th>
<th>conj</th>
<th>pm</th>
<th>clsf</th>
<th>stem</th>
</tr>
</thead>
<tbody>
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<td>per</td>
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<tr>
<td>tε</td>
<td>ni</td>
<td>n</td>
<td>s</td>
<td>$</td>
<td></td>
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<td>nε</td>
<td>ẽi</td>
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<td>4</td>
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<tr>
<td>di</td>
<td>ghɛ</td>
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<td>imp-</td>
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<td>id</td>
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<tr>
<td>opt-</td>
<td>ghɛ</td>
<td></td>
<td>$</td>
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<td></td>
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<tr>
<td>inc-</td>
<td>tae.</td>
<td></td>
<td>$</td>
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<tr>
<td>ser-</td>
<td>ghi</td>
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</tr>
</tbody>
</table>
4.2 **Level 1 Phonology**

This section is divided into 3 main subsections: (1) rules that create a level 1 distinction, i.e. their environment is met at levels 1, 2, and/or 3, but they apply only to level 1 affixes; (2) rules that apply freely to affixes of levels 1 and 2, but that "shut-off" after level 2; and (3) rules that apply only to level 1 affixes but that do not create a level 1 distinction, i.e. their environment is met only at level 1.

4.2.1 **Rules that Create a Level 1 Distinction**

**Vowel Deletion I.** Three of the person marker affixes are vowel initial--/in/ (second person singular), /id/ (first person plural), and /eh/ (second person plural). When an affix of the form CV is added to a string beginning with one of the VC person markers, a VV sequence is created. This 'CV.VC.stem' sequence is not allowable. There are various options available to syllabify such a sequence; a consonant may be inserted between the two V's (creating 'CV.CVC. stem'), one of the vowels could change into a glide or one of the vowels may delete (creating 'CVC.stem'). Chilcotin uses the last option of vowel deletion. This creates the level 1-2 distinction at level 1 that the leftmost vowel deletes (at level 2, the rightmost vowel deletes). This is illustrated in the data below for the level 1 affixes /tape/ 'derivative', and /sì/
'perfective'.

(15) a. [t-in-tε4] /tε-in-tε4/ 'you are kicking' A
    deriv pm stem
    9 12 14

    b. [t-ld-tε4] /tε-id-tε4/ 'we are kicking' A
    deriv pm stem
    9 12 14

    c. [te-te4] /te-te4/ 'he is kicking' A
    deriv stem
    9 14

(16) a. NP [bi-t-i-4-sax] NP /bi-tε-in-4-sax/
    adv deriv pm clsf stem
    2 9 12 13 14
    'you are spitting NP' A

    b. NP [bi-t-i-1-sax] NP /bi-tε-id-4-sax/
    adv deriv pm clsf stem
    2 9 12 13 14
    'we are spitting NP' A

    c. NP [bi-te-4-sax] NP /bi-tε-4-sax/
    adv deriv clsf stem
    2 9 13 14
    'he is spitting NP' A
(17) a. [na-s-əh-bin] /nae-方言-bin/
    dur perf pm stem
    4 10 12 14
    'you (pl.) swam' (A)
    (here the /e/ of the person marker has flattened to [ə])

    b. [na-şen-bin] /nae-方言-s-bin/ 'I swam' A
    dur perf stem
    4 10 14
    (the /i/ of the perfective marker has flattened to [e]; I
cannot account for the missing /s/ person marker).

    c. [na-şen-bin] /nae-方言-in-bin/ 'you swam' A
    dur perf stem
    4 12 14
    (here the /i/ of the /方言/ perfective has flattened to [e]. I
can not account for the missing /n/.)

(18) a. [ş-əh-ɡwat] /方言-方言-方言/ 'you (pl.) poked' A
    perf pm stem
    10 13 14
    (here the /e/ of the /方言/ person marker has flattened to [ə])

    b. [şai-ɡwat] /方言-s-方言/ 'I poked' A
    perf stem
    10 14
    (the /i/ of the perfective marker has flattened to [ai]; I
cannot account for the missing /s/ person marker)
(19) a. [gh-i-l-gWat] /ghe-in-l-gWet/ 'you crawled' B
   perf pm clsf stem
   10 12 13 14

   b. [gh-i-l-gWat] /ghe-id-l-gWet/ 'we crawled' B
   perf pm clsf stem
   10 12 13 14

   c. [gha-l-gWat] /ghe-l-gWet/ 'he crawled' B
   perf clsf stem
   10 13 14

(in a. and b., [i] has failed to flatten. This was common in the speech of speaker B)

To account for these data the following rule can be written:

**Vowel Deletion I**

\[ V \rightarrow \emptyset / \_ \_ \_ \_ V \]

(I assume that these are V slots on the skeletal tier)

**The Domain of Vowel Deletion I.** The following data reveal that Vowel Deletion I must precede RTR Velar and Alveolar Harmony. In (20)a, Vowel Deletion I has applied first, deleting the [i] of the seriative marker (/ghi/), then RTR Velar Harmony applies flattening /ε/ to [ə]. Example (20)b
reveals the underlying form of the seriative affix.

(20) a. [ho-gh-\(\text{\textbar{\textbar}}\)h-tael] 'you (pl.) kicked it (many times)
   derv ser pm stem
   8 10 12 14

b. [yo-ghe-n-tael] 'he kicked it (many times)
   obv ser conj stem
   7 10 11 14
   (the vowel of the seriative affix has flattened to \([e]\) here)

If Velar Harmony had applied first, the following ungrammatical form would be produced:

(21) a. /hu-ghi-\(\text{\textbar{\textbar}}\)h-tael/  RTR Velar Harmony
   ho-ghe-\(\text{\textbar{\textbar}}\)h-tael  Vowel Deletion I
   *[ho-ghe-\(\text{\textbar{\textbar}}\)h-tael]

The same incorrect ordering can be seen in the following sentence:

b. /gax ho-ghi-\(\text{\textbar{\textbar}}\)h-\(\text{\textbar{\textbar}}\)tsi/ 'you (pl.) shoot many rabbits' A
   gax ho-ghe-\(\text{\textbar{\textbar}}\)h-\(\text{\textbar{\textbar}}\)tsi  RTR Velar harmony
   *(gax ho-ghe-\(\text{\textbar{\textbar}}\)h-\(\text{\textbar{\textbar}}\)tsi)  Vowel Deletion I

Vowel Deletion I must also apply before RTR Alveolar Harmony. As shown in the data below, the \([i]\) of the perfective marker /\(\text{\textbar{\textbar}}\)SI/ deletes (via Vowel Deletion I) after being affixed to the \([\varepsilon]\) person marker, leaving \([\text{\textbar{\textbar}}\varepsilon]\) (or \([\hat{\varepsilon}]\varepsilon\) if it is in
inter-vocalic position).

(22) a. /te-si-eh-zi/  'you (pl.) spit'  A  
    te-ž -eh-zi  
    RTR Harmony  
    [ta-ž -ah-zi]  

b. /te-ši-eh-žet/  'you (pl.) broke NP'  
    te-ž -eh-žet  
    RTR Harmony  
    [ta-ž -ah-žet]  

c. /ši-eh-bin/  'you (pl.) swam'  
    š -eh-bin  
    RTR Harmony  
    [š -ah-bin]  

(All examples are from speaker A)

Thus vowel Deletion I must apply before both Velar and Alveolar Harmony.

**Level Domain of Vowel Deletion I.** Vowel Deletion I does not apply at levels 2 or 3. In examples (23) and (24), it is the rightmost vowel that deletes rather than the leftmost.
(23) **Level 2 Affixes**

a. /dae-eh-dil/ --> [dae-h-dil] 'you (pl.) arrived' A
   
   deriv pm stem
   8 12 14

b. /hu-id-tsax/ --> [hu-tsax] 'we shoot NP' B
   
   deriv pm stem
   8 12 14

c. /ni-eh-4-?aeh/ --> [ni-4-?aeh] 'you (pl.) look at it' A
   
   deriv pm clsf stem
   8 12 13 14

(24) **Level 3 Affixes**

a. /nae-in-d3it/ --> [nae-d3it] 'you are crawling around'

   adv pm stem
   2 12 14

(I cannot account for the missing [n].)

b. /nae-id-l-d3it/ --> [nae-l-d3it] 'we are crawling around'

   adv pm clsf stem
   2 12 13 14

c. /nae-eh-l-d3it/ --> [nae-4-d3it] 'you (pl.) are crawling around'

   adv pm clsf stem
   2 12 13 14

(all examples are from speaker B)

In every case, [ae] has remained and the person marker vowel has deleted.

i-Lowering. Another rule that provides evidence for level
is i-Lowering, where /i/ lowers to [ɛ] before [s] or [z].
This can be seen in the following data. All the (ii) examples in (25) reveal the underlying form of the affix that contains the /i/.

(25) a. i. [ne-s-ɛh] /ni-s-yɛh/ 'I arrived here' A
   perf pm stem
   10 12 14
ii. [ni-ɛh] /ni-yɛh/ 'he arrived here' A
   perf stem
   10 14

(this [ni] is the perfective marker as in [ni-4-tɛt] 'he shot a rabbit' A and [hu-nae-ni-tsin] 'you kissed him' B

b. i. [nae-bi-tɛ-2i-4-tɛt] /nae-bi-ti-s-4-tɛt/
   adv adv deriv pm clsf stem
   1 1 8 12 13 14
   'I pushed you away' B
ii. [dae-bi-yu-ti-4-tɛt] /dae-bi-yɛ-hu-ti-4-tɛt/
   adv adv obv deriv clsf stem
   1 1 7 8 13 14
   'he pushed him over' B

c. i. [nae-ne-s-dʒit] /nae-ni-s-dʒit/ 'I crawled across' B
   adv perf pm stem
   2 10 12 14
ii. [nae-ni-dʒit] /nae-ni-dʒit/ 'he crawled across' B
   adv perf stem
   2 10 14
d. i. [neg-s-\text{kat}] /ni-s-l-\text{ket}/ 'I broke NP' A

perf pm clsf stem

(the [1] classifier has deleted; see Continuant Deletion below)

ii. [ni-l-k\text{at}] /ni-l-k\text{et}/ 'he broke NP' A

perf clsf stem

10 13 14

To account for these data the following rule can be written:

\textit{i-Lowering}

\[
\begin{array}{c}
\text{V} \\
[+ \text{high}] \\
[- \text{back}]
\end{array} \quad \rightarrow \quad \begin{array}{c}
\text{V} \\
[-\text{high}]
\end{array} \quad / \quad \{s\} \quad \{z\}
\]

\textbf{Domain of i-Lowering.} i-Lowering must be ordered before Velar Harmony. As shown below in (26), the seriative affix /ghi/ surfaces as [\text{ghə}]. First, i-Lowering applies, creating [\text{ghɛ}], then Velar Harmony flattens [\text{ghɛ}] to [\text{ghə}].

(26) a. /hu-ghi-s-tael/ 'I kicked it (many times)'

\begin{align*}
\text{hu-ghɛ-s-tael} & \quad \text{i-Lowering} \\
\text{[ho-ghə-s-tael]} & \quad \text{Velar Harmony}
\end{align*}

derv pm stem

8 10 12 14
b. /hu-ghi-s-tsi/ 'I shot it (many times)

  i-Lowering
  hu-ghə-s-tsi  Velar Harmony
  [ho-ghə-s-tsi]

derv ser pm stem
8  10 12 14

(both examples are from speaker A)

i-Lowering and Alveolar Harmony. i-Lowering must also apply before Alveolar Harmony. In the examples below the perfective marker /ˈsi/ has become [ɬˈei] due to the following person marker /s/. The /ɛ/ has then retracted to [a] due to Alveolar Harmony resulting in [ɬə] or [ɬa]. Alveolar Harmony ordered before i-Lowering would produce * [ɬə - (stem)] or *'[ɬəi - (stem)]).

(27) a. [na-ːa-s-bin] 'I swam' A

dur perf pm stem
4  10 12 14

b. [ʔa-ta-ʔa-s-i] 'I shot' A

obj derv perf pm stem
5  9  10 12 14

c. [na-ʔa-s-dət] 'I crawled across' B

adv perf pm stem
2  10 12 14
d. [ta-\^a-s-t\^at] 'I fell down' E
derv perf pm stem
9 10 12 14

e. [ta-\^a-s-k\^at] 'I broke NP' A
derv perf pm stem
9 10 12 14

f. [\^a-ta-\^a-s-tael] 'I kicked NP'
obj derv perf pm stem
5 9 10 12 14

**Level Domain of i-Lowering.** i-Lowering does not apply at level 2. When the /i/ of a level 2 affix occurs to the left of an [s] or [z], it does not lower to [e] as shown in the examples below.

(28) a. [d\^ai-zuh] 'they are not good (healthy)' A
subj stem
6 14

b. [d\^ai-zu] 'they are not good (for the job)' A
subj stem
6 14

c. [ti-z\^ah] 'he is gone' A
derv stem
8 14
d. [ni-s-ʔaeh] 'I look at it' A

derv pm stem
8  10  14

e. [ghe-zu] 'he was once good' A

derv stem
8  14

f. [may ghe-zun] 'berries are good' A

'berry' derv stem
8  14

g. [na-ne-š-tlon] 'fence'

adv derv perf ?
2  8  10  14

i- Lowering also does not apply at level 3. In example (29), the [i] of the level 3 adverb /bi/ has not lowered to [ɛ] although there is an [ʃ] to the immediate right.

(29) [nae-bi-ʃi-4-tsat] 'I pushed you around' B9 (FL. IRR.)

adv adv perf clsf stem
2  2  10  13  14

4.2.2 Rules That Apply at Levels 1 and 2

Having established the existence of level 1, I will now turn to other rules that apply to level 1 affixes, but are not restricted to level 1. That is, they also apply at level 2.
Fricative Voicing. The following data illustrate the phenomenon of fricative voicing, whereby fricatives become voiced in intervocalic position. In the examples below it is the /s/ of the perfective marker /si/ (as in [nae-šai-tin] 'I dreamt' B and [del ša-leyn] 'it got bloody' E) which becomes voiced (at levels 1 and 2).

(30) a. [g a-dae-žai-ta4] 'I kicked it' B

   obj deriv perf stem
   5  8  10  14

b. [tu ta-ža-len] 'water is flowing' A

   noun deriv perf stem
   9  10  14

c. [ta-žai-4-žat] 'he broke NP' A

   deriv perf clsf stem
   9  10  13  14

d. [ta-ži-4-tsat] 'he pushed NP' E

   deriv perf clsf stem
   9  10  13  14

e. [ʔa-ta-ža-tsi] 'I shot' A

   obj deriv perf stem
   5  9  10  14

These data can be accounted for by the following rule.
Fricative Voicing\textsuperscript{10}

\[ [+\text{vce}] \quad [+\text{vce}] \]

\[ \quad \downarrow \quad \downarrow \]

\[ V \quad C \quad V \]

\[ [+\text{cont}] \]

\textbf{Domain of Fricative Voicing.} This rule also applies at level 2, as can be seen in the following example where the affix that contributes to the environment of the rule is a level 2 affix.

(31) \[ \text{næ-₁[²ai-t₄]} \] 'I kicked you' B

obj perf stem

\begin{align*}
5 & \quad 10 & \quad 14 \\
\end{align*}

At level 3, however, inter-vocalic fricatives remain voiceless.

(32) a. \[ \text{næ-₂[²e-s-d₃i]} \] 'I crawled' B (FL. IRR.)

adv perf pm stem

\begin{align*}
2 & \quad 10 & \quad 12 & \quad 14 \\
\end{align*}

b. \[ \text{næ-₂[²ai-tin]} \] 'I dreamt' C (FL. IRR.)

dur perf stem

\begin{align*}
4 & \quad 10 & \quad 14 \\
\end{align*}
c. [nae-yi-b-ı₂{sai-4-tsat}] 'I pushed him around' B
   (FL. IRR.)

   adv adv adv perf clsf stem
   2   2   2   10  12  14

This rule also does not apply post-lexically to underived items or across word boundaries.

(33) a. [ʔe⁴i] 'confluence' A
b. [t⁴owešan] 'snake' C
c. [i⁴i] 'one' E
d. [qwuš qaen] 'a lot of fish' D
   'fish' 'a lot'

As shown above, Fricative Voicing applies at levels 1 and 2.1. I follow Kiparsky's Strong Domain Hypothesis (1984) and assign it to both levels.

4.2.3 Rules That Only Apply at Level 1

Three other rules that apply to level 1 affixes, but do not provide evidence for a level distinction, are D-effect (a common phenomenon in Athapaskan), Continuant Coalescence, and Continuant Deletion. These three rules provide different strategies for getting rid of consonant clusters in the verb string. Continuant Coalescence and D-effect are actually rather similar in that they collapse two adjacent consonants
into one, whereas in Continuant Deletion a consonant deletes rather than coalesces. These rules will be discussed in the following order: D-effect, Continuant Coalescence, and Continuant Deletion.

**D-effect.** D-effect, as it has been traditionally referred to, involves the [d] classifier (or the /d/ of the first person plural /id/) and the stem initial consonants as described below\(^\text{12}\) (see Howren 1971, Krauss 1969 for further details).

\[(34)\]  
d + f \rightarrow d\ddot{s} 
d + z \rightarrow dz 
d + g \rightarrow t' 
d + 4 \rightarrow i \text{ (a flapped [l])} 
d + gh \rightarrow g\text{\(^\text{13}\)}

Some examples are as follows:

\[(35)\]  
d + f \rightarrow d\ddot{s} 
   a. [n\ddot{e}-s-d\ddot{s}e\ddot{n}] /n\ddot{e}-s-d-f\ddot{e}n/ 'I sang' E  
       perf pm clsf stem

   b. [s\ddot{e}-f\ddot{e}n] 'my song' E  
       poss stem

(All modal variations of 'sing' have the [d] classifier and are thus [d\ddot{s}] initial. I assume 'sing' is derived from 'song'.)

(36) \( d + z \rightarrow dz \)

a. \[ na-ne-n-id-\hat{z}at \] /na-ni-ni-id-\hat{z}et/ 'we are thinking' A

\[ \begin{array}{c}
dur \? \\
4 \ 9 \ 10 \ 14
\end{array} \]

derv pm stem

b. \[ na-ne-n\hat{z}at \] /nae-ni-ni-\hat{z}et/ 'he is thinking' A

\[ \begin{array}{c}
dur \? \\
4 \ 9 \ 14
\end{array} \]

derv stem

(37) \( d + ? \rightarrow t' \)

a. \[ k'aen za d3i-dae-t'aez \] /k'aen za d3i-dae-d-?aez/

'just now place' subj derv pm stem

\[ \begin{array}{c}
6 \ 8 \ 12 \ 14
\end{array} \]

'we (2) just arrived (somewhere)' A

b. \[ k'aen za d3i-dae-\hat{h}-?aez \] /k'aen za d3i-dae-\hat{h}-?aez/

'just now place' subj derv pm stem

\[ \begin{array}{c}
7 \ 8 \ 10 \ 14
\end{array} \]

'you (2) just arrived (somewhere)' A

(38) \( d + 4 \rightarrow \tilde{y} \)

a. i. \[ ta-\tilde{z}e-\tilde{y}-\hat{kat} \] /ti-\tilde{z}i-id-4-\hat{ket}/ 'we broke it' A

\[ \begin{array}{c}
derv perf pm clsf stem
\end{array} \]

\[ \begin{array}{c}
9 \ 10 \ 12 \ 13 \ 14
\end{array} \]

derv perf pm clsf stem

ii. \[ ta-\tilde{z}e-\hat{kat} \] /ti-\tilde{z}i-4-\hat{ket}/ 'he broke it' A

\[ \begin{array}{c}
derv perf clsf stem
\end{array} \]

\[ \begin{array}{c}
9 \ 10 \ 13 \ 14
\end{array} \]

derv perf clsf stem

(/ti/ lowers to \[ te \] then flattens to \[ a \]).
To account for the behavior of this classifier I assume, following Wright (1984) and Speas (1984), that it is floating (i.e. it is not attached to its own skeletal point) and will link up to the skeletal slot of the preceding stem consonant. In examples 34, 35, and 36 this will create an affricate or ejective, but in the case of [l] < /d-l/ and [g] < /d-gh/ the [-cont] feature of [d] takes precedence over the [+cont] of the stem consonant, as the sequence /d-gh/ cannot be syllabified into an affricate (although [d1] is an acceptable affricate in Chilcotin the combination /d-1/ results in [1].)  

D-effect

\[
\text{[-cont]} \quad \text{[+cont]} \quad \text{[+vce]} \quad \text{C} \quad \rightarrow \quad \text{[-cont]} \quad \text{[+cont]} \quad \text{[+vce]} \quad \text{C}
\]

**Domain of D-effect.** This rule applies exclusively to level 1 affixes, as this is the only place at which the environment of the rule is met. D-effect is thus assigned to level 1.
Continuant Coalescence. Whenever [h] and [l] are affixed adjacent to one another, the strategy used to eliminate this continuant cluster is coalescence, as in (38). In each verb, the [h] is from the second person plural person marker /šh/ and the /l/ is a classifier. The ii. examples reveal the underlying [l] classifier.

(39) a. i. [gha-na-gu-4-yax] 'you (pl.) were playing ball' A
   adv dur deriv clsf stem
   2  4  8  13  14
   (FL. IRR.)
   ii. [gha-na-gu-l-yax] 'he was playing ball' A (FL. IRR.)
   adv dur deriv clsf stem
   2  4  8  13  14

b. i. [gha-4-gwat] 'you (pl.) were crawling' B
   perf clsf stem
   10  13  14
   ii. [gha-l-gwat] 'he was crawling' B
   perf clsf stem
   10  13  14

c. i. [baen-ta-2a-4-?ill] 'you (pl) swam away from it' A
   post deriv perf clsf stem
   1  9  10  13  14
   (FL. IRR.)
These data can be accounted for by the following rule.

**Continuant Coalescence**

\[
\begin{align*}
C & \quad C & \quad C \\
[-vce] & \quad [+cont] & \rightarrow [-vce] \\
[+lat] & & [+lat] \\
[-vce] & & [-vce]
\end{align*}
\]

**Domain of Continuant Coalescence.** Again, following Kiparsky's Strong Domain Hypothesis, Continuant Coalescence is assigned to level 1 exclusively since this is the only level where its environment is met.

**Continuant Deletion.** In the examples below, the strategy used to eliminate clusters of continuants is deletion rather than coalescence. When two continuants occur adjacent to each other, one of them always deletes. This includes affricates whose second member is [+continuant].

The following data are organized by consonant type. In each section, all i. examples are the result of the affixation of the alveolar continuant /s/ (first person singular person marker). All ii. examples reveal the underlying form of the string. In the i. examples the second continuant (i.e. the
rightmost) deletes.

(40) /s/ and /z/
   a. i. [tae-s-ul] /tae-s-zul/ 'I am going to start being good' A
derv pm stem
  8 12 14
   ii. [tae-zul] 'he is going to start being good' A
derv stem
   8 14

   b. i. [he-s-un] /he-s-zun/ 'I am good' A
derv pm stem
  8 12 14
   ii. [he-zun] 'he is good' A
derv stem
   8 14

   c. i. [he-s-uh] /he-s-zuh/ 'I am not good' A
derv pm stem
  8 12 14
   ii. [he-zuh] 'he is not good' A
derv stem
   8 14

(41) /s/ and /ts/
   a. i. [tae-s-ih] /tae-s-tsih/ 'I am shooting' A
derv pm stem
  8 12 14
   ii. [tae-tsih] 'he is shooting' A
derv stem
   8 14
b. i. [ʔa-tə-ʔa-s-i] /ʔɛ-te-ʔa-s-tsi/ 'I shoot NP' A

   obj derv perf pm stem
6  8  10  12  14

ii. [ʔa-tə-ʔai-n-tsi] 'you shoot NP' B

   obj derv perf pm stem
5  8  10  12  14

c. i. [hu-dae-s-i] /hu-dae-s-tsi/ 'I shot NP' A

   derv derv pm stem
8  8  12  14

ii. [ho^w-əh-tsi] 'you (pl.) shot NP' A

   derv pm stem
8  12  14

(42) /s/ and /y/

a. i. [dae-s-əh] /dae-s-γh/ 'I arrived' A

   derv pm stem
8  12  14

ii. [day-γh] /dae-in-γh/ 'you arrived' A

   derv pm stem
8  12  14

(/n/ deletes after it nasalizes the preceding vowel).

b. i. [nɛ-s-aeh] /nɛ-s-yaeh/ 'I just arrived (somewhere),'

   perf pm stem
10  12  14

ii. [ni-yaeh] 'he just arrived (somewhere)' A

   perf stem
10  14

c. i. [tae-s-aeh] /tae-s-yaeh/ 'I am going to arrive' A

   derv pm stem
8  12  14
ii. [tae_yaeh] 'he is going to arrive'  

derv stem  
8 14

(43) /s/ and /l/

a. i. [gha-s-[key]] /gha-s-l-[kiy]/ 'I vomited'  

perf pm clsf stem  
10 12 13 14

ii. [gha-l-[key]] 'he vomited'  

perf clsf stem  
10 13 14

b. i. [gha-s-[gwat]] /gha-s-l-[gwat]/ 'I was crawling'  

perf pm clsf stem  
10 12 13 14

ii. [ghi-l-[gwat]] 'you were crawling'  

perf pm clsf stem  
10 12 13 14

(the /n/ has deleted after nasalizing the preceding vowel.)

c. i. [he-s-gi] /he-s-l-gi/ 'I run'  

derv pm clsf stem  
8 12 13 14

ii. [he-l-gi] 'you run'  

derv pm clsf stem  
8 12 13 14

(44) /s/ and /æ/ 

a. i. [te-s-ax] /te-s-æ-zaex/ 'I am spitting'  

derv pm clsf stem  
9 10 13 14
I assume an iterative order of application of the deletion rule for this example. First /z/ will delete then /ʒ/.

ii. [te-ʒ-ax] 'he is spitting' A
derv clsf stem
8 13 14

b. i. [tae-s-ʒ-həs] /tae-s-ʒ-ghəs/ 'I am going to tickle NP' A
derv pm clsf stem
8 10 13 14

ii. [tae-ʒ-həs] 'he is going to tickle NP' A
derv clsf stem
8 10 14

c. i. [ta-2a-s-ʒ-kət] /te-2e-s-ʒ-ƙət/ 'I broke NP' A
derv perf pm clsf stem
8 10 12 13 14

ii. [ta-2a-ʒ-kət] 'he broke NP' A
derv perf clsf stem
8 10 13 14

As shown by the above data, when there is a series of two continuants present in the string the rightmost one deletes, leaving the first person singular /s/ intact. The following rule accounts for these data.

**Continuant Deletion**

\[
C \rightarrow \emptyset / C
\]

\begin{align*}
(+\text{cont}) & \quad (+\text{cont}) \\
(+\text{cor}) & \quad (+\text{cor}) \\
\end{align*}
Domain of Continuant Deletion. Following the Strong Domain Hypothesis Continuant Deletion can be assigned to level I since its environment is not met at any other level.

4.2.4 Vowel Rounding

This occurs when the optative marker /gh\^wε/ is present in a string; the vowel to the right becomes round (after Vowel Deletion I has applied). I have included the discussion of this rule here and assume that it applies only at level 1 because I do not have any examples of the optative mode where prefixes occur to the left of /gh\^wε/.

(45) a. /gh\^wε-id-d\^3εn/ \(\rightarrow\) [gh\^w-od-d\^3εn] 'let's sing' B
   opt pm stem
   10 12 14

   b. /gh\^wε-in-d\^3εn/ \(\rightarrow\) [gh\^w-on-d\^3εn] '(they asked) you to sing' B

   c. /gh\^wε-s-t\^s\^\text{a}eh/ \(\rightarrow\) [gh\^w\^\text{a}-s-t\^s\^\text{a}eh] 'I am thinking about being big' A
To account for these data I propose that the optative affix /gh\varepsilon/ has attached to it the autosegmental feature [+round] which will spread to the right. The following rule can be written.

**Vowel Rounding**

Spread the feature [+round] to the right.

**Derivations:**

\[
\begin{array}{c}
\vdash \\
/gh\varepsilon-s-zu/ \rightarrow [gh\partial-a-s-u] \text{ 'I am thinking about being good'} \\
\end{array}
\]

(Continuant Deletion has applied deleting the /z/ of the stem)

(/\varepsilon/ \rightarrow [\partial] as /\varepsilon/ has no [+round] counterpart for these speakers.)

4.3 **Summary**

In conclusion we have the following rule system:

**Level 1:**

1) Vowel Deletion I
2) Vowel Rounding
3) Continuant Deletion
4) i-Lowering
5) Continuant Coalescence
6) D-effect
7) Fricative Voicing
8) Velar Harmony
9) Alveolar Harmony

Crucial Ordering
4,8; 4,9.

FOOTNOTES CHAPTER 4

1. It has been suggested (Kari 1975) that these variations are the vestiges of two earlier phonological processes—stem suffixation and stem vowel ablaut. I will not attempt to trace the Chilcotin developments of these processes here.

2. The modern Chilcotin classifiers (d, l, ɬ, and ʃ) derive from "a far more complex system of classifiers than is found in the Athapaskan languages today" (Hoijer 1948). See also Krauss (1969) for further discussion of a pre-Athapaskan set of classifiers. I will not mark the ʃ classifier after the discussion of it in this section.
3. Hargus (1985) has a rule of Conjugation /a/ Deletion for Sekani whereby the /a/ of the conjunct affix (/gha/, /sa/ or /na/) deletes when there are no affixes intervening between it and the stem. This appears to be the regular case in my data if the prefix is assumed to be /na/. Conjunct /n/ is found only in the third person, which is null phonologically. Thus, as in Sekani, there are no affixes intervening between the conjunct marker and the stem.

A form of the Sekani rule of Conjugation /a/ Deletion seems to apply to the /\#i/ perfective affix in Chilcotin and delete the vowel /i/. In the third person s (or z) is found rather than the full /\#i/ (or [zi]). This can be seen in the data below.

\[\text{[tu tæ-\#-len]} \quad '\text{water is flowing'} \quad A\]

'water' derv perf stem
9 10 14

\[\text{[d\#æ-tæ-\#-tael]} \quad '\text{they kicked'} \quad B\]

subj derv perf stem
6 9 10 14

\[\text{[ya-\#-g\#at]} \quad '\text{he poked somebody'} \quad A\]

obv perf stem
7 10 14

Instead of classifying this /\#/ as a true conjunct affix as does Hargus, however, I will restrict it to the mode set
(marking perfective), and assume that [i] deletes in the third person. The perfective never co-occurs with any other modal affix (though conjunct /n/ does), and functions the same as the regular /si/ perfective marker.

I thus have only one conjunct affix, /n/, which co-occurs freely with seriative /ghi/ and perfective /ni/ when the subject is third person.

4. Hoijer (1948) has noted the following distinctions among the perfective affixes for Athapaskan in general:

- /ni/: an action that is to a point or completive
- /ghi/: an action that is from a point or static
- /si/: an action that is static

5. I use C's to abbreviate an X slot that is dominated by an onset or coda and V to abbreviate an X slot dominated by a nucleus. Also I assume in accordance with the central tenet of autosegmental stability that deletion on the skeletal tier does not entail segmental deletion.

6. Evidence that the person marker /id/ was indeed affixed is found in its behavior with the classifier /4/. Here /d+4/ → [1].

7. I am simply assuming the existence of level 3 here. Actual evidence for level 3 will be provided in Chapter 6.
8. Further evidence for /ni/ belonging to level 2 is found in the following example:

/ni-eh-1-ʔaeH/ → [ni-4-ʔaeH] 'you (pl.) look at it' A
derv pm clsf stem
8 12 13 14

If /ni/ were a level 1 affix, it would be subject to Vowel Deletion I, whereby the /i/ of /ni/ would delete upon affixation to the person marker /ʔeh/ (second person plural).

9. The function of /bi/ here is not entirely clear. It occurs in 'push away', 'push into' and 'push over' but not in 'push NP'. If it were a post-position, it would occur to the left of the adverb /nae/. See Witherspoon (1977) for a discussion of the /bi/ affix in Navaho.

10. The choice is seemingly arbitrary which feature spreads. I assume leftward spread in accordance with other rules of leftward spread in my analysis.

11. Fricative Voicing also applies to possessive pronoun-noun concatenations as shown below.

[saí] 'belt' [sa - ʔai] 'my belt'
[saɛk'í] 'cow' [sa - ʔɛk'í] 'my cow'
Possessive pronouns must thus be affixed at level 1.

12. This phenomenon is common in Athapaskan languages. See Krauss (1969) and Hargus (1985) for further discussion.

13. I have no examples of /d + gh/. See Krauss (1975:15).

14. There are some examples from speaker A (which I cannot account for) where the /s/ person marker has deleted.

[qil] 'bread' [sε - lil] 'my bread'
[qln] 'dog' [sε - lin] 'my dog'

(All examples are from speaker E.)

15. I am assuming that [+cont] (from the /s/) in the affricate /ts/ will prevail over the [-cont] /t/. However, when the affricate following /s/ is the derived affricate [dz] (d
classifier plus /z/ stem), the /s/ does not delete. Perhaps at this stage the /d/ classifier and the [z] initial stem have not been syllabified into an affricate.

[na-gha-s-d-zun] 'I am good again' A
adv der v pm clsf stem  
2 9 12 13 14

[na-gha-s-d-zuhl] 'I often become good' A
adv ser pm clsf stem  
2 10 12 13 14

[nae-te-s-d-zun] I am going to be good again' A
adv der v pm clsf stem  
2 9 12 13 14
CHAPTER 5: THE LEXICAL PHONOLOGY OF CHILCOTIN: LEVEL 2

5.1 Morphology

The following list of affixes comprises level 2:

<table>
<thead>
<tr>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object</strong></td>
<td><strong>Subject</strong></td>
<td><strong>Obviative</strong></td>
<td><strong>Derivative</strong></td>
</tr>
<tr>
<td><strong>Pronouns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ε (unspecified)</td>
<td>dε (3pl.)</td>
<td>yε</td>
<td>dae</td>
</tr>
<tr>
<td>hae (areal)</td>
<td>ts'ε</td>
<td></td>
<td>ni</td>
</tr>
<tr>
<td>sε (1sg.)</td>
<td></td>
<td></td>
<td>ye</td>
</tr>
<tr>
<td>nε (2sg.)</td>
<td></td>
<td></td>
<td>gu</td>
</tr>
<tr>
<td>gwe (3sg.)</td>
<td></td>
<td></td>
<td>de</td>
</tr>
<tr>
<td>we (1pl.)</td>
<td></td>
<td></td>
<td>i</td>
</tr>
<tr>
<td>we (2pl.)</td>
<td></td>
<td></td>
<td>nae</td>
</tr>
<tr>
<td>gwebe (3pl.)</td>
<td></td>
<td></td>
<td>ghe</td>
</tr>
</tbody>
</table>

Affixes 5, 6, and 7 are semantically similar in that they all express information regarding the subject or object of the verb. The derivative affixes (8) are mainly idiosyncratic (as were the derivative affixes of level 1).

5.1.1 Derivative Affixes

Listed below are the stems, with examples, in which the idiosyncratic derivative affixes occur, followed by the non-idiosyncratic affixes [hu] and [tae].
(1) /dae/  'float', 'shake', 'fall', 'roll', 'stop', 'follow', 'arrive', 'burn'

a. [tɛ-dae-s-lɛ4] 'I am floating' A

adv derv pm stem
2 8 12 14

b. [dae-ɔ̞-s-tə] 'I am shaking' B (FL. IRR.)

derv perf pm stem
8 10 12 14

c. [da-tə-ɔ̞-s-tsət] 'I fell down' A

der derv perf pm stem
8 9 10 12 14

d. NP [gʷ-da-y-4-məl] 'I rolled the NP (down the hill)' E

obj derv derv clsf stem
5 8 8 13 14

e. NP [sɛ-da-y-4-ti] 'NP stopped me' E

obj derv derv clsf stem
5 8 8 13 14

f. NP [dɔ̞-da-y-n-dil] 'they followed me' A

subj derv derv conj stem
6 8 8 11 14

g. [dɔ̞-da-y-n-dil] 'they just arrived' A

subj derv derv conj stem
6 8 8 11 14

(2) /ni/  'look at', 'fence'

a. [gʷ-ni-4-ʔaeh] 'you (pl.) look at it' A

obj derv clsf stem
5 8 13 14
b. [na-ne-s-tlon] 'fence' (Krauss 1975)

(3) /ye/ 'think'
   a. [dʒi-ye-ne-zun] 'they are thinking' A
      subj der v der v stem
        6 8 9 14

(4) /gu/ 'happy', 'want', 'be', 'hungry'
   a. [dʒe-gu-n-t'in] 'they are happy' D
      subj der v conj stem
        6 8 11 14
   b. [4aen gu-li] 'there is a lot' D
      a lot der v stem
        8 14
   c. [go-2e-n-t'in] 'you want (to sing) B (FL. IRR.)
      der v perf conj stem
        8 10 11 14
   d. [go-ta-2o] 'we are going to be hungry' D
      der v der v stem
        8 8 14

(See Hargus pg. 111 regarding occurrence of more than one deriva
tional affix of the same class.)

(5) /de/ 'grind'
   a. NP [də-na-l-dəz] 'ground NP' A
      der v der v clsf stem
        8 9 13 14
(6) /i/ (This affix always co-occurs with another affix from level 2)

a. NP [ʔi-gu-t'ın] 'it looks like NP' E

derv derv stem
8 8 14

(I assume that this /ʔi/ is the same affix that occurs in /d3e-ye-nae-i-4-ʔin/ 'they looked at it' A. It must therefore be a level 2 and not a level 3 affix since it occurs to the right of the obviative affix.)

In the following examples /i/ has changed to [y] due to its position in the syllable.

b. [ha-y-ye]h 'I just arrived' A

derv derv stem
8 8 14

c. [da-y-ye]h 'I just arrived (somewhere specific)' A

derv derv stem
8 8 14

d. [ko gʷe-da-y-4-k'aen] 'the house burned down' E

house obj derv derv clsf stem
5 8 8 13 14

e. NP [gʷe-da-y-4-mɛl] 'I rolled the NP down the hill' E

obj derv derv clsf stem
5 8 8 13 14

(7) /nae/. This affix is homophonous with the level 3 durative affix. Due to its placement in b. and c. to the right of the
obviative and object affixes, however, it must be a derivative affix of position 8.

a. NP [g\textsevenscript wē-nae-s-\textasciitilde g\textasciitilde wāt] 'I am shaking NP' B
   obj derv pm stem
   5  8  12  14

b. [d\textsc{s}i-\textsc{yē}-n\textsc{ay}-\textsc{ʔ}-\textsc{ʔ}in] 'they looked at it' A
   subj obv derv clsf stem
   6  7  8  13  14

In the last example, the /nae/ diphtongizes to [nay] due to the presence of the underlying /i/ derivative.

(8) /g\textsc{he}/ 'frighten'

a. [n\textasciitilde a-g\textsc{ha}-n\textasciitilde e-d\textsc{s}ut] 'it frightened you' A
   obj derv perf stem
   5  8  10  14

b. [s\textasciitilde a-g\textsc{ha}-n\textasciitilde e-d\textsc{s}ut] 'it frightened me' A
   obj derv perf stem
   5  8  10  14

/h\textsc{u}/ and /t\textsc{ae}/ are the only affixes that are not completely idiosyncratic in their affixation. /h\textsc{u}/ occurs in seriative verbs and their semelfactive counterparts.

(9) /h\textsc{u}/

a. [h\textasciitilde u-s-d\textsc{s}it] 'I am poking her leg' A
   derv pm stem
   8  12  14
b. [naːɛy hu-tə́] 'the horse is kicking us' B
   horse derv stem
   8 14

c. [gəx nəe-hu-də́e-tsi] 'he is shooting many rabbits' A
   rabbit adv derv derv stem
   2 8 8 14
   (FL. IRR.)

d. [gəx hu-də́e-ta-n-tsaŋ]
   rabbit adv derv derv pm stem
   2 8 8 12 14
   'you are going to shoot a lot of rabbits' A

e. [hu-ni-n-tsi] 'you shot it once' A
   derv perf pm stem
   8 10 12 14

f. [ho-ghe-n-tsi] 'you kicked it many times' B
   derv perf pm stem
   8 10 12 14

g. [ho-ghe-tsi] 'we shot it many times' A
   derv perf stem
   8 10 14
   (In f. and g., the /u/ of /hu/ has flattened to /o/.)

When a level 2 affix occurs to the left of /hu/ there is a coalescence. The h of /hu/ and the vowel of the object affix do not surface.

(10) a. [Mary s-ʊ-tə́e]
   /sə́-hu-tə́e/ 'Mary is kicking me' A
   obj derv stem
   5 8 14
b. [Mary n-u-tae4] /nε-hu-tae4/ 'Mary is kicking you' A
   obj deriv stem
   5 8 14

c. [Mary y-u-tae4] /yε-hu-tae4/ 'Mary is kicking him' A
   obv deriv stem
   5 8 14

/hu/ also occurs idiosyncratically in the following paradigms.

(11) a. [hu-4-nez] 'how tall is she?' A
   deriv clsf stem
   8 13 14

b. 'Heather' [hu-n-dxaen] 'Heather is shy' A
   deriv conj stem
   8 11 14

Because the /h/ of /hu/ does not surface when another affix of level 2 is present I will assume that the /h/ is floating and is only realized when an onset slot is created (see Onset Formation 5.2.2).

/tae/. This affix usually co-occurs with the modal /ghε/ to create the inceptive mode. If /ghε/ is present, /tae/ always flattens to [ta].

(12) a. [ta-gha-t'a$] 'he is going' A
   deriv perf stem
   8 10 14
b. [ta-ghe-t111] 'we are going to sleep' A
   deriv perf stem
   8  10  14

c. [ta-ghe-h-zul] 'you (pl.) are going to be good' A
   deriv perf pm stem
   8  10 12 14

d. [?e-tae-s-dael] 'I am going hunting' A
   obj deriv pm stem
   5  8 12 14

e. [tae-yael] 'he is going to go' A
   deriv stem
   8  14

5.1.2 Obviative

This affix occurs when both subject and object are third
person, as in the following:

(13) a. [yε-tε-1-zax] 'he is spitting NP' A
    obv deriv clsf stem
    7  8 13 14

/yε/ becomes [yo] in the seriative /ghi/ mode.

b. [dzi-ya-ghi-n-tael] 'they kicked them many times' B
   subj obv ser conj stem
   (FL. IRR.)
   6  7 10 12 14
c. [d3i-\textit{yo}-ghε-n-\textit{tsl}] 'they shot it' A

\begin{tabular}{l}
subj obv perf conj stem \\
6 7 10 12 14
\end{tabular}

Although this affix never co-occurs with an object affix, it cannot be classed with the position 5 affixes as it always occurs to the right of the subject marker, position 6.

5.1.3 Subject Affixes

This position is filled by two affixes—/d3ε/ third person plural, and /ts'ε/ fourth person plural (which corresponds to 'one' in English).

(14) /d3ε/

a. [naε-d3ε-tih] 'they are dreaming' C

\begin{tabular}{l}
dur subj stem \\
4 6 14
\end{tabular}

b. [henεs bi-naε-d3ε-kayn] 'they are going in a raft' E

\begin{tabular}{l}
raft adv dur subj stem \\
2 4 6 14
\end{tabular}

The vowel quality of /d3ε/ varies in accordance with the aspect of the verb. It takes the form [d3ae] when the /ghε/ mode is part of the paradigm. However, this mode is usually absent in the third person forms. In the data below, the (ii) examples are non-third person and reveal the presence of the /ghε/ modal affix for each paradigm.
(15) a. i. [nae-d₃æe-d-zun] 'they are good again' A
   adv subj clsf stem
   2  6  13  14

   ii. [na-gha-h-d-zun] 'you (pl.) are good again' A
      adv perf pm clsf stem
      2  10  12  13  14

b. i. [d₃æe-l-gʷat] 'they are crawling' A
   subj clsf stem
   6  13  14

   ii. [gh₃a-l-gʷat] 'he is crawling' B
      perf clsf stem
      10  13  14

c. i. [d₃æe-d₃en] 'they sang' E
   subj stem
   6  14

   ii. [gh₃en-d₃en] 'you sang' E
      perf pm stem
      10  12  14

/d₃e/ also changes to [d₃i] as in [d₃i-n-zun] 'they are good' A. In the optative, /d₃e/ becomes [d₃u].
(16) a. [dzu-dsən] '(they asked us) if we would sing' B
   subj stem
   6 14

b. [dzu-zu] 'they are thinking about being good' B
   subj stem
   6 14

/ts'e/ occurs only in formal speech.

(17) [ts'e-də-mi-l-təl] 'one shot at it' B
   subj derv perf clsf stem
   6 9 10 13 14

5.1.4 Object Affixes

This includes the unspecified object /ε/ and the unspecified areal /hae/, as well as the pronominal direct objects.

(18) /ε/
   a. [ʔε-dε-tə-ɛls] 'they are shooting' B
      obj subj derv stem
      5 6 9 14

b. [ʔa-ta-ʔa-s-tael] 'I kicked' A
      obj derv perf pm stem
      5 9 10 12 14

(19) /hae/
   a. [hæe-tæs-æs] 'I am going to arrive (anywhere)' A
      obj derv pm stem
      5 8 12 14
b. [hae-dza-y-n-dil] 'they arrived there' A
   obj subj deriv conj stem
   5 6 8 11 14

c. [sae hae-ʔael] 'the sun is up (there)' A
   sun obj stem
   5 14

d. [ʔael dzi ha-yah-ʔen] 'the moon is out (there)' A
   moon obj deriv stem
   5 8 14

e. [tl'a da-ha-y-kəl4] 'we are going to sit down (there)' C
   there ? obj deriv stem
   5 8 14

The pronominal direct objects are listed below.

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>se</td>
<td>we</td>
<td></td>
</tr>
<tr>
<td>ne</td>
<td>we</td>
<td></td>
</tr>
<tr>
<td>g'wε</td>
<td>g'wε be</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Level 2 Phonology

One phonological process that distinguishes level 2 from level 1 is Vowel Deletion, which occurs (as was discussed earlier) when two vowels are affixed adjacent to each other in the verb.

5.2.1 Vowel Deletion II

In section 4.7, it was shown that when a series of vowels was produced by affixation at level 1 the leftmost vowel
deleted (Vowel Deletion I). The reverse occurs at level 2. Here, when there are 2 adjacent vowels in the string, the rightmost one deletes.

(20) a. /dae-εh-dil/ $\rightarrow$ [dae-h-dil] 'you (pl.) arrived (somewhere specific)'

derv pm stem
8 12 14

b. /hu-in-tsax/ $\rightarrow$ [hu-n-tsax] 'you are shooting it' A

derv pm stem
8 12 14

c. /ni-εh-1-ʔaeh/ $\rightarrow$ [ni-4-ʔaeh] 'you (pl.) looked at it' (A)

derv pm clsf stem
8 12 13 14

d. /ye-nae-εh-zen/ $\rightarrow$ [ye-nae-h-zen]

obv derv pm stem
7 8 12 14

'you (pl.) are thinking about being good' A
e. /tae-in-zul/ --> [tae-n-zul] 'you are going to start being good'

derv pm stem

8 12 14

In each case, the vowel of the person marker (the rightmost vowel) has deleted. To account for these data the following rule can be written:

Vowel Deletion II

V --> $ / V ___

(These are V's on the skeletal tier.)

5.2.2 Onset Formation

Another phonological process that distinguishes level 2 from level 1 is Onset Formation. At level 2, any vowel initial affixes (including the affix /hu/ whose /h/ is unattached) receive an onset slot. The unattached /h/ will then link up to this newly created onset and the affix will be realized as [hu]. In all other cases the empty onset slot will be filled in post-lexically with the default consonant /ʔ/.

Onset Formation

<table>
<thead>
<tr>
<th>x</th>
<th>x</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>_</td>
<td>_</td>
<td>_</td>
</tr>
</tbody>
</table>

\[ V \rightarrow [ ___ \ V \]
Although this rule is structure-building and not structure-changing, it does obey the SCC and applies only to strings that have had a previous morphological or phonological rule of level 2 apply to them. This rules out application of Onset Formation to strings that enter level 2 with the vowel initial affixes /id/, /in/, and /e/ (12). Although they meet the environmental conditions of Onset Formation, these strings will enter level 3 unchanged unless they have independently met the conditions for Vowel Deletion.

Onset Formation does apply to vowel initial affixes of level 2 as shown in example (21).

(21) a. [ʔi-gu-t'ın] 'it looks like (something)' E
derv derv stem
8 8 14

b. [ʔa-ta-ʔa-s-taɛ] 'I kicked the dog' A
dog obj derv perf pm stem
5 9 10 12 14

c. [ʔɛ-ðxe-te-τsin] 'they are shooting into a group' B
obj subj derv stem
5 6 9 14

When a level 3 affix is added, the empty onset slot prevents vowel deletion, as shown in example 22.

(22) a. [bi-nae-ʔa-ðxe] 'something to write with' (pencil) A
post adv obj stem
1 2 5 14
b. [nae-ʔe-tɛ-tae-ts difficulté] he is going to shoot' A

\[
\begin{array}{cccc}
\text{adv} & \text{obj} & \text{derv} & \text{derv} & \text{stem} \\
2 & 5 & 8 & 8 & 14
\end{array}
\]

Onset Formation also applies at level 3 as well as post-lexically, as shown in (21).

(23) a. [ʔae-nae-n-t'in] 'you work' E

\[
\begin{array}{cccc}
\text{adv} & \text{dur} & \text{pm} & \text{stem} \\
2 & 4 & 12 & 14
\end{array}
\]

b. [ʔas kap] 'child' E

c. [ʔintsi] 'grandfather' E

d. [ʔaeldzi] 'moon' A

Onset Formation must then "turn on" at level 2, and continue to apply throughout the lexical and post-lexical levels.

Having established the distinction between levels 1 and 2 via Vowel Deletion II and Onset Formation, I now turn to a discussion of the phonological processes that create the distinction between levels 2 and 3: Fricative Voicing, and Diphthongization.

5.2.3 Fricative Voicing

Another rule that supports the distinction between levels 2 and 3 is Fricative Voicing. It was shown in Chapter 4 that alveolar fricatives become voiced intervocalically at level 1. The same is true at level 2.
(24) a. \[g\{\text{wa}-\text{zai-ta}\text{4}\}] /g\{\text{e}-\text{si-t}\text{e}\text{4}/ 'I kicked it' B

obj perf stem
5 10 14

b. \[na\{\text{ey dza}-\text{ta}\text{4}\}] /d\{\text{e}-\text{te}\text{4}/ 'they kicked the

horsed subj perf stem
6 10 14

c. \[gu-\text{zai-s-t'in}\] /gu-si-s-t'in/ 'I want to sing' B
derv perf pm stem
8 10 12 14

Fricatives do not voice at level 3.

(25) a. \[na-\text{sa-s-dzit}\] 'I crawled' B

adv perf pm stem
2 10 12 14

b. \[na-\text{sa-tin}\] I dreamt' C
dur perf stem
4 10 14

In each case in (25), the perfective marker has remained as
voiceless /\text{s}/ although it is in intervocalic position.

5.2.4 Diphthongization

The third process that establishes a distinction between
levels 2 and 3 is Diphthongization. When an affix of the form
/Cae/ (where C stands for any consonant) is followed by an
/i/-initial affix, the result is [Cay] as shown in examples
(26) through (30).
(26) a. [da-y-n-le4] /dae-in-le4/ 'you are floating' A
derv pm stem  
8 12 14  
b. [da-y-d-le4] /dae-id-le4/ 'we are floating' A

derv pm stem  
8 12 14  
c. [dae-le4] /dae-le4/ 'he is floating' A

derv stem  
8 14  
d. [d3e-dae-le4] /d3e-dae-le4/ 'they are floating' A

subj derv stem  
6 8 14

(27) a. [da-y-yeh] /dae-i-yeh/ 'he arrived' A

derv derv stem  
8 8 14  
b. [d3e-dae-y-n-dil] /d3e-dae-i-n-dil/ 'they arrived' A

subj derv derv conj stem  
6 8 8 11 14  
c. [da-y-yeh] /dae-i-in-yeh/ 'you arrived' A

derv derv pm stem  
8 8 12 14

(28)  
a. [na-y-4-?in] /nae-i-4-?in/ 'he looked at it' A

dur derv clsf stem  
4 8 13 14  
b. [d3l-ye-na-y-4-?in] /d3e-ye-nae-i-4-?in/

subj obv derv derv clsf stem  
6 7 8 8 13 14  
'they looked at it' A
Nuclear Fusion\(^1\) changes the prosodic organization of the sequence /ae-i/ by combining them under one nucleus node.

\[\begin{array}{ccc}
N & N & N \\
\mid & \mid & \mid \\
X & X & X \\
\mid & \mid & \mid \\
ae & i & ae & i
\end{array}\]

Low level phonetic rules will change /i/ to [y] due to its postion in the syllable- the second half of a branching nucleus.

The Obligatory Contour Principle (OCP) will change /ae-y/ to [ay] since both [ae] and [y] are [-back]. Because [ae] is the more marked element it will lose its [-back] feature and become [a].
Domain of Nuclear Fusion. Nuclear Fusion can be ordered at level 1, in accordance with the Strong Domain Hypothesis, since there are no instances of the sequence /ae-i/ at level 1. It does not, however, apply at level 3, as shown by the data below. Instead Vowel Deletion II will apply deleting the rightmost vowel.

(31) a. [nae-dʒi\text{-}t] /\underline{nae\text{-}in\text{-}dʒi\text{-}t}/ 'you crawled around' B
   adv pm stem
   2 12 14

b. [nae-dʒi\text{-}t] /\underline{nae\text{-}id\text{-}dʒi\text{-}t}/ 'we crawled around' B
   adv pm stem
   2 12 14

5.2.5 ε-Raising

Unlike i-Lowering at level 1 where /i/ \rightarrow [ε] /__s, /ε/ raises to [i] at level 2 when it occurs before [y], as can be seen in the following data where /dʒε/ becomes [dʒi] when it is affixed to the left of the [y] initial obviative affix.

(32) a. [dʒi\text{-}yə\text{-}ghe\text{-}n\text{-}tsi] 'they shot it (many times)' A
   subj obv ser conj stem
   6 7 10 11 14

b. [dʒi\text{-}yə\text{-}ghe\text{-}n\text{-}tə\text{el}] 'they kicked it (many times)' B
   subj obv ser conj stem
   6 7 10 11 14

c. [na4ey dʒi\text{-}ya\text{-}ż\text{-}tat] 'they kicked the horse' B
   horse subj derv perf stem
   6 8 10 14
In contrast to this, the following examples illustrate the underlying form of the subject prefix (/dje/).

(33) a. [nae-ðxe-d-zwh] 'they often become good' A
   adv subj clsf stem
   2  6  13  14

b. [ðxe-ti-4-kat] 'they broke the window' A
   subj derv clsf stem
   6  8  13  14

The following rule accounts for /ɛ/ raising to [i].

ε-Raising

\[
\begin{array}{c}
  \text{V} \\
  \text{C} \\
  [\text{+cont}]
\end{array}
\]

\[
\begin{array}{c}
  [-\text{low}] \\
  [+\text{high}]
\end{array}
\]

Domain of ε-Raising. I have no evidence of this rule applying elsewhere in my data, since the sequence /ɛ - y/ is found only at level 2. Although this rule applies only to level 2 affixes, it is assigned to level 1 following Kiparsky (1984), since this is the least marked level for assigning rules.

Vowel Deletion III

Repeated below is example 10 from 5.1.1. The labelled
brackets refer to the level at which the affix was added. (Recall that while /h/ is present on the segmental tier it has no corresponding skeletal point and is thus invisible to the vowel deletion rules).

(10) a. [Mary s-u-tae4] 2[sε-2[hu-1[tae4]]] 'Mary is kicking me' A

\begin{align*}
\text{obj deriv stem} & \\
 5 & 8 & 14
\end{align*}

b. [Mary n-u-tae4] 2[nε-2[hu-1[tae4]]] 'Mary is kicking you' B

\begin{align*}
\text{obj deriv stem} & \\
 5 & 8 & 14
\end{align*}

c. [Mary y-u-tae4] 2[yε-2[hu-1[tae4]]] 'Mary is kicking him' B

\begin{align*}
\text{obv deriv stem} & \\
 7 & 8 & 14
\end{align*}

Vowel Deletion II would delete the rightmost vowel /u/.

However, this would give the incorrect result. It is the leftmost vowel /ε/ that deletes leaving the /u/ intact. There must then be a third rule of vowel deletion that will delete the leftmost vowel for the examples above but will leave it intact in example 20 of section 5.2.1.

One difference between the examples in 10 and those in 20
is that all of the examples in 10 are the result of a level 2 affix added to another level 2 affix. In the examples in 20 the CV affixes of level 2 are added to a level 1 affix (a person marker). The third rule of vowel deletion can refer to this inner bracketing since the inner brackets are not erased until the end of a level (see Kiparsky 1982).

**Vowel Deletion III**

\[ 2[C V ] 2[V] \rightarrow 2[C \ 2[V] \]

5.3 **Conclusion**

The following rules apply to level 2 affixes. I have simply listed the rules that have been discussed in this Chapter. At the end of Chapter 6 the rules will be re-ordered at the optimal level at which they can apply.

1. Vowel Deletion II
2. Onset Formation
3. Fricative Voicing
4. Nuclear Fusion
5. \( \epsilon \)-Raising
6. Vowel Deletion III
FOOTNOTES CHAPTER 5

1. This was suggested to me by Dr. Patricia Shaw.
6.1 Morphology

The following affix positions comprise level 3:

\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
\text{postposition} & \text{adverb} & \text{stem} & \text{durative}
\end{array}
\]

6.1.1 Durative

The durative affix /nae/ occurs in verbs where the action described spreads over a period of time. This is opposed to verbs that express an instantaneous action (such as 'kick' and 'shoot').

(1) a. [nae-\text{\-}si-tin] 'I dreamt' C
\[
\begin{array}{c}
dur \text{ perf} \text{ stem} \\
4 & 10 & 14
\end{array}
\]

b. [na-\text{\-}se-bin] 'I swam' A
\[
\begin{array}{c}
dur \text{ perf} \text{ stem} \\
4 & 10 & 14
\end{array}
\]

c. [na-ghi-tsun] 'you kissed him long' B (FL. IRR.)
\[
\begin{array}{c}
dur \text{ perf} \text{ stem} \\
4 & 10 & 14
\end{array}
\]

d. [na-gha-s-d-zun] 'I am good again' A
\[
\begin{array}{c}
dur \text{ perf pm clsf stem} \\
4 & 10 & 12 & 13 & 14
\end{array}
\]
e. [nae-g̃e-dζel] 'it snowed' E
   dur obj stem
   4  5  14

f. [næ-nae-tae-s-t'în] 'I am going to work' E
   adv dur derv pm stem
   2  4  8  10  14

6.1.2 Stems
I have only one example of an incorporated stem in my data, although incorporation is a productive process in Chilcotin.

(2) a. [bi-na-ẑai-g̃a-k'än] 'something to color your mouth with (lipstick)' A
   post poss noun obj stem
   1  3  5  14

   b. [sa-ẑai] 'my mouth' E
      my mouth

6.1.3 Adverbs
There is a variety of idiosyncratic level 3 adverbs. A few examples follow.
(3) a. [gha-na-g̃e-dζe-l-yax] 'they are playing ball' A
   adv dur obj subj clsf stem
   (FL. IRR.)
   2  4  5  6  13  14

   b. [næe-dζe-daen] 'they are drinking' A
   adv subj stem
   2  6  14
c. [tɛ-dɔe-dae-lɛ4] 'they are floating' A

adv subj derv stem
2 6 8 14

d. [hae-dɔe-ɛl] 'they are saying' D

adv subj stem
2 6 14

e. [tɛ-nae-dzi-ya-ga-l-tʃut] 'they caught it again' A

adv adv subj obv perf clsf stem
2 2 6 7 10 13 14

f. [nae-bi-ti-zi-tʃat] 'he pushed you around' B

adv ? derv perf stem
2 9 10 14

(The speech of B frequently did not manifest flattening.)

g. [bi-na-gha-s-tʃey] 'I vomited it' A

post adv perf pm stem
1 2 10 12 14

h. [ʔae-nae-n-t'in] 'you are working' E

adv dur pm stem
2 4 12 14

i. [ʔae-n-la] 'NP made NP' E (FL. IRR.)

adv conj stem
2 11 14

6.1.4 Postpositions

There are two types of postpositions. One is a combination of postposition and pronoun (e.g. 'from'-pronoun). The other is /bi/, usually translated as 'with'
(4) 'from'-pronoun

a. [naen-ta-že-n-bin] 'you swam away from you' A
   post derv perf pm stem
   1  9 10 12 14

b. [saen-ta-že-n-bin] 'you swam away from me' A
   post derv perf pm stem
   1  9 10 12 14

c. [baen-ta-že-n-bin] 'you swam away from them' A
   post derv perf pm stem
   1  9 10 12 14

(5) /bi/

a. [bi-tae-daen] 'something to drink with (cup)' A
   post adv stem
   1  2 14

b. [bi-nae-ʔa-daz] 'something to write with (pencil)' A
   post adv obj stem
   1  2  5 14

c. [bi-nae-na-ʔa] 'something to make holes with (sewing machine)' A
   post adv dur stem
   1  2  4 14

d. [bi-yae-s-taʔ] 'I am talking into something' A
   post derv pm stem
   1  8 12 14

e. [bi-tae-1-daen] 'make her drink' A
   post adv clsf stem
   1  2 13 14
f. [NP bi-dxe-tae-1-zax] 'they are going to spit' A
   post subj deriv clsf stem
   1  6  8  13  14

(See Witherspoon (1977) for further discussion of the /bi/ affix in Athapaskan.)

6.2 Level 3 Phonology

There are only two rules that apply to level 3 affixes—Vowel Deletion II and Onset Formation. No new rules are assigned to level 3. With the exception of Vowel Deletion II and Onset Formation, all other level 1 and level 2 rules shut-off.

6.2.1 Vowel Deletion II

As was shown in Chapter 5, when a series of 2 vowels occurs the rightmost one deletes at level 2. This is also true at level 3.

(6) a. /tae-in-daen/ --> [tae-daen] 'you are drinking' C

   adv pm stem
   2  12  14

b. /tae-eh-daen/ --> [tae-daen] 'you (pl.) are drinking' C

   adv pm stem
   2  12  14

c. /?ae-nae-in-t'in/ --> [?ae-nae-n-t'in] 'you are working' E

   adv dur pm stem
   2  4  12  14
6.2.2 **Onset Formation**

It was also shown in Chapter 5 that Onset Formation applies at level 3 (as well as word internally at level 2), creating an empty onset slot before vowel initial affixes (which will be filled in by the default consonant /*ʔ*/). Example (23)a from Chapter 5 is repeated below.

```
[ʔae-nae-n-t'in] 'you work' E
adv dur pm stem
2  4  12  14
```

6.3 **Summary**

Only 2 phonological rules apply at level 3—Vowel Deletion II, and Onset Formation. All other rules that applied at levels 1 and 2 have shut-off. Listed below (in their optimal order) is the rule system that has been developed in this thesis for the lexical component of Chilcotin.

**LEVEL 1**
1. Vowel Deletion I
2. Vowel Rounding
3. Continuant Deletion
4. i-Lowering
5. d-Effect
6. Fricative Voicing
7. e-Raising
8. Continuant Coalescence
9. Velar Harmony
10. Alveolar Harmony

Crucially ordered; 4,9; 4,10

LEVEL 2

Vowel Deletion I shut off

I-Lowering shut off

(I assume that all other level 1 rules that have not shut-off may also apply here. I have not, however, listed them).

1. Vowel Deletion II
2. Vowel Deletion III
3. Onset Formation
4. Nuclear Fusion

LEVEL 3

Fricative Voicing shut off

Nuclear Fusion shut off
CHAPTER 7: POST-LEXICAL PHONOLOGY

7.0 Introduction

Post-lexical rules apply "across the board" wherever their environment is met (Kiparsky 1982. Nasalization, /ghε/ contraction, /gh/ Deletion, and Onset Default are all post-lexical rules in Chilcotin.

7.1 Nasalization

Nasal vowels occur when underlyingly they are followed by a homo-syllabic nasal which is in turn followed by a continuant. There is variation in my data as to whether or not the following continuant must be homosyllabic with the nasal consonant (see Cook 1986). In example 1 below the continuant is homosyllabic with the nasal consonant and a nasal vowel results.

(1) a. [bi-ta-ŋ-zax] /bi-tae-in-zex/ 'you will spit' A
    post deriv pm stem
    1 8 12 14

b. [ta-ŋ-tak] /tae-in-4-tεk/ 'you will shoot' A
    deriv pm clsf stem
    8 12 13

c. [ta-ŋe-1-gey] /te-ŋi-in-1-giy] 'you are walking' E
    deriv perf pm clsf stem
    8 10 12 13
d. [hə-l-gi] /hɛ-in-l-gi/ 'you run' E
derv pm clsf stem
8 12 13 14

In example 2 the vowel becomes nasalized although the continuant is not homosyllabic.

(2) a. [da-y-yeh] /dae-in-yeh/ 'you arrived (somewhere)' A
derv pm stem
8 12 14

b. [hi-zΩh] /he-in-zΩh/ *you are not good' A
derv pm stem
8 12 14

c. [i4i] /in4i/ 'one E

Example 3 appears to be counter evidence to example 2. Here the vowel does not nasalize when the following continuant is not homosyllabic.

(3) a. [ghi-n-li] /ghi-n-li/ 'it used to be that way' A
mode conj stem
10 11 14

b. [ta-n-zeΩ] /tae-n-zeΩx/ 'he is going to spit' A
derv conj stem
8 11 14

c. [?ae-n-la] /?ae-n-laegh/ 'he is making NP' E
adv conj stem
1 11 14

Further research needs to be done on the interaction between tone and nasalization. In all of the examples that did
not nasalize the affix involved was the conjunct. I will not attempt to write a rule here as I think the nasalization process is related to the tone rules.

7.2 /gh/ Contraction

In fast speech the perfective marker /ghɛ/ is often deleted in intervocalic position after having retracted the vowel to its left. All of the cases of /ghɛ/ contraction involve the inceptive mode: /tae/ (8) and /ghɛ/ (10). Without both /tae/ and /ghɛ/ having been present, the verb cannot be translated as the inceptive. This, and the fact that the vowel to the left of the missing /ghɛ/ is [+RTR], rule out the possibility of /ghɛ/ never having been added to the string at all.

(4) a. /tae-ghɛ-t'ɛs/ --> [ta-t'ɛs] 'he is going to cut' A
derv perf stem
8 10 14

b. /tae-ghɛ-in-tsɛ4/ --> [ta-n-tsɛ4] 'you are going to swing' E
derv perf pm stem
8 10 12 14

c. /gutfa gu-tae-ghɛ-žu/ --> [gutfa go-ta-žo]
insides derv derv perf stem
8 8 10 14

'their insides will be numb (they are going to be hungry)' E

This process can be accounted for by the following rule.
**gh Contraction**

\[ gh \rightarrow \_ / V \_ / V \]

(the vowel of /ghε/ will delete via one of the vowel deletion rules).

### 7.3 Velar Deletion

The [+RTR] velar /gh/ also deletes in syllable final position after RTR Harmony and nasalization have applied. The only examples of syllable final /gh/ are in non-derived lexical items.

(5) a. /kungh/ \(\rightarrow\) [kɬ] 'house' E

   b. /naenghɪngh/ \(\rightarrow\) [nɬɪɛγy] 'horse' E

   c. /bilugh/ \(\rightarrow\) [bilo] 'knife' E

   d. /midugh/ \(\rightarrow\) [mido] 'whiteman' E

The following rule can account for these data.

**Velar Deletion**

\[
\text{rime} \\
\]

\[ gh \rightarrow \_ / \_ / \]


This rule must be ordered after RTR Velar Harmony due to the fact that the adjacent vowels are all [+RTR].

7.4 **Onset Default**

It was shown earlier that vowel initial affixes all receive an onset slot at levels 2 and 3. This slot is filled in with /ʔ/ postlexically. This is illustrated in example 6.

(6) a. [ʔi-gu-t'í] 'it looks like (something)' E
   
   deriv deriv stem
   8 8 14

b. [nae-ʔe-tɛ-tae-tsih] 'he is going to shoot' A
   adv obj deriv deriv stem
   2 5 8 8 14

c. [bi-nae-ʔa-dǝʔǝl] 'something to write with' A
   
   post adv obj stem
   1 2 5 14

The following rule accounts for these data.

**Onset Default**

\[
\# \rightarrow \mathbf{ʔ}/ ̂\]
7.5 **Summary**

The following rules apply at the post-lexical level.

1. Nasalization
2. gh Contraction
3. Velar Deletion
4. Onset Default

7.6 **Summary of Thesis**

In conclusion, the following rule system has been developed.

**LEVEL 1**

1. Vowel Deletion I
2. Vowel Rounding
3. Continuant Deletion
4. i-Lowering
5. D-effect
6. Fricative Voicing
7. Continuant Coalescence
8. e-Raising
9. Alveolar Harmony
10. Velar Harmony

Crucial Orderings; 4,9; 4,10.
LEVEL 2

Vowel Deletion I shuts off
1-Lowering shuts off

1. Onset Formation
2. Vowel Deletion II
3. Vowel Deletion III
4. Nuclear Fusion

LEVEL 3

Fricative Voicing shuts off
Nuclear Fusion shuts off

POST LEXICAL

1. Velar Deletion
2. gh Contraction
3. Onset Default

It has been shown that some complex issues of Chilcotin morphology and phonology become clearer when the theory of lexical phonology is used to analyse them. The clustering of rules around groups of affixes is a consequence of phonological
rules being assigned to morphological levels. What seems to be an intricate system of rules becomes somewhat simpler where rule application is determined by conditions such as the Strict Cycle Condition (Kiparsky 1982) (sections 3.1 and 5.2.2), the Strong Domain Hypothesis (Kiparsky 1982) (section 5.5.2) and the Obligatory Contour Principle (section 5.2.5).
Abbreviations Used in This Thesis

adv Adverb
clsf Classifier
cnj Conjunct
derv Derivative
dur Durative
FL. IRR. Flattening Irregular
imp Imperfective
LP Lexical Phonology
obj Object
obv Obviative
OCP Obligatory Contour Principle
perf Perfective
pl. plural
pm Person Marker
post Postposition
SCC Strict Cycle Condition
SDH Strong Domain Hypothesis
ser seriative
sg. singular
subj Subject
WFC Well Formedness Condition
REFERENCES


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