CHAPTER THREE

WORD LEVEL PROSODY IN CHUGACH ALUTIIQ

0.0 INTRODUCTION

The rich prosodic system of the Chugach dialect of Alutiiq is the primary focus of this chapter.¹ I will argue that the distribution of stress, along with several other phenomena in Chugach are accounted for with an uneven, strong, non-tautosyllabic mapping of left headed templates. This is reminiscent of the analyses of Old English and Cayuvava given in chapter two, although there will be differences, e.g., with respect to the treatment of degenerate feet.

The organization of this chapter is as follows. In the first section, background information on the language is provided. My analysis of Chugach is presented in §2. Data illustrating the distribution of primary stress are presented in §2.1. Primary and secondary stress are claimed to be fundamentally different phenomena in Chugach, hence they are discussed and analyzed separately. Before developing an analysis of the distribution of primary stress, the segmental process of fortition which bears on the question of constituency is presented. Having

¹ I would like to take this opportunity to express my gratitude to Jeff Leer of the Alaska Native Language Center, not only for his important published works on Alutiiq, and other languages, but also for his willingness to supply me with unpublished work, to respond to my queries about the minuta of the system, and to engage in stimulating discussion about Chugach and metrical theory. I also thank Michael Krauss of the ANLC for his encouraging notes at various points in my work on this language.

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motivated the existence of metrical constituents in Chugach in §2.2, an analysis of primary stress is argued for in §2.3. §2.4 extends the analysis of primary stress with a discussion of data containing voiceless vowels, which are in most cases not stressable. §2.5 presents the facts about secondary stress and an analysis of those facts. §3 presents a critique of the main previous analysis of Chugach, presented in Leer (1985c).

1.0 THE YUPIK LANGUAGE FAMILY

The major division among the Eskimo branch of the Eskimo–Aleut family is between Inuit, known as Inupiaq in Alaska, and Yupik. Languages of the Inuit sub-group are spoken from northern Alaska across Canada and Greenland. Yupik languages are spoken in Alaska and parts of the Soviet Union. The southern–most Yupik language is known as Alutiiq and has two dialects, Chugach and Koniag. Alutiiq displays the most complicated prosodic system of any language in the family. In fact, the geographical continuum of Yupik languages corresponds to a continuum of complexity in the prosodic systems.3

Central Siberian Yupik is the furthest northwest of the Yupik languages and is spoken in parts of Chukotka in the Soviet Union and on St. Lawrence Island, Alaska. CSY is still being learned by children on St. Lawrence Island, where nearly all of the population (ca. 1000) speaks the language. The Soviet

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2 The material in this section is primarily drawn from Krauss (1985).
3 See Hayes (1989) for a recent metrical treatment of parts of this prosodic complexity continuum.
communities still have speakers, but children are not learning the language. In addition to the references in Krauss (1985), the reader interested in this language is referred to de Reuse (1988).

Moving to the east, the next of the four Yupik languages is Naukanski. Naukanski is spoken only in the Soviet Union and has approximately 150 speakers, almost none of whom are children. The historic geographic continuum which places Naukanski between CSY and CAY has been disrupted by the 1958 resettlement of this population. The resettlement also has hastened the impending death of the language.

Central Alaskan Yupik currently has a far greater number of speakers than any of the other Yupik languages. The geographic area over which dialects of CAY are spoken stretches from Norton Sound in the north to Bristol Bay in the south. The four main dialects of CAY are Norton Sound, Hooper Bay–Chevak, Nunivak and General Central. There are approximately 65 villages in which CAY is spoken by a total of approximately 13,000 individuals, many of whom, according to Krauss, are children. See Woodbury (1981) for extensive discussion of this branch.

The fourth main language is called Pacific Yupik or Alutiiq. Although the term "Pacific Yupik" emphasizes the genetic relationship of this language to the other Yupik languages, the speakers of the language dislike this term. One of the meanings of "yupik" is "eskimo" and the speakers of this language consider themselves to be Aleuts, not Eskimos. The word for "aleut" in this language is "alutiiq," hence that term is preferable for the people and their language. Krauss (1985) reports approximately 900 speakers, but recently (personal communication)
suggests that 700 is probably more accurate. The language is not being learned by children. As noted above, there are two dialects of Alutiiq. The Chugach dialect is spoken around Prince William Sound and on the Kenai Peninsula. The Koniag dialect is spoken on Kodiak Island and on the Alaska Peninsula. Although these are dialects of one language, Leer (personal communication) reports that there is relatively little interaction between the groups and that mutual intelligibility is strained.

The four languages mentioned here are classified as distinct languages by the criterion of mutual intelligibility. Krauss notes that speakers of different Yupik languages understand one another perhaps to the extent that speakers of Spanish, Portuguese and Italian understand one another. The boundary between Alutiiq and CAY is particularly strong, perhaps due to the death of a fifth Yupik language known as Aglurmiut, which was spoken around Bristol Bay (cf. Woodbury 1984). Krauss suggests that this language was between CAY and Alutiiq on the continuum, hence the sharpness of the line between the two remaining languages.

2.0 THE CHUGACH DIALECT OF ALUTIIQ

Of the Yupik languages, the prosodic system of Chugach is deemed the most complex. The data in the present chapter are drawn from the three papers by Leer in Krauss (1985) and from Leer (1989). Data are given in the standard orthography, unless otherwise indicated as being phonetic representations by bracketing.
There are four vowels in Chugach: the “full” vowels /i,u,a/ and a mid-central vowel, for which the orthographic representation “e” is used. The consonants reported by Leer are given in (1). ⁴

(1) Chugach consonant inventory

<table>
<thead>
<tr>
<th>stops:</th>
<th>p</th>
<th>t</th>
<th>c</th>
<th>k</th>
<th>kw</th>
<th>q</th>
</tr>
</thead>
<tbody>
<tr>
<td>fricatives:</td>
<td>l</td>
<td>y</td>
<td>y</td>
<td>w-yw</td>
<td>y</td>
<td>yw</td>
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<td></td>
<td>f</td>
<td>ḥ</td>
<td>s</td>
<td>x</td>
<td>xw</td>
<td>x</td>
</tr>
<tr>
<td>nasals:</td>
<td>m</td>
<td>n</td>
<td>Ṉ</td>
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<td></td>
<td>m</td>
<td>n</td>
<td>Ṉ</td>
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</tbody>
</table>

2.1 Primary stress

In this section, the distribution of primary stress in CA is presented and an analysis is proposed. Secondary stress is relegated to a later section, because primary and secondary stress are two different phenomena in this language.

⁴ Orthography differs in a few cases: in the voiced fricative series, Leer writes the plain velar as 'g', the labialized one as 'w' and the uvulars as 'r' and 'rw' respectively. In the voiceless fricative series, the lateral is written as 'l', the velars as 'gg' and 'g gw' and the uvular as 'rr'. The voiceless nasals are written as 'hN' and the velar nasals are 'ng'. We will use the phonetic symbols in (1) throughout. It is not clear whether the voiceless nasals are predictable; I leave this question aside here.
2.1.1 Words with only light syllables

The stress system of Chugach is quantity sensitive, i.e., syllables with long vowels or diphthongs must be stressed. Before considering data which illustrate this characteristic, data are presented in (2) which have no heavy syllables. Proceeding in this manner highlights some basic characteristics of the analysis to be developed. Primary stress is marked with an acute accent. Some words have more than one such marking since words in Chugach can have multiple instances of equally prominent primary stresses. Multiple primary stresses appear in other Yupik languages as well, e.g. Central Alaskan Yupik, as reported by Woodbury (1981).

(2) Chugach data with only light syllables

| a   | pa.lá.yaq       | ‘rectangular skiff’ |
| b   | qe.ná.wik       | ‘hospital’          |
| c   | qa.yá.kun       | ‘by boat’           |
| d   | a.tún.'ir.túq   | ‘he stopped singing’|
| e   | ta.qú.ma.lu.nf  | ‘apparently getting done’ |
| f   | qa.ngá.te.ra.mék| ‘from a porcupine’   |
| g   | a.kú.tar.tu.nír.tuq | ‘he stopped eating akutaq’ |
| h   | sa.rá.ni.wa.kár.tuq | ‘he is too sleepy’  |

As will be demonstrated below, closed syllables which are word initial are also heavy.
These words illustrate an iterating weak–strong–weak (weak here means "unstressed" and strong means "stressed") pattern across the word from left to right. Where there are three syllables, as in (2a–c), one instance of the weak–strong–weak pattern places stress on the second syllable. Similarly, in words with six syllables, such as (2g–h), there is room for two complete instances of the pattern, placing stress on the second and fifth syllables. The remaining words show that "incomplete" instances of this pattern can appear. For example, the words with five syllables in (2e–f) have stress on the second and fifth syllables. Although there are not enough syllables for a second complete "weak–strong–weak" pattern, there are two syllables remaining, namely the fourth and fifth, which surface as "weak–strong."

The words with four syllables are more complicated. They have stress on the second and fourth syllables. In words of five or six syllables, the fourth syllable would be unstressed; however, in (2d) above the fourth syllable is stressed. This suggests that when there are enough syllables to begin a second iteration of the "weak–strong–weak" pattern, the end result must have a strong syllable. When there is only one syllable remaining, the first "weak" of the pattern is missing and that single remaining syllable becomes strong. Generalizing in metrical terminology, a degenerate foot must be stressed, i.e., it must have a head.

Having presented data in which there are only light syllables, more complicated data are now presented.
2.1.2 Words with heavy syllables

The stress pattern displayed by words which have only light syllables is disrupted when a word contains a heavy syllable. In some languages heavy syllables are only those with long vowels or diphthongs; in other languages, the presence of a coda consonant is sufficient to attract stress. Chugach is the former type, i.e., syllables must have long vowels or diphthongs to be treated as heavy.

The one exception to this generalization is that an initial syllable does not need a long vowel or diphthong to be treated as heavy; initial syllables are heavy if they have a final consonant, even if there is only one vowel. The data in (3) are given to illustrate various patterns with heavy syllables.

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6 This fact seems to be a residual effect of one aspect of Proto-Yupik phonology. In particular, Leer argues that there was a Proto-Yupik rule of schwa deletion. This rule applied in an initial sequence of two syllables when both syllables were of the shape CV and when the second vowel was a schwa. The rule applied to delete the schwa and re-syllabify the onset of the second syllable to be a coda in the first syllable when the onset to the third syllable was part of some particular morphemes or in some particular positions. Leer states that in the Alutiiq language this is limited to the word-initial foot. When the schwa was present in the second syllable, it was in the position to be stressed; the synchronic residue of this is that what was an initial bi-moraic sequence “CVCe” is still treated as bi-moraic even though it is now CVC. Furthermore, initial CVC syllables which were not historically derived by deleting a schwa from the second syllable are also treated as heavy in the synchronic grammar. It is tempting to speculate that at some point native speakers could no longer distinguish which initial CVC syllables were a result of schwa deletion and which were not. One conceivable result of this situation would be the present situation, namely that all initial CVC syllables are treated in the same way, i.e., they all pattern with bi-moraic syllables. However, as Tony Woodbury (p.c.) reminds me, the treatment of initial CVC syllables as heavy is one of the developments from Central Siberian Yupik to dialects such as Norton Sound CAY, even though Norton Sound CAY lacks the schwa deletion rule. The explanation suggested by the reanalysis of any initial CVC syllable as one which is diachronically derived from a C–V–C–schwa sequence would only be available in those dialects which show schwa deletion. However, these dialects are a subset of those in which initial CVC syllables are heavy.
(3) Chugach data containing heavy syllables

a  taá.ta.qá  ‘my father’
b  taá.taá  ‘her father’
c  mu.lúk.'uút  ‘milks’ (pl. of N)
d  naá.'uq  ‘it’s burning’
e  naá.qu.ma.lú.ku  ‘apparently reading it’
f  mu.lú.kuút  ‘if you take a long time’
g  pa.lát.kaáq  ‘tent’
h  pi.lú.liá.qa  ‘the fish pie I’m making’
i  úl.'uq  ‘it flooded’
j  úl.luá  ‘its tongue’
k  án.ci.quá  ‘I’ll go out’
l  án.ci.qu.kút  ‘we’ll go out’
m  íq.lu.nír.túq  ‘he stopped lying’
n  qáy.yaá.kun  ‘by his boat’
o  úm.yuár.te.qu.té.ká.qá  ‘I am thinking about it’
p  naá.ma.cf.quá  ‘I will suffice’
q  ág.ku.tár.tuá.nga  ‘I’m going to go’
r  ág.nguá.qu.tár.tuá.nga  ‘I’m going to dance’

These data all illustrate some modification of the iterating weak–strong–weak pattern discussed in §2.1.1. For example, in the tri-syllabic word in (3a), a simple iterating pattern would result in stress only on the second syllable; in (3c), stress is
on the second syllable but also on the third. Stress in (3h) is on the second and third syllables, but not on the fourth. These deviations from the basic pattern of weak – strong – weak iteration are the result of a requirement that heavy syllables be stressed.

The words in (3i-o) also illustrate interruptions which can be understood in the same way when the initial closed syllables in these words are analyzed as being heavy.\(^7\)

The data of Chugach have been presented in two groups, based on the nature of the syllables in the words. The first group, in (2), consists of words in which there are no heavy syllables and the second, in (3), consists of words in which heavy syllables do appear. There is a third group in which some syllables have voiceless vowels. These patterns will be discussed after an analysis for the first two groups has been developed.

The analysis of the distribution of stress in Chugach will be one which involves the iterative construction of metrical constituents across the word. Metrical constituents have two constructs: boundaries and heads. The empirical manifestation of heads is stress. Empirical evidence for the edges of feet is frequently less overt and their appropriateness in metrical theory has been challenged, e.g., in Prince (1983). Since Chugach provides empirical evidence for the edges of constituents, I present this evidence to motivate the positing of boundaries as well as heads in the metrical system of the language.

\(^7\) The initial syllables in (3j) and (3n) are heavy due to a rule which geminates the initial consonant of a heavy second syllable when the initial syllable is light and open. I will return to a discussion of this process below.
2.2 Fortition as a foot boundary sensitive process

In this section, I discuss the phonological process of fortition in Chugach and claim that a statement of the environment in which this process occurs refers to metrical structure.

Fortition is a lengthening process. It does not change single consonants into geminates. That is, the lengthening is not sufficient to close a preceding syllable. Leer (p. 84) describes fortition as "a kind of preclosure (but not gemination) of" a consonant. Evidence for this claim comes from the phonotactic constraints of the language. No clusters of three consonants are allowed in Chugach. Hence, Leer (p. 86) claims that "a fortis consonant must be considered to belong to the syllable [which is] headed by the fortis consonant ... since fortis consonants can occur following closed syllables and three-consonant clusters are not allowed." Because fortition is not lengthening to the point of gemination, the onset to one syllable may undergo fortition even if the previous syllable is closed. That is, in the sequence CVC.CVC, the underlined consonant may undergo fortition.

In (4), the fortis consonants are indicated by underscoring. Periods indicate syllable boundaries.

(4) Fortis consonants

\[ \text{mu.lúk.'uút} \quad \text{pa.lá.yaq} \]
\[ \text{áñ.cí.quá} \quad \text{qə.ná.wik} \]
The distribution of the fortis consonants can be described relative to the location of stress. In heavy syllables, which are always stressed, the syllable onset undergoes fortition. Hence, the [q] in [ánciquá] is predictably fortis since it is the onset to a heavy syllable. The location of fortition when it is not the onset to a heavy syllable is also predictable. Specifically, the onset to an unstressed light syllable which precedes a stressed light syllable undergoes fortition. The [I] in [taqúmaluní] is an example of a fortis consonant in that environment.

Although the description given in the previous paragraph is adequate to locate fortis consonants, it is unsatisfying to the extent that a generalization collapsing the two statements into one is apparently being missed. Leer notes that fortis consonants sound like word initial consonants and, based on this observation, he proposes that fortition marks junctures within the word. Hence, the locations noted above must be a juncture. This juncture, following Leer's proposal, will be shown below to be the edge of a metrical foot.

The distribution of metrical constituents to be argued for below is such that the distribution of fortis consonants can be described with the rule in (5), in which the bracket indicates a foot edge.

(5) Fortition

\[
C \rightarrow [+fortis] / \left[ F \right]
\]
The purpose of discussing fortition at this point is not to argue that fortis consonants coincide with the edges of feet. Rather, the goal is simply to note that there is a process which can be construed as a phonetic implementation of those edges. The existence of such a process justifies proceeding with an analysis in which foot boundaries are constructed, so a bracketed grid notation is used for Chugach. Although it is possible to describe the distribution of fortis consonants without reference to the foot, the co-occurrence of fortis consonants with the beginning of a foot, as formalized in (5), facilitates the explanation that fortis consonants serve the function of indicating foot junctures in Chugach.

2.3 Analysis of primary stress

In this section, an analysis of the data in (2) and (3) is proposed. That is, an algorithm which will correctly locate stress in this language is proposed. As noted above, the basic approach to identifying the location of stress in Chugach will be the construction ofmetrical constituents, which is justified since there are phonetic manifestations of both edges (fortition) and heads (stress).

The data in (2) have a stress pattern which was described as iterations of a weak–strong–weak pattern. In Rice (1988, 1990), I argued for an analysis which iteratively constructs constituents having three elements of which the center element is the head. A ternary constituent with the prominence on the middle element is known as an “amphibrach” and would appear as in (6) in H&V notation. Each asterisk on line zero represents a mora. The parentheses on line zero indicate that
the three asterisks are grouped into a constituent. The asterisk on line 1 indicates that the middle element of the line zero ternary grouping is most prominent, i.e., it indicates that the middle element is the head and that it is the position which will be stressed.

(6) H&V notation for an amphibrach

\[
\begin{align*}
\text{line 1} & \quad \ast \\
\text{line 0} & \quad (\ast \ast \ast )
\end{align*}
\]

The amphibrach analysis of Chugach has been challenged in other work, which will be discussed in chapter four; one motivation which these challenges have in common is the conviction that metrical constituents should be maximally binary. Although the amphibrach analysis can account for the distribution of stress in Chugach, there is one particular stress pattern for which it requires an ad hoc rule of metrical readjustment. This pattern is HLLH, and it is discussed below.

The analysis of Chugach presented here deviates from my earlier proposals (Rice 1988, 1989, 1990) by abandoning the amphibrach as the relevant constituent. Not only does the present analysis provide motivation for the afore-mentioned ad hoc readjustment rule, it treats the system as one which is indeed fundamentally binary. The constituent which Chugach employs is the trochee, i.e., a left-headed foot, which is represented after the proposal in chapter one as (H N). This template is mapped as uneven, strong, non-tautosyllabic, such that the head must
be bi-moraic and the non-head must be mono-moraic. This approach is partially motivated by realizing the importance of one point which all analyses of Chugach share. In all analyses of Chugach (Leer (1985, 1989), Rice (1988, 1989, 1990), Hayes (1991), Hammond (1990), Hewitt (1991), Halle (1990)), a sequence of a heavy syllable followed by a light syllable is a constituent. As I will show below, there are cues for this grouping from stress, fortition and pitch facts. I take this constituent to represent the basic foot in Chugach: a bi-moraic head followed by a mono-moraic non-head. As noted, this will be a left headed constituent, mapped as uneven, strong, and non-tautosyllabic.

I begin my demonstration of the stress assignment procedure in Chugach with the statement for constructing feet in (7). Some slight modifications of this will be motivated below.

(7) Chugach Foot Construction (preliminary version)

   a) Template: (H N)
   b) Direction: Left to Right
   c) Mapping: Uneven: Strong: Non-tautosyllabic

Before turning to illustrations, I briefly discuss the proposals for treating quantity sensitivity from the literature to focus on one point of crucial relevance.

Three kinds of quantity sensitive constituents have been proposed, two in Hayes (1980) (citing unpublished work by Halle and Vergnaud (1978)) and the

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8 Kager's (1991) analysis constructs a foot over the heavy syllable and skips the subsequent light syllable. It is not clear whether he considers this grouping to be a constituent.
third in Hammond (1986). In the foot which is called simply the Quantity Sensitive foot, a heavy syllable cannot be the non‐head of a constituent, although the heads can be either light or heavy. An attempt to use QS feet for Chugach would employ QS amphibrachs, since binary feet are clearly not adequate based on the data in (2) and (3). In (9), QS amphibrachs do not correctly predict the location of stress. The illustrations are explicated below.

\[(9a) \quad (x \ . \ . \ . \ . \ . ) \quad (9b) \quad (x) \quad (x \ . \ . \ . \ . \ . )
\]
\[
\mu\mu \mu \mu \mu \mu \mu \mu \mu \mu \mu \mu \mu \mu \mu
\]
\[
\acute{\text{g}} \ \text{ku} \ \text{tár} \ \text{tuá} \ \text{nga}
\]
\[
\acute{\text{g}}.\text{nuá.qu.tár.tuá.nga}
\]

In (9a), the first syllable is heavy so it cannot be a non‐head. It is made the head of a constituent and can have one syllable after it before the constituent boundary. The remaining three syllables form one complete amphibrach. Neither of the non‐heads dominates a heavy syllable, so the amphibrach is a well‐formed QS foot. In (9b), the first and second syllables are both heavy, hence they must both be heads. The second syllable forms a foot with the light third syllable and then a complete amphibrach is constructed over the remaining three syllables.

The problem with this procedure for deriving stress on the two forms above is that it fails to locate stress on the third syllable in the (9a) and on the fourth syllable in the (9b). Therefore, this approach is inadequate and need not be pursued further.

The QS foot just examined has a restriction on its non‐head such that the non‐head cannot dominate a heavy syllable. Hammond (1986) proposes a foot
type in which there is a restriction only on the head. These feet are called "revised obligatory branching" (ROB) feet and have the special characteristic that the head must dominate a heavy syllable. The non-head can dominate either a light syllable or a heavy syllable. ROB amphibrachs are clearly inadequate for Chugach. In a foot with only light syllables, ROB feet predict the complete absence of stress since there are no heavy syllables to be the heads of feet. Furthermore, there can be adjacent heavy syllables which both have stress, cf. (3b, 3o, 3r), a situation which ROB feet predict should not exist.

The third kind of quantity sensitive foot is called the "obligatory branching" (OB) foot, which has restrictions on both its head and its non-head. The head of an OB foot must dominate a heavy syllable and the non-head must dominate a light syllable. The template and mapping which were proposed for Old English in chapter two and which is now proposed for Chugach borrows its shape from the OB foot. It is the manner of construction which differs.

In fact, an analysis using the traditional OB foot is possible. Left-headed OB feet would be constructed across the word. This process would only place feet where there are heavy syllables. Then, the remainder of the word would be footed with quantity sensitive amphibrachs. Rather than pursue this approach which uses two kinds of feet, I acknowledge the fundamental similarity between OB feet and QI amphibrachs: they are feet which are tri-moraic. In fact, I take the data in (2) as revealing this fundamental fact of the Chugach foot, i.e., that it is tri-moraic. Rather than continue discussing inadequate theoretical tools, I turn now to a demonstration of the footing procedure proposed in (7).
Consider the metrical structure of the word in (10). The first two moras, which happen to coincide with the first syllable, are the head of the first foot. The second syllable is mono–moraic and becomes the non–head of this foot. The next two moras are the head of the second foot, without regard to the fact that they are in different syllables, and the final syllable is the non–head of the second foot. This generates two full feet with bi–moraic heads and mono–moraic non–heads. The bold–faced consonants are fortis, demonstrating that this analysis correctly predicts the appearance of fortition at the onset to a foot.  

\begin{align*}
(10) & \quad (x \ .) \ (x \ .) \\
& \quad [\mu \mu] \ \mu \ [\mu \ \mu] \ \mu \\
& \quad n a a q u \ m a l u k u
\end{align*}

In (11), the first two moras become the head of a foot. However, it is not possible to “complete” the foot without violating the integrity of the third syllable, so the first foot is degenerate. The remaining three moras form a full foot.

\begin{align*}
(11) & \quad (x) \ (x \ .) \\
& \quad [\mu \ \mu] \ [\mu \mu] \ \mu \\
& \quad p i l u \ l i a q a
\end{align*}

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9 In Chugach, like Cayuva but unlike Old English, stress appears on the rightmost of the two moras in the head. The two moras which constitute the head are given within square brackets.
In words which consist of strings of light syllables, the footing will appear as in (12). In these cases, the first two moras happen to coincide with the first two syllables and the third syllable will be the non–head. The iterative construction of these constituents correctly predicts the location of stress and fortition.

(12a) \((x, .)\)
\([\mu \, \mu] \, \mu\)
\(pa \, \text{lä} \, \text{yaq}\)

(12b) \((x, .)\)
\([\mu \, \mu] \, \mu\)
\(qe \, \text{ná} \, \text{wik}\)

(12c) \((x, .) \quad (x, .)\)
\([\mu \, \mu] \, \mu \quad [\mu \, \mu] \, \mu\)
\(sa \, \text{rá} \, \text{ní} \, \text{wa} \, \text{kár} \, \text{tuq}\)

(12d) \((x, .) \quad (x)\)
\([\mu \, \mu] \, \mu \quad [\mu \, \mu]\)
\(ta \, \text{qú} \, \text{ma} \, \text{lu} \, \text{ní}\)

The foot assignment procedure in (7) is also able to account for those words which the "QS amphibranch" analysis could not, which were presented in (9). (Recall that word–initial closed syllables are bi–moraic. Although the head is
represented as dominating the second mora of the head, the stress is actually implemented on the vowel since consonants are not potentially stress bearing.) The analysis of these words based on (7) is given in (13)

(13a) \((x._.) (x) (x._.)\) (13b) \((x) (x._.) (x) (x._.)\)
\([\mu \mu] \mu [\mu] [\mu \mu] \mu\) \([\mu \mu] [\mu \mu] \mu [\mu] [\mu \mu] \mu\)
á g k u t á r t u á n g a á g n g u á q u t á r t u á n g a

The representations in (13) give the structure which follows from applying the rules in (7). In both words the initial syllable is closed and therefore bi-moraic. Hence, the initial syllable coincides with the head of the first foot. In (13a) the foot can be completed with a mono-moraic non-head; however, in (13b), the second syllable is also bi-moraic; using one of its moras to complete the first foot would lead to a violation of syllable integrity. The first foot in (13b) is therefore degenerate. Subsequent to this initial degenerate foot in (13b), a full foot can be constructed. The second foot in (13a) and the third foot in (13b) both begin with the mono-moraic syllable [tar]. In both cases, the subsequent syllable is bi-moraic and syllable integrity would be violated if one of the moras of that syllable were used to complete the head (cf. (8b)), hence in both cases [tar] becomes a degenerate syllable. A full foot is constructed over the final two syllables in both (13a) and (13b).

The structures in (13) are problematic because they do not heed rule (7c), insofar as they both contain a foot which lacks sufficient material to form a head, i.e., they both contain a foot consisting solely of the mono-moraic syllable [tar].
As stated in (7c), a degenerate foot consists of a head without a non-head; in Chugach a head obligatorily has two moras.

The phonology of Chugach displays two strategies for redressing the construction of a mono-moraic foot. The cases in (13) illustrate one of these. In order to have two moras in the head, a second mora must be added to the [\text{tar}] feet. The subsequent moras are not candidates, since this would lead to a violation of syllable integrity. Hence, a mora is taken from the previous foot and made to be part of the foot with [\text{tar}]. This foot is now bi-moraic and therefore sufficient to be the head of a degenerate foot. This metrical restructuring process leads to the structures for these words given in (14). With this modification, the location of the fortis consonants again coincides with the onset of each foot.

(14a) \begin{align*}
(\text{x}) & \quad (\text{x}) & \quad (\text{x}) \quad . \\
[\mu \mu] & [\mu] & [\mu \mu] & \mu
\end{align*}
\begin{align*}
\text{ág k} & \quad \text{u} & \quad \text{tár} & \quad \text{tuánga}
\end{align*}
(14b) \begin{align*}
(\text{x}) & \quad (\text{x}) & \quad (\text{x}) & \quad (\text{x}) \quad . \\
[\mu \mu] & [\mu \mu] & [\mu] & [\mu] & [\mu \mu] & \mu
\end{align*}
\begin{align*}
\text{ág n} & \quad \text{ngu} & \quad \text{á qu} & \quad \text{tár} & \quad \text{tuánga}
\end{align*}

In previous work (Rice (1988, 1990), Halle (1990)), it is simply stated that mono-moraic feet are not tolerated and metrical restructuring applies. Here, this is motivated by central characteristics of the foot and the restructuring is clearly not ad hoc. Rather, it is motivated by the realization that all feet, both full and degenerate ones, must have a head.

In another situation, Chugach utilizes a segmental process when a mono-moraic foot has been constructed. This segmental process will lead the mono-moraic foot to be bi-moraic and therefore a well-formed degenerate foot. When
the initial syllable of a word is a CV syllable and the second syllable of the word is heavy, the initial syllable will be a mono–moraic foot. Stress patterns of the surface forms are in (15a = 3j) and (15b = 3n).

15a  ú.lua  ‘its tongue’
15b  qáy.yaa.kun  ‘by his boat’

These surface forms are underlyingly /u.lua/ and /qa.yaa.kun/. The metrical structure for the underlying forms are given in (16).

(16a)  
(x)  (x)
[µ]  [µµ]
u  l u a

(16b)  
(x)  (x  .)
[µ]  [µµ]  µ
q a  y a a k u n

In both of these words, the initial syllable is light and the second syllable is heavy. The result is that a bi–moraic head for the first foot cannot be constructed without violating the syllable integrity of the second syllable. Non–heads in Chugach are mono–moraic, so the second syllable cannot be the non–head of the first foot. Hence, the initial foot is mono–moraic foot, which is not allowed to surface. As in (14), it is not possible to augment this foot by taking a mora from the subsequent syllable. Unlike (14), however, there is no preceding foot from which to take a mora. The phonology of the language responds to this situation by geminating the onset consonant of the second syllable. By doubling this consonant, the first syllable will be closed; it has already been demonstrated that
initial closed syllables are bi-moraic. Hence, this gemination process applies to provide the degenerate foot with sufficient moraic material to be a head. The surface metrical structures are as in (17).

(17a)  
\[(x) \quad (x)\]  
\[[\mu] \quad [\mu\mu]\]  
\[ul \quad u\]  

(17b)  
\[(x) \quad (x \quad .)\]  
\[[\mu] \quad [\mu\mu] \quad \mu\]  
\[qay \quad yaa \quad kun\]

The metrical restructuring rule and the gemination of the onset to a heavy second syllable when the first syllable is light are now understood as being two processes which serve the same function. Both operate to augment a mono-moraic foot. Having one mora is not enough even to be a degenerate foot, since a degenerate foot must have a head and two moras are required for a head.10

10 The lengthening process like the one manifested in (17) is wide-spread in the Yupik languages. Woodbury (1987) identifies the process of "syllable-bulking" in Central Alaskan Yupik, which has essentially the same function. There are two cases in which the syllable is closed with the geminate of the onset to the following syllable: when the vowel is schwa or when the syllable is word initial. Woodbury formalizes this rule as in (18).

(18)  
Syllable Bulking  
\[\sigma\]  
\[\text{Insert X / CV}\]

Rule (18) must be explicitly restricted so that the features for the inserted X-slot are filled by spreading from the left, unless that vowel is schwa or if the syllable is word initial. The word-initial stipulation seems to be related to the fact that a (C)VVC syllable is heavy when it is word initial; so, the effect of syllable bulking is to render a stressed light syllable as heavy.
2.4 Voiceless vowels

The final issue to address regarding the assignment of primary stress involves further clarification of the phrase "potential stress bearing element." To this point, each mora has been treated as potentially stress bearing, except for a consonant which closes an initial syllable. However, there is one further type of mora which resists bearing stress. The following consideration of syllables containing voiceless vowels concludes the discussion of primary stress. First, the conditions under which these vowels appear are described and then their interaction with stress assignment is analyzed.

2.4.1 Devoicing rules

Voiceless vowels are described (Leer 1985, p. 106) as "phonologically present but either phonetically indeterminate or not realized as a distinctly audible vowel." Leer claims that the placement of stress is sometimes affected by these vowels, and they therefore require discussion.

Rules to describe the distribution and origin of the voiceless schwa are, in Leer's (1985: 101) words, "ubiquitous ... and often difficult to describe because of the amount of variation found." This difficulty is compounded with regard to the dialect under consideration here since the process is more common in Koniaq Alutiiq. Keeping his disclaimer in mind, we present the rules which Leer has suggested. The first case where voiceless schwa occurs is as an epenthetic vowel between the second and third consonants in the string VCCCV. There is a further
restriction in this case whereby the second consonant must be a stop and the third must be "a continuant which is devoiced by the preceding stop" (p. 103). The two examples in (19) illustrate this process.

(19)

\[ \text{[míŋ, qə, tə, kú]} \quad \text{'sewing it'} \]
\[ \text{[píúx, tə, mán]} \quad \text{'to the dog'} \]

The lateral fricative in the first word and the nasal in the second word are devoiced by the preceding segments, which leads to the insertion of the voiceless schwa.\(^{11}\) The stress assigning algorithm developed above does not need to be modified to predict the location of stress in these two examples. That is, stress would appear in the same place if the vowels in the second syllables were voiced.

The second situation in which a voiceless schwa can occur is by devoicing an underlyingly present schwa before a voiceless consonant. Leer suggests three rules which address various instantiations of this generalization. The first one devoices schwa between a stop and a voiceless consonant "where either of these consonants are homorganic [with the following consonant – CR] or one is a velar and the other a uvular" (p.104). The second rule devoices schwa between a stop and a voiceless consonant, and explicitly states that the voiceless consonant must

\(^{11}\) Extrapolating from these examples, it seems that the nasals pattern with the [+continuant] in Alutiiq. In Leer (1985) there are no comments about this. Kaplan's (1981) work on Inuit also treats nasals as [+continuant]. Woodbury (1981) discusses processes in Central Alaskan Yupik, some of which treat nasals as [+continuant], but some of which treat them as the standard [-continuant]. Miller (1991) reanalyzes Kaplan's work such that the nasals are [-continuant]. The feature specification of the nasals in both Yupik and Inuit remains as a topic requiring further investigation.
be an onset. The third rule devoices schwa again between a stop and a voiceless consonant, but in this case the schwa is specified as "base-final" so the voiceless consonant begins a suffix. This rule is obligatory if the suffix onset is a stop, but is optional if the onset is a fricative. The examples in (20) illustrate these cases.

(20)

a  [mfn.qɔx.kɔx.kɔ]  'I sewed it'
b  [pɔ.ɾút]  'leaves'
c  [pɔ.ɾɑq]  'cliff'
d  [pfn.qɔx.tɔ.ɔx.piɔx.tuq]  'there is hardly any'
e  [tə.kf.i.tɔ.ku.tɔx.tuq]  'she is going to arrive'
f.1 [tə.kf.tɔx.ku.ná:i.ku]  'without reaching it'
f.2 [tə.kf.tɔx.ku.ná:i.ku]  'without reaching it'

In (20a), the second schwa is apparently devoiced by the homorganic constraint, since the [x] is homorganic with [k], while the first one could either be by the homorganic constraint or by the velar-uvular rule. In (20b), the second devoicing rule applies since the lateral is an onset. The second rule is also illustrated by (20c), again assuming that nasals are continuants. In (20d), it is not clear why the first schwa is voiceless, unless the homorganic constraint is met by the uvular stop which precedes the vowel; the second voiceless schwa is due to the second rule, since it appears before a voiceless onset. The third rule is illustrated
with (20e), where the schwa is the last segment of the base. Finally, the examples in (20f) show the optionality of devoicing a base-final schwa before a fricative.\textsuperscript{12}

2.4.2 Stress assignment

Having illustrated the circumstances under which voiceless schwa can appear, I turn to the relevance of this issue for stress assignment. An examination of the patterns in (20) reveals that none of the stress patterns on these forms are affected by the voiceless vowels, i.e., the stress patterns of all of these words would be the same if the position of the voiceless vowel were occupied by a voiced vowel (cf. 20f.1 and 20f.2). A search of Leer (1985a,b,c) turns up only two forms in Chugach in which the stress patterns are affected by the presence of a voiceless vowel. These two examples are given in (21).\textsuperscript{13}

21a \quad [u.əu, 'a.na.kʂ̂.ku.na.ku] \quad 'not finding it cold'

21b \quad [əp.ru.tɔm.tʂ.ŋi] \quad 'in our road'

The footing of these strings is entirely straightforward when the voiceless schwa is realized to be on the one hand sufficiently sonorous to head a syllable, but on the other hand inadequate to head a foot. That is, there is an actual syllable headed by this vowel and it must be part of a foot. However, this mora is not potentially stress-bearing. When the voiceless schwa is the second mora of the

\textsuperscript{12} The vowel length in (e) and (f) follows stress assignment, i.e. it is syllable bulking.

\textsuperscript{13} The form in (21a) appears in Leer (1985b: 155) and that in (20b) appears in Leer (1985c: 169).
head, the line one asterisk which is projected from it shifts to the other mora of the head. This provides confirmation for the bracketing structure of the heads within the foot; by bracketing the heads as a sub-foot constituent, the location to which the asterisk must be shifted can be predicted: it will shift to the only available site within this constituent. Hence, in (21a), stress shifts from the fifth syllable to the fourth. This shift off of a mora dominating a voiceless vowel is parallel to the shift of stress off of the moraic coda consonant of an initial (C)VC syllable and is implemented on the first mora, i.e., the vowel, cf. the discussion of initial closed syllables above.

To correctly derive the location of the stresses which follow the voiceless vowel, a new foot must begin after the voiceless vowel. This follows the pattern elsewhere in the language in which the the syllable immediately following the stressed mora is the last element of the foot. Since the stress has shifted leftward off of the voiceless vowel, the syllable with the voiceless vowel is now post-tonic and hence the final syllable of that foot. A new foot begins in (21a) with the syllable [ku] and in (21b) with [ni].

A limitation on the extent of metrical restructuring is revealed by the form in (21b). The consonants which are fortis can be determined by extrapolating from Leer's stress assigning rules; in this word, both of the [t] onsets are fortis.14 When the final syllable is footed, as in (22a), there is insufficient moraic material to

---

14 This inference about the location of fortition follows not only from the explicit illustration of the foot structure for this word in Leer (1985c: 169), but also from the "three syllable rule," to be presented in §3.2 below. That rule operates on a string of three non-initial light syllables and would target the second, third and fourth syllables of (21b). When the vowel of the third syllable is voiceless, as it is in (21b), then this rule constructs a mono-syllabic foot on the second syllable in the string and makes the first syllable in the string part of a super-foot with the preceding foot. Hence, the third syllable will be the first (and only) syllable in the second foot of the word and the onset to this syllable/foot will be fortis.
constitute a head; this is represented with the absence of the "closing" square bracket and a line one asterisk. Metrical restructuring ensues such that the fourth syllable becomes part of the head of the final foot, as seen above in connection with (13). However, the effect of doing this is to leave the second foot as a monomoraic one, as in (22b). In this case, no restructuring occurs, suggesting that there is no rescanning of the word to look for derived violations of the bi-moraic requirement on heads.

(22a)

\[
\begin{align*}
(x & .) \quad (x) \quad (x) \\
[\mu \mu] & \mu \quad [\mu \mu] \quad [\mu] \\
\text{á} & \text{p} \quad \text{r} \quad \text{u} \quad \text{t} \quad \text{ám} \quad \text{t} \quad \text{ə} \quad \text{n} \quad \text{f} \\
\end{align*}
\]

(22b)

\[
\begin{align*}
(x & .) \quad (x) \quad (x) \\
[\mu \mu] & \mu \quad [\mu] \quad [\mu \mu] \\
\text{á} & \text{p} \quad \text{r} \quad \text{u} \quad \text{t} \quad \text{ám} \quad \text{t} \quad \text{ə} \quad \text{n} \quad \text{f} \\
\end{align*}
\]

In addition to the three studies published as Leer (1985a,b,c) which have been extensively referred to above, a recent manuscript provides additional data from Chugach. Leer (1989) states that the two purposes of this manuscript are to consider further data which cast doubt on the amphibrach solution advocated in Rice (1988) and Halle (1990) and to discuss some issues raised in H&V.

The data which are presented by Leer as problematic for the amphibrach analysis are more patterns containing voiceless schwases. Although the analysis argued for in this chapter does not utilize amphibrachs, the present analysis must
also be evaluated against these recently introduced data. I will demonstrate here
that these forms actually pose no difficulty for the analysis given above. The
essence of the solution is Leer’s observation that the general nature of the
interaction of the stress rules with syllables which have voiceless schwa reveals a
tendency to avoid stressing these segments. As suggested in the discussion of (21)
and (22), the solution follows from the realization that voiceless vowels are
avoided as stress bearing units in Chugach, with one exception to be discussed
below. The relevant data presented in Leer (1989) are in (23).

(23)
nen
a [méq.sux.pa.kán.'ʒŋi.lú.ní] ‘saying that s/he is not too thirsty’
b [pi.túx.pa.kán.'ʒŋi.lú.ní] ‘saying s/he is not eating too much’
c [mák.'ay.wf.kax.kwán.'zh.ks.ñá] ‘don’t let a bear rise suddenly on you’
d [pi.tús.pa.kán.'ʒŋi.láy.yu.kax.kém.ken]
   ‘I thought that you always say that you don’t eat too much’

e [ka.kax.țux.lu.kú] ‘having a runny nose’
f [i.qúk.ți.tų.'yaá] ‘it came to an end’
g [ki.tú.'ay.cs.tą.țá.qa] ‘the one I let zip by me’

Considering each of these words in turn, I propose the following analyses.
For (23a), nothing special needs to be said; the standard footing procedure
correctly predicts the location of stress. This is illustrated in (24a).
(24a)

\[
\begin{array}{cccc}
  (x \phantom{.}) & (x \phantom{.}) & (x \phantom{.}) \\
  [\mu \mu] & \mu & [\mu \mu] & [\mu \mu] \\
  m \; \text{é} \; q \; s \; u \; x \; p \; a \; k \; â \; n \; n \; ñ \; ñ \; i \; l \; û \; n \; i
\end{array}
\]

(23b) is illustrated in (24b). When the head of the second foot is built, the voiceless schwa is in the rightmost position of the head; since the voiceless vowel cannot bear a line one asterisk, that asterisk shifts to the other mora of the head, which in this case is the fourth syllable of the word. Because the syllable with the voiceless vowel ends the foot since it is the post-tonic syllable, the final three syllables of the word constitute a full foot.

(24b)

\[
\begin{array}{cccc}
  (x \phantom{.}) & (x \phantom{.}) & (x \phantom{.}) \\
  [\mu \mu] & \mu & [\mu \mu] & [\mu \mu] \\
  p \; i \; t \; û \; û \; y \; p \; a \; k \; â \; n \; n \; ñ \; ñ \; i \; l \; û \; n \; i
\end{array}
\]

In (23/4c), the retraction procedure from (24b) is used twice, shifting heads from the fourth syllable to the third and from the sixth syllable to the fifth.\(^{15}\)

\[^{15}\text{The similarity between the coda consonant of an initial syllable and a voiceless schwa can be seen in (24c). Both appear as the right mora of the head and in both cases the stress is associated with the left mora of the head. However, alongside this similarity, there is a difference between the voiceless schwas and initial syllable codas. As will be demonstrated below, in some circumstances a voiceless schwa may be stressed, whereas the coda to the initial syllable is never stressed.}\]
(24c)

\[
\begin{array}{cccc}
(x) & . & (x) & (x) \\
[\mu \mu] & \mu & [\mu \mu] & [\mu \mu] \\
\end{array}
\]

\[m\acute{a}k k\acute{a}γ \, \, w\acute{f} k\acute{a}x k\acute{w}\acute{a}n n\acute{\ddot{e}} \, k\acute{i}n\acute{a}\]

In (23d), illustrated in (24d), stress is shifted from the fifth to the fourth syllable as in the previous cases. The remainder of the word follows straightforwardly.

(24d)

\[
\begin{array}{cccc}
(x) & . & (x) & (x) \\
[\mu \mu] & \mu & [\mu \mu] & [\mu \mu] \\
\end{array}
\]

\[pi \, t\ddot{u}r \, pa \, k\ddot{a}n \, n\ddot{e} \, \, ni \, l\acute{a}y \, yu \, k\acute{a}x \, k\acute{e}m \, k\acute{e}n\]

The forms in (23e) and (23f), illustrated in (24e) and (24f), are interesting since they are cases in which the head is not shifted off of the voiceless vowel with the result that a voiceless schwa does get stressed. The generalization about these forms in Leer (1989) is that a stressed voiceless schwa is allowed “in Chugach in the first foot of the word and before heavy syllables.” In (23/4e), the schwa in the second syllable does not get deleted because the syllable is closed, i.e., because doing so would leave an unsyllabifiable string of three consonants. (Cf. the discussion in footnote 6.) The avoidance of having voiceless schwa as a foot head is overridden here, perhaps to avoid shifting stress onto an initial CV syllable.
Recall that there are rules which serve to prevent an initial CV syllable from being stressed; e.g., closing such a syllable with the geminated of a following heavy syllable or deleting the schwa in the second syllable and closing the first with the onset from the second. So, it would seem that the stress system of Chugach places a high value on having initial CV syllables be unstressed. As illustrated by (23/4e), this avoidance of stress on initial CV syllables is valued even more highly than avoiding stress on a voiceless schwa.\footnote{\(\text{(24e)}\) shows that when stress remains on the voiceless schwa, the foot does have a subsequent syllable, cf. the cases in (21) and (24 b, c, d).}

\[
\begin{align*}
(x) & \quad \cdot \\
[k \mu \mu] & \quad \mu & [\mu \mu] \\
\_ & \quad x & \_ & \quad u & \_ & \quad k & \_ \\
\end{align*}
\]

In (23/4f) a different perspective is needed, since it is not the initial foot which has the voiceless vowel as its head. In (24f.1), an initial full foot is built, which dominates the first three syllables; the second foot is mono–moraic since taking a mora from the final syllable would violate syllable integrity. There are two possible solutions to explain why stress does not retract off of this voiceless schwa. In the earlier cases, such as (24b) and (24c), the retraction was onto the first element of the head. This third syllable of (24f.1) is in a different foot. However, the restructuring which is required when a mono–moraic foot is built will actually take the third syllable of this form into the second foot to form a head with the syllable containing the voiceless vowel, as illustrated in (24f.2). Hence,
this explanation of the non–shifting of the head is available only with ad hoc
extrinsic ordering of stress retraction prior to metrical restructuring.

Stress is not retracted off of the voiceless schwa in (23/4f) because doing
so would create a clash; specifically, moving the stress from the fourth syllable to
the third would result in stress on two adjacent light syllables, which is disallowed
in this language.

(24f.1)
\[
(\times \quad . \quad \times \quad \times ) \\
[\mu \quad \mu] \quad \mu \quad [\mu] \quad [\mu \quad \mu] \\
i \quad q \quad u \quad k \quad i \quad t \quad \acute{s} \quad \acute{\epsilon} \quad \gamma \quad a \quad a
\]

(24f.2)
\[
(\times \quad \times \quad \times ) \\
[\mu \quad \mu] \quad [\mu \quad \mu] \quad [\mu \quad \mu] \\
i \quad q \quad u \quad k \quad i \quad t \quad \acute{s} \quad \acute{\epsilon} \quad \gamma \quad a \quad a
\]

Finally, (23/4g) is a case with two adjacent voiceless schwas and the result
is that the first one does not get footed. The first foot in (23/4g) is a full foot; when
the second one is under construction, the two moras in the head are both voiceless,
as seen in (24g.1). Since the language avoids assigning stress to voiceless
schwas, this is a situation in which the head of the foot has no stressable element.
I propose that foot construction is frustrated in this situation and that the first vowel
with the voiceless schwa is simply skipped, leaving the last three syllable to form a
foot, yielding the foot structure in (24g.2). This structure correctly reflects the fact
that the [t] onset to the fifth syllable is fortis (cf. Leer (1989), p. 13).
It is noteworthy that in these cases in (23/4) a strict locality can be maintained throughout the process of foot construction insofar as it is never necessary to look beyond the immediately adjacent syllables to determine the correct construction of the metrical constituents.

I conclude this discussion of primary stress with a full statement of the stress assignment algorithm which has been presented and motivated in the preceding sections.

(25) **Primary stress assignment in Chugach** (final version)

a) Template: (H N )

b) Direction: Left to Right

c) Mapping: Uneven, Strong, Non−tautosyllabic
d) The second mora of a head attracts stress; retract stress to the first mora if the second mora is either a consonant or a voiceless vowel. 
Suspend retraction if retraction derives clash.\textsuperscript{17}

e) Degenerate feet must have a non-head (cf. (7) in chapter one).

\textbf{2.5 Secondary stress}

The previous sections were devoted to the development of an analysis of the distribution of primary stress. A complete analysis of Chugach must also discuss secondary stress; this topic is the focus of the present section.

In standard metrical theory, secondary stresses are distinguished from primary stresses by positing a level of metrical structure above the foot. This second level of structure is the word level and it has feet as its terminal elements. The primary stress in a word will be on the syllable which is the head of the foot which is itself the head of the word tree. The heads of feet which are not the head of the word tree will have secondary stress. Examples of this were seen in chapters one and two.

Chugach words can have more than one instance of primary stress, so false predictions about the relative prominence of the stressed syllables would be made

\textsuperscript{17} Alternatively, to preserve strict locality, retract in the two specified cases. If retraction generates a clash, resolve the clash by advancing the second head. This examination of the distribution of primary stress reveals a hierarchy of “preferences” regarding the appearance of stress. Most highly valued is the avoidance of stress on an initial open syllable; next highly valued is the avoidance of stress on adjacent light syllables; third in the hierarchy is the avoidance of stress on voiceless vowels. These preferences can only be violated to preserve more highly valued ones, e.g., stress can appear on a voiceless vowel only to avoid have stress on adjacent light syllables.
by representations which give some constituent heads prominence over others, i.e.,
by projecting a word level. A different approach must be taken to locate secondary
stresses.

I propose that the distribution of pitch in Chugach be analyzed with the
tools of autosegmental phonology. The pitch markings will be introduced to the
representation after the assignment of primary stressed. The representations of the
words are completed by “linking” the pitches to the syllables where they appear.
The remaining goal in this section is to identify the correct linking procedure for
placing the pitches on the right syllables.

The description of secondary stress in Leer (1985) suggests that primary
stress and secondary stress are not merely different degrees of the same
phenomenon. In particular, secondary stress apparently consists of pitch alone.
As an example of the evidence for this claim, consider the following quote.

The description of stress and pitch given here is somewhat idealized. I
am not certain that there is any absolute difference in stress alone between
'weakly stressed' and 'unstressed' syllables in Chugach Alutiiq. Because stress
and pitch level are commonly covariant in non-tonal languages it is often
difficult, if not pointless, to try to dissociate stress from pitch level. Since
'weakly stressed' syllables in CA have the lowest pitch level, they appear
unstressed to the linguist-observer. Thus it is possible to argue that in CA we
have two degrees of stress and three pitch levels, and the 'weakly stressed'
syllables differ from 'unstressed' syllables not by stress, but in that the 'weakly
stressed' syllables are assigned [low] pitch, ... whereas the 'unstressed' syllables
are not assigned a pitch level of their own. Their pitch is dependent on the pitch of the neighboring syllables." (Leer 1985c: 164, n. 5, emphasis added)

In short, Leer says that possibly the only difference between syllables with "secondary" stress and those with no stress is in the pitch level. From this point on, then, I will be presenting an analysis of secondary stress, but I assume that it is indeed pitch, so that what needs to be accounted for is the distribution of pitch. Leer's (1985a: 92) description of the distribution of pitch is paraphrased in (26).

(26) Chugach pitch distribution

a) No pitch level is assigned to a non-word-initial unstressed light syllable which precedes a stressed light syllable,
b) low pitch is assigned to all other unstressed light syllables,
c) high pitch is assigned to a stressed syllable which is either word initial or which follows a syllable with either low pitch or super-high pitch, (there may be one intervening syllable with no pitch assigned),
d) super-high pitch is assigned to a stressed syllable which follows a stressed syllable with high pitch, (there may be one intervening syllable with no pitch assigned here also).

(26 a–c) can be illustrated with the word (27). Metrical constituency indicating stress is above the word; pitch is indicated below it. An "H" linked to a syllable indicates that the syllable has high pitch while an "L" indicates low pitch.
There are no heavy syllables in this word, so the metrical structure which is assigned is parallel to those in (12) above. This correctly places stress on the second and fifth syllables. (26a) affects only the fourth syllable here because it is the only non-word-initial light syllable right before a stressed light syllable. Following (26a), no pitch is assigned to this syllable. The first, third and sixth syllables are unstressed light syllables so, following (26b), low pitch is assigned to them. The stressed syllables both follow syllables with low pitch, although in the case of the second stressed syllable, i.e., the fifth syllable, there is one intervening syllable which has no pitch assigned. Statement (26d) will be illustrated below.

The location of the different pitches in Chugach can be predicted as follows. After metrical constituents are constructed, one bi-tonal pitch accent with the shaped $H^*+L$ is inserted for each instance of primary stress. The asterisk on the $H^*$ indicates that the H is linked to the syllables bearing primary stress.\footnote{As Mark Liberman (p.c.) has pointed out to me, this may be further evidence for the internal structure of the feet I have proposed, in which in which a head must have two moras. We could conceive of the pitch facts such that two moras are required to "support" a high pitch. This is represented by linking the high pitch to the head. The 'L' on the initial syllable in (27) is discussed below.}
L is linked to the subsequent syllable, follow a standard one-to-one, left-to-right auto-segmental linking procedure. This proposal correctly assigns pitch, given the following phonological procedures.

If an L tone cannot be linked, it must be erased. For example, if there are adjacent stressed syllables, each will have an H* associated to it. An L has been introduced with both instances of H*. However, there is no syllable available to link the first L to, hence it must be erased, as stated in (28a).

(28a) Low tone deletion

\[ L \rightarrow \emptyset \]

Read: A floating L is deleted.

The super-high pitch of statement (26d) is derived, not primitive. Its appearance can be predicted with the rule in (28b). This rule states that an H which follows another H becomes upstepped. The optional intervening syllable receives further consideration below. Up-stepping is triggered only by an H and not by an already up-stepped H. That is, in the terminology of Pierrehumbert and Beckman (1988), up-stepping does not “chain” in Chugach.

(28b)
The insertion of the proposed bi-tonal pitch accent, along with the floating-L deletion and the up-step rules predict the distribution of pitch in Chugach in nearly all cases. A derivation involving both of these rules would proceed as in (29). (29) has three stressed syllables with no intervening unstressed syllables. Three instances of $H^*+L$ are introduced and the Hs are linked to the stressed syllables. Since there are no syllables for the Ls to link to, (28a) applies to them. The environment for (28b) is met by the middle H, so its pitch is raised.

(29) Illustration of pitch accent rules

\[
\begin{align*}
\text{H}^*+L & \quad \text{Linking} & \quad \text{H}^*+L \\
\text{H}^*+L & \quad \text{Floating L} & \quad \text{H}^*+L \\
\text{H}^*+L & \quad \text{Deletion} & \quad \text{H}^*+L \\
\text{H}^*+L & \quad \text{Up-step} & \quad \text{H}^*+L \\
\end{align*}
\]

One remaining case which suggests a qualification of the pitch assigning procedure comes from considering the implications of the "optional syllable" in the upstepping rule. Up-step applies to an H following an H, even if there is an intervening syllable which bears no pitch. The only syllable which is not assigned pitch is an unstressed light syllable which appears before a stressed light syllable.

Two contrasting cases are represented in (30). (30a) has three syllables; the first syllable is bi-moraic and the second and third are mono-moraic. According to (26), there will be high pitch on the first syllable (statement (26c)), no pitch on the second syllable (statement (26a)) since it is an unstressed light syllable which
precedes a stressed light syllable, and super–high pitch on the third syllable (statement (26d)), since it is a stressed syllable which follows a syllable with high pitch. This case illustrates the optional syllable in the upstepping.

(30a) (30b)

\[
\begin{array}{cccc}
(x) & (x) & (x) & (x) \\
[\mu \mu] & [\mu] & [\mu] & [\mu \mu] \\
t & a & a & q & a \\
| & | & | & | \\
H & iH & H & L & H \\
\end{array}
\]

(30b) also has three syllables; the first and third syllables are bi–moraic and the second is mono–moraic. According to the distribution statement (26b), the second syllable should have low pitch, since it is an unstressed light which does not precede a stressed light syllable. The third syllable, since it is stressed and since it follows a syllable with low pitch will have high pitch, and not super–high pitch.

The problem which these contrasting cases illustrate becomes clear when the pitch assignment procedure is considered. The distribution of pitch on (30b) follows directly from the procedure already outlined. There are two primary stresses, so two instances of H*+L are inserted. The stressed syllables are each linked to an H*. The first L is linked to the second syllable and the second L is deleted since it has no docking site.

It would seem that pitch should be assigned in the same way to (30a). There are two primary stresses so, again, two instances of H*+L are inserted. However, the first L does not get linked to the second syllable. That is, the second
syllable has no pitch, rather than the low pitch which would follow from linking
the L to that syllable. The linking procedure as it stands incorrectly predicts low
pitch on the second syllable. We must determine why the L of the first pitch accent
does not link to the second syllable.

The solution to this problem lies the foot structures of the two forms. For
the first word, the foot building rules construct a mono-moraic foot on the final
syllable. Metrical re-structuring applies, making the second syllable part of the
second foot so that there is sufficient material to have a head in this degenerate foot.
No restructuring is needed in the second word. Hence, in (30a), the first two
syllables are not in the same metrical constituent, whereas in (30b), they are. The
contrast of the foot structures in (30a) and (30b) and the concurrent contrast in the
pitch facts suggests that the bi-tonal pitch accent must be linked within the same
metrical foot. Adding this claim, the distribution of pitch in (30) is fully accounted
for. The words in (30) are similar insofar as they have two stressed syllables and
two H*+L accents. They differ in that the first L of (30a) cannot be linked since
there is no target syllable within the foot. The erasure of this L creates the
environment for upstep, (28b), hence the raised pitch on the final syllable.

The explanation proposed for the contrast illustrated in (30) is available
only with the boundary locations derived as proposed in §2.3, including the
restructuring process related to the bi-moraic requirement on heads. The ability to
correctly predict the distribution of pitch constitutes further evidence for the
correctness of the metrical constituent structure building procedure which has been
proposed in this chapter.
I conclude by returning to the pitch facts illustrated in (27). The initial syllable of (27) has an L linked to it, indicating the low tone which statement (26b) suggests that they have. The proposed analysis does not predict this fact because an L is only inserted as part of an H*+L pitch accent, and there is no motivation to insert such an accent at the left edge of the word. As we will see in §3 below, Leer’s metrical analysis of the data also fails to predict this fact. In personal communication, Leer reports that the pitch on initial unstressed light syllables is actually an interpolation between the neighboring pitch values. The actual manifestation of pitch on the “no pitch” syllables is also an interpolation of the neighboring values. Hence, the failure of my analysis to assign low pitch to initial light syllables is in accordance with the facts of the language. No pitch should be assigned in these cases and (26b) should be modified to exclude word-initial syllables.

In summary, I follow Leer by claiming there are four levels of pitch: super-high, high, low, and no-pitch. Pitch is accounted for as follows. An H*+L accent is introduced for each stressed syllable and is linked one-to-one, left-to-right, with the constraint that the accent must be exhaustively linked within one metrical foot. Unlinked Ls are erased, an H triggers the up-step of a subsequent H.

3.0 A previous analysis of stress in Chugach

In this section, I present the stress assigning procedure argued for in Leer (1985a,b,c). I discuss the application of the proposed rules and offer a critique of
this approach. This section is included not only to acknowledge the significant
collection which Leer has made, but also because the analysis is an object of
current discussion elsewhere in the literature, e.g., Halle (1990) and Woodbury

3.1 The rules and their applications

The structure building rules in Leer (1985c) construct feet, superfeet and pitch
groups. These rules interact to account for the distribution of both primary and
secondary stress. At all three levels, there are rules constructing both tree-
structures and a corresponding grid, similar to the metrical theories of Liberman
(1975) and Liberman and Prince (1977). The following statement of these rules
comes from Leer (1985c).

A. Foot definition rules

1. Word-initial monosyllabic foot rule. If the first syllable in the word is
light, then examine the first two syllables in the word (S1S2). In the
following ordered cases, define S1 as a monosyllabic foot:

(a) where S1 is closed

(b) where S2 is heavy: close S1 with the geminate of the following
consonant, so that S1 is (C)VC and S2 is :VV(C).

(c) S2 is Ce: delete e and redefine S1 as (C)VC.

Otherwise form an iambic foot on S1S2.
2. **Heavy foot rule.** Define each heavy syllable as a monosyllabic foot.

3. **Three syllable rule.** Working from left to right, operating on non-initial sequences of three light syllables ($S_1S_2S_3$), where there is no enclitic boundary between $S_2$ and $S_3$:
   
   (a) define $S_2S_3$ as an iambic foot unless $S_3$ is voiceless.
   
   (b) define $S_2$ as a monosyllabic foot where $S_3$ is voiceless, and resume left-to-right scanning following $S_2$ (i.e., beginning with the voiceless syllable).

4. **Two syllable rule.** Define each remaining pair of unassigned (light) syllables ($S_1S_2$) as an iambic foot.

On the metrical grid, asterisk strong nodes.

**B. Superfoot formation rule**

Form a left-headed superfoot on each foot plus an unassigned (light) syllable, if any, immediately following the foot.

On the metrical grid, asterisk the voiced node(s) of each superfoot (both strong and weak nodes).

**C. Pitch group formation rule**

From left to right, operating on pairs of superfeet (SF1SF2), form right-headed pitch group on each pair if SF1 is identical with the foot it
dominates (i.e. where there is no weak syllable appended to the foot).

On the metrical grid, asterisk the strong node of each pitch group.

To illustrate the application and interaction of these rules, some of Leer’s exemplifications are presented. First, consider the word “qáy.yaá.kun.” The output of the structure building rules is given in (31). The first syllable is a monosyllabic foot by rule A1a; the second syllable is a monosyllabic foot by rule A2; the third syllable remains unfooted since there is neither a string of three nor two light syllables. A grid mark is made for each of the first two syllables. Rule B creates a superfoot over each of these monosyllabic feet, and the second one incorporates the unfooted third syllable. A grid mark is made for each of the three syllables since the grid–mark assigning component of Rule B applies to both the strong and weak nodes of the superfeet, in contrast to Rule A and Rule C which both assign grid marks only to the heads of the constituent. At this point, the first two syllables have two grid marks and the third syllable has only one. Rule C creates a pitch group foot over the two superfeet, with the second superfoot as its head. A grid mark is made for the second syllable. A single asterisk, as on the third syllable, assigns low pitch; two asterisks, as on the first syllable, assign high pitch; three asterisks, as on the second syllable, assign super–high pitch.
(31)

Now consider “ta.qú.ma.lu.ní.” The fully footed form is given in (32). None of the rules in A1(a-c) apply, so an iambic foot is built over the first two syllables. This leaves three light syllables. Rule 3a leads to the construction of an iambic foot over the last two syllables of the word. The third syllable of the word is left unfooted. A grid mark is made for the second and fifth syllables, since they are heads. A trochaic superfoot is built with the first foot as its head and the third syllable as its non-head; another superfoot is built over the second foot. A mark on the metrical grid is made for the second, third and fifth syllables as these are the strong and weak nodes of the superfeet. A pitch group foot cannot be built over this word since the first superfoot is not identical with the foot it dominates. The grid markings will assign high pitch to the second and fifth syllables; low pitch to the third syllable, and no pitch to the first and fourth syllables.
Finally, consider the word "naá.ma.cf.quá" meaning 'I will suffice.' Since the initial syllable is not light, rule A1 does not apply. Rule A2 builds mono-syllabic feet over the first and fourth syllables. This leaves a string of two light syllables, to which rule A4 applies, building an iambic foot. Marks are made on the grid for the first, third and fourth syllables. Rule B leads to the construction of three superfeet, none of which have non-heads, and the placement of grid marks for the first, third and fourth syllables again. Rule C can apply once, making an iambic pitch group foot over the first two superfeet, which leads to an additional grid mark for the third syllable.
For more detailed discussion of the operation of these rules, cf. Leer (1985c).

Having illustrated the operation of the rules, I turn to a critique of this approach to building metrical structure.

3.2 Critique of the analysis

The word level prosody of Chugach can be accounted for with the analysis Leer develops. I will argue here, however, that this strength must be weighed against other aspects of the analysis. My primary critique is that the analysis introduces sweeping innovations to metrical theory, that it is at some points ad hoc (e.g. the approach to stray adjuncture), and it makes innovations which do the work of tools already well motivated for other languages (e.g. pitch group formation).
Before turning to the particular issues, note that the perspective behind both
my analysis of Chugach and the present criticisms of Leer's is one which assumes
that the primary goals of metrical theory include providing the maximally
constrained set of tools to account for naturally occurring stress patterns. In light
of this, we should attempt to test metrical theory on a wide variety of languages and
I agree entirely with Leer's (1989) comment that Chugach provides an interesting
and challenging opportunity for such testing.

I begin with Leer's foot formation rules, i.e., rules A1-A4. The first rule
essentially identifies some conditions under which an initial CV syllable gets
closed; assuming that these conditions could be stated outside of the metrical
algorithm, the rules in A essentially foot an initial closed syllable or create an
iambic foot on a sequence of initial light syllables. This is an innovation in metrical
theory to the extent that it allows a different rule for an initial string of syllables.
The crucial case illustrating this difference involves a string of three light syllables
which is footed with an iambic foot over the first and second syllables when the
string is word initial and with an iambic foot over the second and third when the
string is non-initial. In this case, these rules are non-local; in particular, whether a
light syllable becomes the head of a foot depends on whether the syllable which is
two prior to it is preceded by a word boundary. Another non-local aspect of
Leer's analysis is the conditions which are placed on the non-initial three syllable
rule. Recall that this rule, (A3), builds an iambic foot on the second and third
syllables of a three syllable string unless that third syllable has a voiceless schwa.
Since the footing is proceeding from left to right, this means that before we can
determine whether an iambic foot is built over a sequence of two unfooted light
syllables we must look ahead to determine the quality of the vowel of the subsequent syllable. That is, whether a particular light syllable gets footed depends on the quality of the vowel in the syllable which is two syllables hence. This sort of scanning does not seem to be required for other languages discussed throughout the literature on stress systems.

Finally, rule A4 builds iambic feet over remaining pairs of light syllables. The effect of rule A with its many sub-rules is that the completion of the foot-building process requires many passes over a word. First we consider the initial syllables and foot them according to rules which are specific to word-initial cases, then the entire word is scanned and heavy syllables are footed after which the entire word is scanned again for strings of three light syllables, and finally the word is scanned for remaining strings of two light syllables. This is an elaborate procedure, and I suggest that this degree of complexity should be promoted only after other alternatives have been thoroughly considered.

One result of rule A is that even with the relatively elaborate set of sub-rules which it includes, there remain unfooted syllables at the end of the process. These syllables are incorporated into metrical structure by rule B, which is the super-foot formation rule. This rule builds trochaic, binary constituents which have feet as their heads and stray syllables as their non-heads. If a stray syllable is not available to the right of the head, the super-foot is degenerate, but still well-formed. The incorporation of unfooted syllables into constituents via a stray adjunction process can be seen elsewhere in metrical analyses. For example, there are cases where a syllable which was extra-metrical when feet were assigned is incorporated into a word tree. (This seems to be the closest thing to what Leer is
Another example is Prince’s (1985) analysis of languages which have only one stress as having one binary foot to which the remaining unfooted syllables in the word are stray adjoined, to bring the word into conformity with his notion of exhaustivity. So, Leer is clearly on solid ground in appealing to the notion of stray adjunction. However, the principle behind the directionality of the adjunction is not clear. In fact, the empirical motivation for having rule B adjoin these stray syllables to the left rather than to the right is clearly the fortition facts. Recall that some consonants in the language are fortis, and that Leer’s claim is that the correct metrical structure will have fortition co-occur with the onset to a metrical constituent. Given the foot-building procedure presented in Leer (1985c), fortis consonants do indeed cooccur with the onsets to the super-feet. However, this happens only because rule B links the stray syllables to the left rather than to the right. In other words, the motivation for having left-linking of stray syllables rather than right-linking of them is ad hoc: the reason is derived from already knowing the location of the fortis consonants; there is no other principle which motivates the direction of adjunction in rule B.

The third part of this critique regards rule C, which is the rule that forms pitch groups. The pitch group formation rule accounts for the distribution of super–high pitch in the language. Recall that this rule creates an iambic foot which dominates super–feet. This level of footing is built by scanning the word from left to right and building a foot on two adjacent super–feet, but only where the left super-foot is identical to the foot it dominates, i.e., only where the left super-foot does not have a stray–adjoined syllable. This restriction on the left part of the pitch group is ad hoc insofar as it has no principled basis. Its effect is to single out those
cases where there would be no low pitch between two stressed syllables. Rule C has one effect, which is to instantiate up-stepping when no low pitch separates two high-pitched syllables.

The effects which adjacent high pitches can have on one another have been documented in the literature on tone (cf. Goldsmith 1976, Leben 1973, etc.) as well as in the literature on intonation (cf. Pierrehumbert 1980, Pierrehumbert and Beckman 1988, etc.) To the extent that the cases developed in these other sources are accurately described and analyzed, a rule which changes the quality of an H pitch accent or tone in the environment of another H is a natural rule. We can analyze the facts of Chugach in a related manner using the pitch accent assigning process and the up-stepping rule developed in §2.5. Hence, it is appropriate to critique rule C above, the pitch group formation rule, as introducing added power to phonological theory to accomplish that which other aspects of the theory were expressly designed to accomplish.

To summarize, the analysis of Chugach presented in Leer (1985c) is empirically adequate, but can be critiqued from a theoretical perspective. The foot building rule A introduces significant complications into the theory, the super-foot building rule B is ad hoc and the effects of pitch group formation rule C can be more straightforwardly captured with the tools of auto-segmental phonology.

4.0 A RELATED DIALECT

An investigation of the Chugach dialect, discussed in the the preceding sections, naturally raises the question of how such a stress pattern might emerge. Given the
continuum of stress systems seen through the Yupik languages, one possible source for investigating the source of the complexity of Chugach is a neighboring dialect. In this section, the neighboring dialect of Koniag Alutiiq is briefly examined and some speculation regarding the evolution from Koniag to Chugach is discussed.

The pattern which most clearly shows a contrast between Koniag and Chugach is that of a word–internal string of light syllables. The basic contrast is that in Chugach we find stress on every third syllable after a preceding stress whereas in Koniag stress appears on every second syllable, with some complications to be discussed below. Recall the Chugach examples from (1) and (2), some of which are repeated in (34).

(34)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>qa.ngá.te.ra.mék</td>
<td>‘from a porcupine’</td>
</tr>
<tr>
<td>b</td>
<td>a.kú.tar.tu.nír.tuq</td>
<td>‘he stopped eating akutaq’</td>
</tr>
<tr>
<td>c</td>
<td>sa.rán.i.wa.kár.tuq</td>
<td>‘he is too sleepy’</td>
</tr>
<tr>
<td>d</td>
<td>naá.qu.ma.lú.ku</td>
<td>‘apparently reading it’</td>
</tr>
<tr>
<td>e</td>
<td>úm.yuár.te.qu.té.ka.qá</td>
<td>‘I am thinking about it’</td>
</tr>
</tbody>
</table>

Each of the Chugach words in (34) illustrates patterns in which stress occurs on the third in a string of light syllables after a stress. This contrasts with the Koniag words seen in (35).
(35)

a. ítqutártuq 'he’s going to enter'
b. pígurutáqu 'my bat'
c. ágkutárután 'you’re going to go'

In the Koniag words in (35), stress appears on the second of a word–internal string of light syllables. However, the distribution of stress in Koniag is affected by the morphology of the words. Under certain morphologically conditioned circumstances, stress will appear on the third of a word–internal string of three light syllables. There are two relevant morphological conditions. If the second and third syllables of the tri–syllabic string constitute a disyllabic post–base themselves, then stress will be on the third syllable. Consider the following word.

(36)

pígurúqayá'aqá 'I could hit it against something'

Given the pattern discussed above, stress is expected to appear on the third syllable of (36), rather than on the fourth. Its appearance on the fourth is due to the fact that the third and fourth syllables together constitute a disyllabic postbase. A comprehensive list of these postbases is found in Leer (1985a, p.118–119).

The second set of circumstances in which stress in Koniag appears on the third of a string of three lights is if the second and third syllables are in the accent advancing portion of the word. The following example again shows stress on the third of three lights.
(37)

\[ \text{piqrentaq} \] 'I'm hitting it against something'

In (37), the last two syllables are inflectional (Leer (1985)) and apparently constitute an accent advancing portion of the word. These accent advancing parts usually constitute inflectional endings with mono-syllabic post-bases. Leer himself notes (p. 121ff.) that the identification of the accent advancing portions is challenging.

[The] accent advancing portion of the word is more difficult to describe succinctly and is moreover characterized by greater dialect diversity and apparently more free variation than is the case with disyllabic postbases.

The contrast between Koniag and Chugach is that default stress assignment in Koniag is on the second of a string of three lights, with morphological conditions possible advancing the stress to the third syllable. On the other hand, default stress in Chugach is on the third of such a string and the morphological conditions which advance Koniag stress are irrelevant in Chugach. In light of this difference, the contrast between the two dialects may be construed as the development of a strategy within Chugach which allows one to disregard the morphological qualifications necessary for Koniag. As Leer (p. 122) puts it, "accent advancement is generalized to all sequences of light syllables" in Chugach.
One of the differences between the theoretical characterization of the stress patterns of the two dialects is that Koniag has right-headed feet while Chugach has left-headed feet. This also can be seen to follow from the accent advancement facts. Advancing an iamb from the first two syllables in a string of three onto the second two syllables in that string, strands the first syllable. Following Leer's analysis, this stranded syllable is assumed to be stray-adjointed to the preceding foot. The effect of this is to derive a left-headed foot. The "generalization" of accent advancing in Chugach is thereby accompanied by a shift in the headedness of the constituents.

5.0 Summary and Conclusions

This chapter consists of a detailed analysis of the word-level prosody of the Chugach dialect of Alutiiq. The stress facts of this language were analyzed according to the procedure outlined in chapter one. In this specific case, left-headed templates were mapped as Uneven, Strong, and Non-tautosyllabic onto Chugach words. In addition to correctly deriving the location of stress, this analysis offers clear improvements over earlier work on this language. For example, the analysis given in this chapter derive the stress facts on HLLH sequences without recourse to ad hoc metrical restructuring rules. Furthermore, the use of syllable integrity in an anticipatory way, as proposed first in Rice (1988) and later formalized as idiosyncratic constituent boundaries in Halle (1990), is no longer necessary.