Pacific Yup'ik: Implications for Metrical Theory *

Curtis Rice
The University of Texas, Austin

0.0 Introduction Recent developments in metrical theory have led to the situation in which there are now at least four different approaches to stress assignment. One approach uses only a grid to represent the relative prominence of syllables in a word (cf. Prince 1983); aside from representational conventions, the grid-only approach differs from the other three in that it does not posit any metrical constituency. Second, the constituentized grid approach also represents stress with a grid, but by enhancing the representations with parentheses, metrical constituency is also indicated (cf. Halle and Vergnaud 1987). Hayes (1987) has recently developed an approach employing representations like those in the constituentized grid approach; I will refer to this as the templatic approach. This approach is different insofar as the constituents which are available in the theory are not derived from parameters, but rather it is the constituent templates themselves which are the primitives of the theory. The fourth approach is one in which relative prominence is indicated with arboreal structures, rather than with grids (cf. Hayes 1981, Hammond 1984).

In this paper I will present an analysis of the stress pattern of Pacific Yup'ik which follows Rice (1988), and I will claim that this analysis has important implications for each of the approaches mentioned above. Pacific Yup'ik is a particularly interesting testing ground for metrical theories; for our purposes here, the interesting aspect is that an adequate analysis of the stress pattern has broad implications for various approaches to stress assignment.

1.0 Pacific Yup'ik Data Representative data from Pacific Yup'ik are given below.[1] The data in (1a) are forms which are three or six syllables long. Note that stress appears on the second and fifth syllables, i.e. stress appears in an iterating weak-strong-weak pattern. Note that Yup'ik words can contain more than one primary stress. The data in (1b) show forms which have five syllables, where we also find stress on the second and fifth syllables, suggesting that the ternary constituents

* This is a revised version of a talk given at the Third Arizona Phonology Conference in March, 1990. In addition to expressing my thanks to several participants for helpful comments on the content of this paper, I would also like to thank Mike Hammond and the others involved in organizing the conference, and Jane and Ken Hill for being gracious hosts. I also appreciate comments from Juliette Blevins, Cindie McLemore, Don Weeda and Tony Woodbury on earlier versions of this work.

[1] The following discussion of Pacific Yupik would not have been possible without the careful fieldwork and insightful discussion by Jeff Leer, whose work is published in Krauss (1985). All data here come from Leer's work which the interested reader is encouraged to consult.

are built from left to right, rather than from right to left. (1c) shows a word which is four syllables long with stress on the second and fourth syllables. The data in (1a, b, and c) suggest an analysis which would build iterating amphibrachs, i.e. ternary constituents with heads in the middle, from left to right across the string of syllables.

1a	paláyaq	'rectangular skiff'
	qənáwik	'hospital'
	qayákun	'by boat'
	akútaɣ̣tunífɣ̣tuq	'from a porcupine'
	saɣ̣ániwakáɣ̣tuq	'he is too sleepy'
1b	taqúmalunf	'apparently getting done'
	qaŋátaɣ̣amák	'from a porcupine'
1c	atún'iɣ̣túq	'he stopped singing'
1d	naá'uq	'it's burning'
	mulúk'uút	'milks' (pl. of noun)
	ánciquá	'I'll go out'
	naáqumalúku	'apparently reading it'
1e	pi.lú.liá.qa	'the fish pie I'm making'
	qáy.yaá.kun	'by his boat'
	úm.yuáɣ̣.tə.qu.tá.ka.qá	'I am thinking about it'

In (1d) we see data which at first may not appear to follow this pattern. However, when we realize that syllables with a branching nucleus are treated as bi-moraic and that stress is constructed over moras rather than syllables, we can see that the distribution of stress for these data follows from the same procedure that accounts for the distribution of stress in 1a-c. A closed syllable in initial position is also treated as bi-moraic, for reasons which are not important here.[2] The last part of the analysis which must be mentioned is suggested by the

[2] Cf. Hayes (1989) and Rice (forthcoming) for different views on the treatment of initial closed syllables. See also the discussion by Leer.

data in (1e). These data show us that the principle of syllable integrity is respected in this language.[3] This principle is stated in (2) and its effect is to begin a new foot at every bi-moraic syllable.[4]

2) Syllable integrity : The moras of a bi-moraic syllable must belong to the same metrical constituent.

By respecting syllable integrity, this analysis accounts for the distribution of stress in all of the data in (1). The analysis is summarized in (3).

3) a. The mora is the stress bearing unit. (Syllables with long vowels and initial closed syllables are bi-moraic.)
b. Metrical constituents are constructed from left to right, respecting syllable integrity.
c. The constituents are [+BND, -HT], i.e. they are amphibrachs.[5]

2.0 Problems Now that we have seen the analysis for Pacific Yup'ik, I turn to the implications which this analysis has for the approaches to stress assignment mentioned in the introduction.

2.1 The grid There is a phonological process in this language which Leer refers to as fortition. The description of the phonetics of this phenomenon says that fortition is a process whereby some consonants get lengthened, although they are not lengthened to the point that they become geminates. In (4), a few of the forms which were seen in (1) are given again, this time with underscoring to indicate which consonants are fortis.

4)

mulúk'uút	paláyaq
ánciguá	qanáwik
naáqumalúku	sayániwakáytuq
pi.lú.liá.qa	taqúmaluní

---

[3] Since independently developing this principle in Rice (1988), it has come to my attention that Harms (1981) suggests the term "di-moraic syllable integrity" with essentially the same meaning. Furthermore, J. McCarthy informs me that A. Prince discussed this principle in early unpublished work. The idea of syllable integrity is also implicit in Hayes (1987).

[4] This point is argued in Rice (1988) based on forms such as [naá.ma.ci.quá], 'I will suffice.'

[5] Some aspects of the distribution of stress (e.g. metrical restructuring and secondary stress) are being left aside in this paper as they are irrelevant to the issues being raised with regard to various approaches to stress assignment. For a more complete analysis and for arguments against alternative analyses, see Rice (1988, 1989, forthcoming).

There is no particular segmental environment which allows us to predict which consonants are fortis, rather fortition seems to be sensitive to prosodic structure. We could generalize the distribution of these consonants by claiming that fortis consonants appear in the onset to a heavy syllable and in the onset to a light syllable which precedes a stressed light syllable. However, there is a more unified generalization available: every foot-initial consonant in a word is fortis. This will include word initial consonants; in fact, in his description of fortition, Leer notes that fortis consonants sound like word-initial consonants. Fortis consonants and the word initial ones share the characteristic of being foot-initial. A formalization of this process is given below.

$$C \dashrightarrow [+\text{fortis}] \,/\, [_{F} \_\_$$

This ability to predict the distribution of fortis consonants lends support to the analysis in (3), since their distribution is predictable if it is tied to the beginning of a foot boundary.[6]

Fortition in Pacific Yup'ik is an example of a phonological process which is sensitive to metrical structure. Evidence of processes which are sensitive to metrical constituency are a problem for a grid only approach to stress assignment because in that approach there are no constituents. Without constituency, we would be forced to suggest a more complicated understanding of fortition. The ability to account for the distribution of fortition as above can be taken as both an advantage of an approach which uses metrical constituents and as a deficiency of a grid-only approach. As phonologists accumulate more examples of processes which are most straightforwardly analyzed with reference to metrical structure, maintaining a grid-only approach will become increasingly difficult.

2.2 The constituentized grid. We now turn to one very specific proposal from the theory of stress assignment proposed by Halle and Vergnaud (1987). Halle and Vergnaud construct a theory which does allow for ternary constituents in order to present an analysis of Cayuvava, discussed in Levin (1988). To clarify the operation of their theory and highlight the problems which are raised when we apply their analysis to Pacific Yup'ik, we briefly review the facts and analyses of Cayuvava.

Representative Cayuvava data, from Levin (1988), are given in (5). The analysis which Levin develops marks the final syllable as extrametrical and constructs amphibrachs from right to left. However, in

---

[6] Note, however, that Leer also obtains this result regarding the distribution of fortis consonants. The approach there is significantly different from the one presented here and from those outlined in the introduction. See Leer (1989) for some comments comparing our different analyses.

(5b) and (5e), which have five or eight syllables, the initial syllable is, perhaps surprisingly, unstressed. Levin proposes a de-footing rule, also seen in (5), which removes a mono-syllabic foot before another foot.

5)	a	[ki.hí.βe.re]	'I ran'
	b	[a.ri.ká.ja.hi]	'he has already fallen'
	c	[pó.po.he.cé.βa.ka]	'inside of cow'
	d	[ma.rá.ha.ha.é.i.ki]	'their blankets'
	e	[i.ki.tá.pa.re.ré.pe.ha]	'the water is clean'
	f	[cá.a.di.ró.bo.βu.rú.ru.ce]	'ninety-nine'

Levin's (1988) analysis:
a) Final syllable is extrametrical,
b) Construct iterating amphibrachs from right to left,
c) De-footing: $\downarrow$ --> Ø / ___ F

Halle and Vergnaud essentially adopt Levin's analysis of Cayuvava, except that they use a different approach to explain the absence of stress in those cases in which Levin invokes the de-footing process. Their approach is to invoke the Recoverability Condition, stated in (6). This condition requires that the location of the boundaries for a constituent be recoverable if we know the location of the constituent head and the direction of government.[7]

6) Recoverability condition: Given the direction of government of the constituent heads in the grammar, the location of the metrical constituent boundaries must be unambiguously recoverable from the location of the heads, and conversely the location of the heads must be recoverable from that of the boundaries. (Halle and Vergnaud 1987: p. 10)

Halle and Vergnaud tell us that the direction of government in Cayuvava is unspecified, which means that a non-head can be either to the left or to the right of the head. They claim that the reason stress is not on the initial syllable in (5b) and (5e) is because if that syllable were stressed the Recoverability Condition would be violated. In (7)

[7] Although not explicitly stated by HV, I assume that direction of government means the direction which the non-heads are from the heads.

we see forms in the Halle and Vergnaud formalism which have the same length as (5b).

7)

```
*  .  *  .                    *  .  *  .
(*  *)(*  *) <*>              (*)(*  *  *) <*>
```

The final syllable is marked as extrametrical and the heads which would be present if the initial syllable were stressed are marked. Halle and Vergnaud claim that both of the constituent boundaries seen in (7) are compatible with the given location of the heads and an unspecified direction of government. Therefore, the stress pattern in (7) is in violation of the Recoverability Condition and it cannot be allowed to exist. To correct the situation, the head of the initial constituent is removed which leads to the removal of the constituent boundaries as well. This is Halle and Vergnaud's explanation for the absence of stress on the initial syllables in (5b) and (5e); to the extent that this part of their analysis is correct, HV do not need the destressing rule of Levin's analysis.

Their discussion of the role of the Recoverability Condition in Cayuvava leads Halle and Vergnaud (p. 130) to make a generalization about the nature of stress systems with iterating ternary patterns. This generalization says that "two consecutive constructed heads in a ternary metrical structure are separated by at least two intervening positions." This is a strong claim, and their analysis of Cayuvava depends on the empirical correctness of this generalization.

I have argued above that Pacific Yup'ik is a language which has constructed heads in a ternary pattern. However, there are several forms which have only one position intervening between stresses. A number of forms which are counter-examples to Halle and Vergnaud's generalization are given below.

8)	a	a.tún.'ir.túq	'he stopped singing'
	b	taá.ta.qá	'my father'
	c	taá.taá	'her father'
	d	mu.lúk.'uút	'milks' (pl. of N)
	e	mu.lú.kuút	'if you take a long time'
	f	pa.lát.kaáq	'tent'
	g	pi.lú.liá.qa	'the fish pie I'm making'

(8a) is analogous to the problematic Cayuvava cases since it has four moras within the domain of the stress rule. In Cayuvava, the

fourth syllable from the edge of the domain where footing begins is not stressed, whereas in Pacific Yup'ik it is, apparently in violation of the RC. (8b-f) are analogous to (8a) since they have four moras. (8g) also has two stresses separated by only one position; this is a result of the quantity sensitivity in this case.

The data of Pacific Yup'ik, to the extent that the analysis I have argued for is correct, must be taken as a counter-example to the generalization given above and we must furthermore conclude that the Recoverability Condition is in fact not a primitive of a stress theory which is cross-linguistically adequate.[8]

2.3 The templatic approach In recent work, Hayes (1987, 1989) has developed a fundamentally different approach to stress assignment which, as noted earlier, gives templates rather than parameters as primitives of the theory. These revisions have two motivations: they are intended to address the over-generation of basic templates which happens in parametric approaches and they are intended to capture some "natural" facts about rhythmic parsing. For example, they capture the claim that in iambic systems, prominence is indicated by length. The following sections are based on Hayes (1987, 1989) and on preliminary sections from Hayes (in progress).

2.3.1 Empirical Adequacy The three templates which Hayes (1987) proposes are given below. The possible instantiations of each type are also given: parentheses indicate constituency, an "x" indicates a head, and a period indicates a non-head. An analysis of the stress pattern of a language consists of determining what kind of template is to be used and then iteratively constructing it across the word, either from left to right or right to left.

A. Syllabic trochee: Form $\overset{(x\ .)}{\sigma\ \sigma}$ if possible; otherwise form $\overset{(.)}{\sigma}$.

B. Moraic trochee: Form $\overset{(x\ .)}{m\ m}$ if possible, where $\overset{(x\ .)}{m\ m}$ is either $\overset{(x\ .)}{\breve{}\ \breve{}}$ or $\overset{(x)}{-}$; otherwise form $\overset{(.)}{\breve{}}$.

C. Iamb: Form $\overset{(.\ x)}{\breve{}\ \sigma}$ if possible, otherwise form $\overset{(x)}{-}$ or $\overset{(.)}{\breve{}}$.

---

[8] I thank Morris Halle for earlier discussions about the conclusions of this section.

Hayes' attempts to address the problem of over-generation in other approaches are important and must be pursued further. However, the templatic approach presented in Hayes (1987, 1989) replaces the problem of over-generation with one of under-generation. This is most apparent in Hayes (1989) in which the stress patterns in the Yup'ik languages are to be analyzed using the templatic approach. In the introduction to that paper it is noted that one of the four main branches of Yup'ik is Pacific Yup'ik; however, there is no further discussion of the data from this branch and there is similarly no proposed analysis. While it is clear that Hayes (1989) does further our understanding of other branches of Yup'ik, no analysis of the distribution of stress in Pacific Yup'ik can be presented because there simply is no analysis available using the particular templatic approach presented in that work.

2.3.2 Weak Local Parsing The empirical inadequacy suggested above is addressed by Hayes (in progress), in which the templatic approach is further developed to allow an analysis of ternary systems.[9] In this section these recent developments are presented and the Pacific Yup'ik stress pattern is considered in light of them.

Hayes suggests the possibility that strings of syllables need not be exhaustively parsed into metrical constituents at the foot level.[10] To restrict his approach to non-exhaustivity, Hayes invokes a view of locality. Metrical constituents are allows to be non-adjacent but they must be local, even if in a "weak" sense of the notion of locality. The Foot Parsing Locality Parameter is suggested with the unmarked and marked values as follows.

Foot Parsing Locality Parameter

Unmarked value: Feet must be constructed adjacently. I.e. they are constructed under the constraint of strong local parsing.

Marked value: Feet may be constructed separated from each other by the minimal prosodic distance. I.e. they are constructed under the constraint of weak local parsing.

---

[9] Hayes (in progress) presents an analysis of Cayuvava , but there is not, in the current early version, an analysis of Pacific Yup'ik. However, Hayes does suggest what the analysis of PY should be, and the comments in this section are based on those suggestions. For more extensive discussion of the templatic approach, see Rice (forthcoming). See also Weeda (1989) for a modified templatic approach addressing the possibility of ternary systems.

[10] For a related discussion, see Blevins (1990), where several arguments are developed for a metrical constituent structure building parameter [+/- iterative]. The non-exhaustivity suggested by Hayes is of a different type than that which Blevins is proposing. In particular, the only non-exhaustive parsing which is allowed in Blevins' approach follows from the construction of only one constituent. On the other hand, Hayes' non-exhaustivity allows the construction of multiple constituents, i.e. it is [+iterative], but the constituents, as we will see, need not be adjacent.

To use weak local parsing, the minimal prosodic distance must be specified. For quantity insensitive systems, this distance is one syllable and for quantity sensitive systems it is one mora. A weak local parsing approach to Pacific Yup'ik will be one in which metrical constituents are separated by one mora.

Before considering a few examples from Pacific Yup'ik, we can see the operation of weak local parsing by briefly considering Hayes' analysis of Cayuvava. Recall that the stress pattern in Cayuvava could be described by marking the final syllable as extrametrical and constructing amphibrachs from right to left. Hayes' analysis also marks the final syllable as extrametrical; then syllabic trochees are constructed from right to left, under weak local parsing. Since Cayuvava is a quantity insensitive language, the minimal prosodic distance is one syllable. So, the constructed metrical constituents will be separated by one syllable. This analysis also offers an explanation for the absence of stress on the initial syllable in words of five or eight syllables (cf. Levin's de-footing rule and Halle and Vergnaud's Recoverability Condition in §2.2 above.) Consider the following schematic for foot construction on forms with six, four, and five syllables.

9) a.
(x .) (x .)
σ́ σ σ σ́ σ ‹σ›

b.
(x .)
σ σ́ σ ‹σ›

c.
(x .)
σ σ σ́ σ ‹σ›

In all of the forms the final syllable is marked as extrametrical, a trochee is constructed over the penultimate and antepenultimate syllables and the pre-antepenultimate syllable is skipped. In (9a) another trochee is constructed and in (9b) there are no more syllables hence no more constituents. In (9c), however, there is another syllable preceding the skipped one so it is scanned for foot construction, however Hayes suggests that no constituent can be constructed on this remaining syllable since degenerate feet are not allowed in Cayuvava.[11]

Pacific Yup'ik will be a system in which iambic templates are constructed from left to right under weak local parsing. Since PY is quantity sensitive, the minimal prosodic distance between the feet will be one mora. First consider cases analogous to the Cayuvava cases

[11] Apparently the possibility of degenerate stressless mono-moraic feet (cf. §2.3.1) which was proposed by Hayes (1987) has been abandoned.

above, i.e. strings of mono-moraic syllables. Since there is no extrametricality in PY, the strings are five, three, and four syllables long.

10) a.
(. x) (. x)
σ σ́ σ σ σ́

b.
(. x)
σ σ́ σ

c.
(. x) (x)
σ σ́ σ σ́

Each of these strings will have an iamb constructed at the left edge and the third syllable will be skipped. In (10a) another iamb is constructed and in (10b) there are no more syllables. In (10c), however, we can see how PY and Cayuvava exhibit a parametric difference in this approach. Cayuvava does not allow degenerate feet while PY does; therefore, a degenerate foot can be constructed on the final syllable of (10c).

A consideration of words with heavy syllables raises some complications for this approach. The first difficulty follows from Hayes' claim that iambs are constructed over syllables rather than moras. In a case analogous to (10c) above, (11) shows a string of four moras where the last two are tauto-syllabic will have stress on the second and fourth moras. In the templatic approach, the first two light syllables are grouped into an iamb; the third mora is skipped and the fourth mora will be a degenerate foot. However, there is no moraic iamb, hence it would seem that there is no possibility of a degenerate mono-moraic foot in which the mora in that foot is the second of two in a heavy syllable. Furthermore, if syllable integrity holds cross-linguistically, this analysis requires a modified version from that stated above. In this analysis, syllable integrity would have to mean that tauto-syllabic moras cannot be in different feet, which would allow one of them to be unfooted and one to be a degenerate foot.[12]

11)

(. x) (x)
$[\mu]_{\sigma}$ $[\acute{\mu}]_{\sigma}$ $[\mu$ $\acute{\mu}]_{\sigma}$
↑ skip

12 Hayes suggests that the syllables left stray at the foot level will be incorporated somehow at a later level. Depending on the approach taken, the later-level incorporation could violate even this weak version of syllable integrity. Evaluating the success of this approach with regard to the fortition facts discussed in §2.1 is not possible without a clarification of the treatment of these stray syllables.

Further complexities arise when we consider (12). Here the third and fourth moras are tauto-syllabic. Stress is on the second and fourth moras. When the third mora is skipped due to weak-local parsing, the second iamb will be constructed as shown in (12a) over the fourth and fifth moras, incorrectly predicting stress on the fifth mora. Perhaps this could be corrected by invoking a further modified principle of the possible behavior of tauto-syllabic moras. For example, this example may suggest a principle of syllable fidelity, which would state that if one mora of a heavy syllable is in a full foot, the other mora in that foot must be the tauto-syllabic one. This principle would rule out a constituent consisting of the fourth and fifth moras of this word. The fourth mora, as seen in (12b), will be a degenerate foot and the fifth will be skipped. However, this solution runs into the difficulties discussed in connection with (11).

12a) * (. x) $^{skip}\downarrow$ (. (x)
[μ]$_\sigma$ [μ́]$_\sigma$ [μ μ́]$_\sigma$ [μ]$_\sigma$

12b) (. x) $\underset{skip}{\uparrow}$ (x) $\underset{skip}{\uparrow}$

A solution to this problem for Hayes' theory follows if we revise our understanding of weak local parsing and the minimal prosodic distance. In particular, since iambs are constructed over syllables, perhaps the only prosodic unit which can be skipped is a syllable. However, since PY is a quantity sensitive system, the minimal prosodic distance is one mora. So, in this language, since the metrical constituents are iambs, the parsing proceeds by syllables. Weak-local parsing does operate in PY, however a syllable can only be skipped when it is mono-moraic. In other words, weak local parsing here cannot operate to skip a mora if that mora is one of two tauto-syllabic moras. The effect of this is that a heavy syllable will be an iambic constituent, regardless of its position in the word.[13] With this modification, the case in (12) will correctly have stress assigned to the second and fourth moras; the fifth mora, being a mono-moraic syllable, will be skipped due to weak local parsing.

2.4 The arboreal grid The analysis of PY which has been presented above has implications for any current approach to stress assignment, as is evident from the preceding sections. To analyze the PY data with an arboreal grid approach requires access to ternary constituents. The analysis suggested above for PY should be taken as further evidence for the modifications suggested in Levin (1988). PY is not only another

[13] It remains to be seen whether a language which employs moraic trochees could allow syllable integrity violations of the type discussed here .

case which requires amphibrachs, it is a case which requires quantity sensitive amphibrachs. Maintaining the viability of the arboreal approach requires allowing for these kinds of constituents.

PY is a quantity sensitive language in the sense that the pattern which we see on strings of light syllables is interrupted or modified in strings which contain heavy syllables. The analysis which has been suggested here instantiates quantity sensitivity by a particular interpretation of the principle of syllable integrity. Rice (1988) argues that approaches to quantity sensitivity which have developed elsewhere are inadequate for an analysis of PY. This suggests that there are at least two formal devices for describing a quantity sensitive system; one approach restricts the construction of feet so the that non-heads cannot dominate heavy syllables, the other approach constructs feet which respect syllable integrity. It remains to be seen whether these perspectives on quantity sensitivity can be collapsed.

3.0 Conclusion In this paper, we have considered an analysis of the distribution of primary stress in Pacific Yup'ik and some of the problems which it raises for various approaches to stress assignment. The criticisms presented here, however, are not intended to indicate that these approaches should be dismissed. On the contrary, bringing the Pacific Yup'ik data into the discussion can lead us to further refinements and ultimately to a tightly constrained and thoroughly well-motivated metrical theory of stress assignment.

References

Blevins, J. 1990 "Alternatives to exhaustivity and conflation in metrical theory," ms., University of Texas, Austin.

Halle, M. and J.-R. Vergnaud 1987 *An essay on stress*, MIT Press.

Hammond, M. 1984 *Constraining metrical theory*, Ph.D. diss., UCLA.

Harms, R. 1981 "A backwards metrical approach to Cairo Arabic stress," *Linguistic Analysis*, 7.

Hayes, B. 1981 *A metrical theory of stress rules*, Ph.D. diss., MIT.

Hayes, B. 1987 "A revised parametric theory of stress," *NELS* 17.

Hayes, B. 1989 "Stress and syllabification in the Yup'ik languages," ms. UCLA.

Hayes, B. in progress, *Principles of metrical stress theory*, ms. UCLA.

Krauss, M. 1985 *Yupik Eskimo prosody systems*, Fairbanks: University of Alaska.

Leer, J. 1985a "Prosody in Alutiiq," in Krauss (ed.), pp. 77-133.

Leer, J. 1985b "Evolution of prosody in the Yup'ik languages," in Krauss,135-157.

Leer, J. 1985c "Toward a metrical interpretation of Yup'ik prosody," 159-172.

Leer, J. 1989 "A test of Halle and Vergnaud's exhaustivity and recoverability conditions," ms., Alaska Native Language Center, Fairbanks.

Levin, J. 1988 "Generating ternary feet," in *Texas Linguistic Forum* 29.

Prince, A. 1983 "Relating to the grid," *Linguistic Inquiry* 14.

Rice, C. 1988 "Stress assignment in the Chugach dialect of Alutiiq," in *Chicago Linguistic Society*, 24.

Rice, C. 1989 "An auto-segmental analysis of secondary stress in Chugach Alutiiq," talk given at LSA, New Orleans, and ms. University of Texas, Austin.

Weeda, D. 1989 "Trimoraicity in Central Alaskan Yup'ik and elsewhere," ms. UT.

Woodbury, A. 1987 "Meaning phonological processes: A consideration of Central Alaskan Yup'ik Eskimo prosody," *Language*, 63: 685-740.