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Buriat Syllable Weight and Head Prominence

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In this paper I examine the relation between syllable structure and weight in Buriat. In general, syllables which have maximal constituency are heavy. However, I argue here that in some cases a syllable may have maximal constituency without being heavy. I will show that Buriat syllables generally conform to a typology in which only vowels contribute weight and a CVVC syllable form is maximal, as it has the maximal two moras as well as a maximal onset and coda. Yet one case appears to be the exception to this generalization. (C)Vηg is the only syllable form in Buriat with a final consonant cluster (η represents a velar nasal stop here and in subsequent transcription). Furthermore, it has two apparently conflicting properties, namely that it is maximal in its constituency, so CVVηg is not possible, yet it patterns as light with respect to stress. In a derivational framework, these facts appear to require the elaborated nuclear moraic model of syllable structure proposed by Shaw (1992, 1993). However, I will demonstrate that this patterning can in fact be explained with a simpler moraic constituent structure for syllables in an optimality theoretic framework, where constraints are conceived of as violable (see Prince & Smolensky 1993, McCarthy & Prince 1993a, b). In this discussion I propose a violable constraint penalizing branching constituency in moras. I argue that this constraint in combination with standard syllable structure constraints and the independently motivated notion of head prominence can predict precisely the set of Buriat syllable forms and their patterning with respect to weight without requiring the nuclear moraic model. Concluding discussion shows that the analysis proposed here has interesting implications for both maximal constituency effects and moraic domination of coda consonants.

The organization of this paper is as follows. In section 1 I describe the Buriat syllable typology and the apparent paradox presented by the (C)Vηg syllable form and then outline the generalizations that may be drawn concerning Buriat syllable structure. In section 2 I show that although it appears that a nuclear moraic structure is necessary to account for the patterning of Buriat (C)Vηg syllables in a derivational framework, a simpler structure without the nuclear moraic structure approach is sufficient in an optimality theoretic analysis. Section 3 presents the concluding discussion.

1 Buriat Syllable Structure

1.1 The Basic Buriat Syllable Forms

The majority of Buriat syllables in the native vocabulary conform to the typology in (1) (Poppe 1960):

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(1)		Basic Form	Examples
	a.	V, VV	[.a.ba.] 'hunt', [.oi.] 'forest'
	b.	CV, CVV	[.ta.] 'you', [.taa.] 'guess!'
	c.	VC, VVC	[.em.] 'medicine', [.ail.] 'group of yurts'
	d.	CVC, CVVC	[.tag.] 'shelf', [.bool.] 'slave'

In (1), C represents any nonvocalic segment, including glides, and V represents a vowel. VV signifies a geminate vowel or a diphthong consisting of two distinct vowels. In the transcription of Buriat forms, a period is used to mark syllable edges.

1.2 The Apparent Exception

In addition to the basic syllable shapes given in (1), Buriat has one other syllable form:

(2) (C)Vηg [.aηg.da.] 'to the wild animals, game', [.saηg.] 'tin'.

Yet interestingly, the following syllable structure does not occur:

(3) *(C)VVηg, where the ηg cluster is tautosyllabic.

An obvious question is whether what is transcribed as [ηg] does in fact have a final [g]. Poppe is quite explicit on this issue. He specifically identifies [ηg] as the only native tautosyllabic consonant cluster (1960: 13, 18) and distinguishes it in transcription from [η], e.g. [aηxaη] 'beginning' versus [aηg] 'wild animal'. All [ηg] clusters are derived through a nasal place assimilation process which applies when /n/ is followed by a velar consonant. [η] only appears as an allophone of /n/ and occurs just in this environment and word-finally. Note that it is only a tautosyllabic [ηg] cluster which blocks a VV nucleus, because [η] or [g] alone in a coda is compatible with a heavy nucleus e.g. [.xu.r^{j}aaη.gii.] 'brief, abbreviated' and [.tur.laag.] 'jay'.

I assume that the absence of the syllable structure in (3) is not an accidental gap. The absence of this syllable form suggests that (C)Vηg syllables have maximal constituency. If maximal constituency is interpreted as corresponding to weight, a (C)Vηg syllable would then be expected to pattern as heavy. However, a clear test for syllable weight is the quantity sensitive stress system of Buriat, and (C)Vηg in fact patterns with the light syllables with respect to stress. I turn now to a discussion of the details of this stress pattern.

1.2.1 Buriat Stress

The Buriat stress pattern is reported by Poppe to apply as follows:

> Stress... is on the first syllable unless there is a geminate vowel phoneme or a diphthong in one of the non-first syllables. In the latter case, the stress is on the geminate vowel or diphthong respectively. If there are several non-first syllables containing geminate vowel phonemes or diphthongs, the stress is on the penultimate of them (1960: 19).

Note that syllables with geminate vowels or two distinct vowels (diphthongs) can attract stress, consistent with the fact that these types of syllables always qualify as heavy across languages. However, (C)Vηg syllables do not pattern with these heavy syllables in the quantity sensitive stress system. Some examples of the stress assignment are given in (4-6) (forms are from Poppe 1960 and Bosson 1962, p.c. 1994). In these examples, an arrow points to the syllable which receives stress.

(4a) ↓
L L L
.zo.bo.loŋg. 'suffering' (No geminate vowel/diphthong)

(4b) ↓
L L L
.xa.na.da. 'on the wall' (Compare with (4a))

(5a) ↓
L L L H
.ˇzar.ga.laŋg.daa.'happiness' (dat.-loc.) (One geminate vowel/diphthong)

↓
L H L
.xu.daa.liŋg. 'Parents of the husband in mutual relation'

(5b) ↓
L L L H
.mo.rid.tom.nai. 'to our horses' (Compare with (5a))

(6a) ↓
L H L H
.xu.daa.liŋg.daa. 'Parents of the husband in mutual relation' (dat.-loc.) (multiple geminate vowel/diphthongs)

(6b) ↓
L H H H
.da.lai.gaa.raa. 'by one's own sea' (Compare with (6a))

From data such as that in (4-6), it is evident that (C)Vŋg syllables do not attract stress. This patterning suggests that either these syllables are light (have only one mora) or that only moras associated with vowels are visible for stress. I will pursue these alternatives in section 2.

1.2.2 Summary of the Problem

The questions raised by the (C)Vŋg syllable forms may now be summarized as follows:

(7) a. What is the internal structure of (C)Vŋg syllables?
b. Why do (C)Vŋg syllables pattern as if they were light, yet block a second moraic element from being added?
c. Why is [ŋg] the only possible syllable-final consonant cluster?

The analysis in section 2 focuses on the first two questions. The latter question will not be explored in detail here[1].

[1]A possible approach to answering the question in (7c) is to suppose that dorsal segments have a special status in Buriat such that a constraint requiring that a dorsal segment be parsed is ranked above constraints requiring the parsing of coronal and labial segments. It could then be supposed that whatever constraint is uniquely violated in the parsing of the [ŋg] cluster is ranked above the constraints requiring the parsing of labial and coronal segments, so that parsing of clusters with dorsal segments could force a constraint violation that could not be violated in the parsing of clusters with labials and coronals. Alternatively, it may be that only dorsal segment clusters appear in codas, because dorsal is the least marked place in this

An explanatory account of Buriat syllable structure and weight will be one which shows that (C)Vηg syllables are not simply exceptional, but are in fact subject to the same constraints and conditions as the apparently more unified set of basic syllable structures outlined in section 1.1. Before discussing the analysis of the (C)Vηg syllables I will outline the generalizations that hold of all of Buriat syllable structure.

1.3 Buriat Syllable Structure Generalizations

Based on the preceding typology, various generalizations may be made regarding Buriat syllable structure. Concerning the structure of onsets and codas, the following observations hold:

(8) a. Onsets and codas are optional.
b. Onsets and codas are noncomplex.

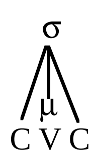
(8a) may be transparently observed from the syllable structures in (1-2). (8b) generalizes for all syllable forms except perhaps (C)Vηg ones[2]. Whether noncomplexity of codas holds in (C)Vηg syllables will be examined in the analysis in section 2.

Since only syllables with a diphthong or geminate vowel pattern as heavy in the quantity sensitive stress pattern of Buriat, coda consonants do not appear to have moraic weight. Accordingly, the generalizations in (9) concerning syllable constituent weight may be added:

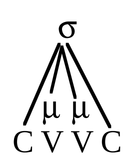
(9) a. All vowels and only vowels have moraic weight.
b. Syllables have maximally two moras.

The generalizations in (8-9) can be translated into phonological constraints active in Buriat. These must be grounded in a theory of universal syllable structure. The structures in (10) represent the most basic model of a moraic structure for a CVC and a CVVC syllable form (for discussion of a moraic model of syllable structure see, for example, Hyman 1985, McCarthy & Prince 1986, Zec 1988, Hayes 1989, Itô 1989). In some moraic models, all nonmoraic rhymal material is appended under a mora, but I will argue that segments are only adjoined under moras under special conditions and that this material is in fact generally an immediate dependent of the syllable node, conforming to a weak layering model of prosodic structure (Pierrehumbert & Beckman 1988, McCarthy & Prince 1991a, b, Itô & Mester 1992).

(10) a.



b.



The structures in (10a-b) will clearly account for all of the basic Buriat syllable forms. Accordingly, a preferred account for the (C)Vηg forms would complicate these structures only minimally.

Now consider the active constraints in Buriat syllable structure, as suggested by (8-

position (Trigo 1988). In either case, the question of why tautosyllabic [ηx] clusters are not found in Buriat would remain (/x/ is the only other velar consonant in Buriat). A possible explanation is that these clusters are excluded by failing to satisfy the minimal sonority distance between adjacent tautosyllabic segments.

[2]In borrowings, the noncomplexity of onsets and codas does not always hold and instead conforms to the syllable structure of the original language. For example, /blank/ 'office form' is borrowed from Russian without any changes to the syllable structure.

9). (9b) states that syllables may have maximally two moras. This can be accounted for by the constraint in (11), which penalizes any syllable with three or more moras.

(11) $*_{\sigma}[\mu\mu\mu]$

The constraint in (11) is inviolable in Buriat and possibly is universally inviolable, suggesting that in optimality theory (OT) terms it universally has superordinate ranking or is in *Gen*.

(8a) states that onsets and codas are optional in Buriat. In OT, where constraints are ranked and violable, this patterning is accounted for by ranking the faithfulness constraints, PARSE and FILL above the syllable form constraints, ONS and NO CODA (for the relevant ranking arguments see Prince and Smolensky 1993a). (8b) states that Buriat onsets and codas are noncomplex. This indicates that the constraints $*\text{COMPLEX}^{ons}$ and $*\text{COMPLEX}^{coda}$ are generally unviolated in Buriat. However, it has yet to be established whether (C)Vηg syllables violate $*\text{COMPLEX}^{coda}$, so I will defer discussion of the role of this constraint to the analysis of these forms.

Finally, (9a) states that all vowels and only vowels have moraic weight. I suggest that this generalization is the result of two independent constraints, both of which belong to the family of ASSOCIATE constraints (in Prince and Smolensky's terms 1993: 128). The first constraint I propose penalizes a structure in which a vowel is not linked to a mora. This constraint is given in (12a). The second constraint, given in (12b), penalizes a parse in which a mora does not immediately dominate a vowel. I have formalized these association constraints as follows. An ASSOC constraint takes two arguments which are phonological constituents (PhCon). These arguments are ordered and enclosed in parentheses. The constraint is then interpreted according to the model ASSOC (PhCon1, PhCon2): ∀PhCon1 ∃PhCon2 such that PhCon1 is associated to PhCon2. Note that ASSOC constraints say nothing about the dominance relation of the phonological constituents. This relation will follow from universal ranking in phonological structure.

(12) a. ASSOC (V, μ): For all V, there exists some μ, such that V is associated to μ[3].
b. ASSOC (μ, V): For all μ, there exists some V, such that μ is associated to V.

The constraints in (12) together require that all vowels be moraic. However, they do not make reference to the dominating nodes of consonants in the prosodic structure. In particular, they do not rule out a structure in which a consonant occurs under a mora when the mora also dominates a vowel. I suggest that this structure is possible, but only under special circumstances. To militate against this type of structure in general, I propose one additional constraint against branching moras:

(13) *BRANCH μ: No branching mora.

Structures in which a mora immediately dominates more than one constituent (besides itself) will violate the constraint in (13). I assume that multiple branching incurs multiple violations, i.e. binary branching incurs one mark, ternary branching, two marks, etc. In an OT framework, due to the constraint in (13), the branching mora structure will only occur when forced by a higher ranking constraint.

I have now outlined the generalizations concerning Buriat syllable structure and have discussed their implications for the active constraints in Buriat. However, the analysis of (C)Vηg syllables remains to be discussed. This will be the focus of the following section.

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[3]I do not adopt V as a node dominating a vowel. I use V here as shorthand for the root nodes of vowels, which can be defined as the set of root nodes bearing sonority greater than or equal to /i/.

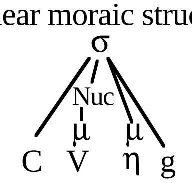
2 Analysis of (C)Vηg Forms

2.1 The Nuclear Moraic Structure

In developing an analysis of the (C)Vηg syllables in Buriat I will address the questions raised in (7a-b) concerning their internal structure and patterning in stress. I will begin by briefly considering the structure which appears to be required in a derivational framework where constraints are inviolable.

As noted earlier, an approach to explaining the patterning of (C)Vηg syllables with respect to stress is to claim that only moras associated with vowels are visible for stress. The nuclear moraic structure proposed by Shaw (1992, 1993) provides a ready means of making such a distinction. This model would require increasing the complexity of syllable structure by the addition of a Nuclear (Nuc) node to the more basic moraic syllable model, as illustrated in (14).

(14) Nuclear moraic structure



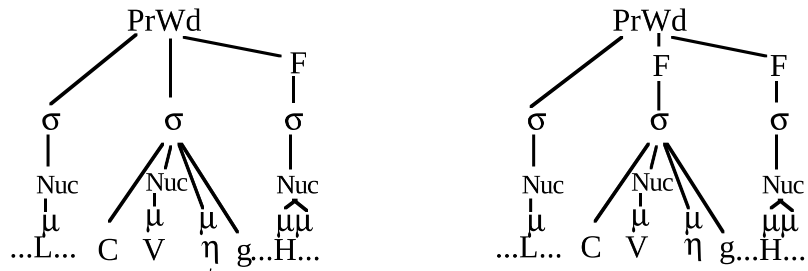
Under this approach, nonfinal coda consonants in addition to vowels would have moraic weight, but only vowels would qualify as nucleic material. A Buriat coda could thus be comprised of a moraic [η] and a nonmoraic consonant, provided that the moraic constituency of the syllable does not exceed two. Crucially, since the [η] in the cluster is moraic in (14), the resulting (C)Vηg syllable form would contain the maximal two moraic constituents, predicting the absence of (C)VVηg forms.

The challenge of a bimoraic analysis of the (C)Vηg syllable form is to account for the failure of these syllables to pattern as heavy in the stress pattern. Since the moraic [η] does not contribute to the weight of the syllable for the purposes of stress, a distinction must be drawn between moras which dominate vowels and moras which dominate consonants. The nuclear moraic structure provides a structural means for doing this. Syllables which attract stress may be defined as those which have a branching nucleus. Since the mora dominating [η] is not dominated by the nucleus, the weight of the moraic [η] will not count for stress. This could be implemented by only footing syllables with branching nuclei[4]. If stress is then only potentially assigned to feet and primary stress is assigned to the head foot, the failure of both (C)Vηg syllables and light syllables to attract stress would be explained.

The failure of the bimoraic (C)Vηg syllable to be footed, due to the nonbranching nucleus in this structure is illustrated in (15).

[4]An initial foot will also probably have to be built in all cases, but I will set aside that question here.

(15) a. b.



Branching nuclei in all feet √ *

With the condition on foot constituency and the nuclear moraic structure, the mora dominating [η] can thus count towards the maximal moraic constituency of the syllable but not towards stress. Under this approach, constraints on Buriat syllable structure are respected in all forms. Yet this analysis comes at the cost of adding a node to the syllable, yielding a more complex theory. Furthermore, implementation of the condition on foot structure requires that this condition have access to the internal structure of the nucleus two levels below, as shown in (15). This approach consequently violates the Hierarchical Locality condition proposed by Itô & Mester (1992: 32), given in (16):

(16) A condition operating at prosodic level C_i has access only to structural information at C_i and at the subjacent level C_{i-1}.

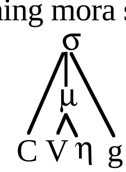
The additional node in the structure thus also leads to a less constrained theory of locality.

The alternative approach noted in section 1.2.1 of analyzing (C)Vηg syllables as monomoraic would require a structure for these syllables in which a nonmoraic [η] was appended under a syllable, mora or root node, yielding a branching structure in which no other nonmoraic consonant appeared. Consequently, such an approach would require that the (C)Vηg syllables violate some active constraint on Buriat syllable structure. In a derivational framework in which constraints are inviolable, it thus appears that the more complex nuclear moraic structure would be required to account for Buriat syllable structure in spite of its drawbacks. Significantly, the reduplication evidence that Shaw used to argue for the nuclear moraic structure has since been reanalyzed in OT by McCarthy & Prince (1993c) without a Nuc node. I will now argue that although the Buriat facts seem to require the nuclear moraic structure in a derivational approach, a simpler structure without the Nuc node is in fact sufficient in an OT framework, where constraints are violable.

2.2 The Branching Mora Structure

An alternative to the bimoraic nuclear mora analysis of (C)Vηg syllables is to analyze them as monomoraic with a branching mora structure, as shown in (17).

(17) Branching mora structure



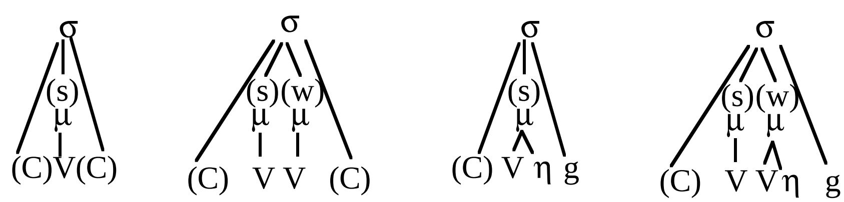
The monomoraic structure in (17) correctly predicts that (C)Vηg syllables will pattern with the light syllables with respect to stress. The branching mora structure analyzes the [η] in the cluster as dominated by the mora which also dominates the vowel, violating the constraint in Buriat against branching moras: *BRANCH μ. Thus, this approach demands a theory of violable constraints--an optimality theoretic framework.

Before considering what dominating constraints would force a violation of *BRANCH μ, I will address the important question of how the illformedness of (C)VVηg forms can be accounted for under the branching mora structure. I suggest that the absence of these forms falls out as a consequence of well-motivated assumptions concerning heads and their complexity in relation to nonheads. Since the first or leftmost mora in a syllable is the stronger element in terms of being more sonorous and less susceptible to deletion, I assume that it is the head. Now in the (C)Vηg syllables, the head mora branches. However, in a (C)VVηg syllable, it is the nonhead mora which would branch, so the structure would have a nonhead with greater complexity than the head.

The notion of head prominence is well-established in linguistic theory. One aspect of prominence is structure--head prominence requires that a head have at least as much structure as nonhead material (for discussion see Dresher & van der Hulst 1993). Since branchingness is a form of structural prominence, head prominence would not be obeyed if a nonhead was branching and the head was not. Accordingly, I suggest that the branching mora constraint is in fact two constraints:*BRANCH (S)μ and *BRANCH (W)μ, where (S)μ represents a strong or head mora and (W)μ represents a weak or nonhead one. Due to the principle of head prominence, these two constraints will be universally ranked such that *BRANCH (W)μ dominates *BRANCH (S)μ. Since (C)Vηg violates *BRANCH (S)μ and (C)VVηg violates the higher ranked *BRANCH (W)μ, I suggest that (C)VVηg syllables are excluded in Buriat by a superordinate ranking of *BRANCH (W)μ for this language. Under this analysis then, forms in which the head mora is less prominent in structure than the nonhead mora are ruled out.

Since the *BRANCH μ constraints are conditions on head and nonhead moras, they hold at the level of the syllable, where the head mora is established. This condition at the level of the syllable obeys the Hierarchical Locality condition, as it accesses only the moras and the immediate internal structure of the moras in the syllable. This access is illustrated in (18)[5]:

(18) a. b. c. d.



By referring to the immediate constituency of moras, it will be determined that neither (18a) nor (18b) violates *BRANCH μ, (18c) violates *BRANCH (S)μ and (18d) violates *BRANCH (W)μ. Since (C)Vηg violates *BRANCH (S)μ, this is the constraint which must be ranked below the constraints violated by competing structures. As *BRANCH (W)μ has superordinate ranking and is thus inviolable in Buriat, (C)VVηg will be blocked from ever appearing[6].

I conclude that with the notions of headedness and head prominence, the branching mora analysis can explain the patterning of (C)Vηg syllables in Buriat while preserving the simpler moraic constituency model without a Nuc node. A summary of the key points of this analysis is given in (19).

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[5]Note that in (18), (s) and (w) do not constitute nodes in the structure and are shown simply for ease of identification of head and nonhead moras.

[6]Note that an alternative parse for (18d) in which both vowels are under the strong mora and [η] is under the weak mora is not viable, as it violates the constraint requiring that all moras be associated to some vowel, which has superordinate ranking in Buriat.

(19) Summary for branching mora structure analysis
(i) (C)Vηg is monomoraic, correctly predicting its failure to attract stress.
(ii) *BRANCH (S)μ is a violable constraint universally dominated by *BRANCH (W)μ.
(iii) Superordinate ranking of *BRANCH (W)μ explains absence of (C)VVηg.
(iv) Constraints obey the Hierarchical Locality condition.

I will now briefly examine the constraint rankings required in order for the branching mora structure to be chosen as optimal. Since this structure violates the *BRANCH (S)μ constraint, this constraint must be ranked below each of the constraints violated by competing candidates. In order to exclude a structure in which one of [η] or [g] in a (C)Vηg form was simply not parsed, PARSE^{seg} must be ranked above *BRANCH μ[7]. Structures in which [η] and [g] form a complex coda by both linking to the syllable node or ones in which they form a complex segment will violate the complex margin constraints and thus, can be ruled out by domination of *BRANCH (S)μ by *COMPLEX^{coda} and *COMPLEX^{seg}. I will interpret *COMPLEX^{coda} as being violated when there are two or more consonants at the right edge of a syllable which are not dominated by a vocalic mora. A structure in which [η] is moraic will thus also be ruled out by *COMPLEX^{coda}[8]. A structure with a moraic [η] will additionally violate the constraint requiring that all moras be associated to vowels. Note that the constraint ASSOC (μ, V) is not violated by the branching mora structure in (17), because this constraint requires that all moras be associated to some V. Once a mora has been associated to a vowel, this constraint is silent about any other segments to which the mora is associated. Furthermore, *BRANCH (S)μ and NO CODA will not interact, as under the formulation of NO CODA as an alignment constraint (McCarthy & Prince 1993b), NO CODA will be violated whenever there is a consonant at the right edge of a syllable, so violation of *BRANCH (S)μ will not serve to avoid a violation of *NO CODA.

The constraint ranking required for Buriat syllable structure under the branching mora analysis of (C)Vηg syllables is summarized in (20). Note that since the optimal form does not violate any of the constraints ranked above *BRANCH (S)μ, there is no evidence from the (C)Vηg form for any ranking between these higher ranked constraints.

[7] To focus on the issue at hand, I simply show the parse segment constraint as ranked above the branching mora constraint here. However, as per discussion in note 1, a more richly articulated parsing constraint would probably in fact rank just the parsing of dorsal segments over *BRANCH (S)μ and would rank the parsing of coronal and labial segments below this constraint.

[8] Alternatively, if there was reason to believe that a consonant appended under a vocalic mora should contribute to a complex coda, then *COMPLEX^{coda} could be broken down into sub-constraints against individual complex coda structures, which could be independently ranked.

(20) Constraint ranking in Buriat syllable structure:

Ranking	Comments
PARSE^{seg} >> *BRANCH (S)μ	Selects branching mora over failing to parse a segment.
*COMPLEX^{coda} >> *BRANCH (S)μ	Selects branching mora over complex coda structures: moraic [η] or linking [η] and [g] to σ.
*COMPLEX^{seg} >> *BRANCH (S)μ	Selects branching mora over complex segment structure.
*BRANCH (W)μ >> *BRANCH (S)μ	Universal ranking by principal of head prominence. *BRANCH (W)μ is never violated in Buriat, so it is accorded superordinate ranking.
ASSOC(μ, V), ASSOC(V, μ)	Never violated in Buriat, accorded superordinate ranking.
PARSE, FILL >> ONS	Optional onset (section 1.3).
PARSE, FILL >> NO CODA	Optional coda (section 1.3).

The way in which these rankings select the optimal form for a (C)Vηg syllable over its plausible competitors is illustrated by the summary tableau in (21):

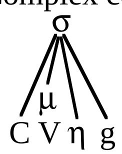
(21) Summary Tableau (showing constraints relevant to [Vηg] syllabification only):

<table>
<tr><th>/saηg/</th><th>*BRANCH (W)μ
*COMPLEX^{coda}
*COMPLEX^{seg}
PARSE^{seg}</th><th>*BRANCH (S)μ</th></tr>
<tr><td>+ μ
/ \
(a) .s a η g.</td><td></td><td>*</td></tr>
<tr><td>μ
/ | \
(b) .s a η g.</td><td></td><td>**!</td></tr>
<tr><td>μ
|
(c) .s a η.<g></td><td>*! PARSE^{seg}</td><td></td></tr>
<tr><td>μ μ
| |
(d) .s a η g.</td><td>*! COMPLEX^{coda}</td><td></td></tr>
<tr><td>μ
|
(e) .s a η g.</td><td>*! COMPLEX^{coda}</td><td></td></tr>
<tr><td>μ
|
(f) .s a ^{η}g</td><td>*! COMPLEX^{seg}</td><td></td></tr>
<tr><td>μ μ
| / \
(g) .s a η g.</td><td>*(!) BRANCH (W)μ
*(!) COMPLEX^{coda}</td><td></td></tr>
</table>

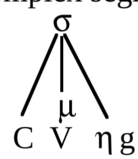
2.3 Complex Margin Structures

In the discussion in the preceding section I have assumed that the prohibition on complex codas and complex segments holds of all Buriat syllable structure. However, it is conceivable that one of these monomoraic complex margin structures occurs for (C)Vηg syllables. The two possible structures are illustrated below:

(22) a. Complex coda



b. Complex segment



I submit that neither of the structures in (22) are viable analyses of (C)Vηg syllable structure. In both of these structures, the moraic constituency of a (C)Vηg syllable is in no way different from that of a light syllable, so they offer no explanation of why another moraic constituent cannot be added. Accordingly, I conclude that (22a) and (22b) may be ruled out as they fail to explain the illformedness of (C)VVηg[9]. Since (22a-b) do not appear to be viable, I suggest that they are excluded by an undominated ranking of *COMPLEX^{coda} and *COMPLEX^{seg}, as proposed in the branching mora analysis.

3 Conclusions

In the preceding discussion we have seen that the nuclear moraic analysis requires the addition of more structure in the form of the Nuc node, weakening the restrictiveness of the theory. In contrast, the branching mora analysis preserves a simpler moraic syllable structure without a Nuc node and instead appeals to the notions of headedness, branchingness, and head prominence, which have independent motivation in linguistic theory. In fact, the nuclear moraic analysis must appeal to these notions as well. For example, in the nuclear moraic analysis a motivation behind the Nuc node is that it defines the head of the syllable, and foot structure and stress assignment must make reference to the branchingness of this head. In this discussion, we have further seen that a condition on foot structure in the nuclear moraic analysis must refer to moraic structure, which fails to obey Hierarchical Locality, while the *BRANCH (S)/(W)μ constraints required by the branching mora analysis do obey this locality condition. Accordingly, I conclude that the branching mora analysis is clearly the superior of the two. The fact that the branching mora structure is better able to account for Buriat syllable forms is an interesting result, because it shows that the presence of a Nuc node does not simplify an analysis of the distinction between maximal constituency and weight. It is only the less elaborated branching mora structure that is able to account for the maximal constituency effect of (C)Vηg syllables, while still simply counting all moras towards weight for stress.

The branching mora analysis offers an explanatory account of the facts of Buriat syllable structure, because in addition to accounting for the maximal constituency and weight of all syllable forms in Buriat, this analysis predicts the unique patterning for (C)Vηg syllables, as the requirement to parse the two final consonants forces a constraint violation for just this syllable type. This result thus provides an argument for optimality theory, which is based on the notion of ranked, violable constraints. This result also provides an argument for the basic syllable structures in (10). Under the branching mora

[9](22b) is also problematic because it makes predictions concerning the patterning of [ηg] clusters that are not borne out. (22b) analyses [ηg] as a complex segment, but these clusters actually pattern as if [ηg] had two separate root nodes. This becomes evident when a vowel-initial suffix is added to a root ending in [ηg]. In these forms, [η] and [g] are syllabified into separate syllables, such that [η] forms a coda and [g] forms an onset: compare [.aηg.] 'wild animals' and [.aη.gaar.] 'by means of game' (see Poppe 1960: 18). If [ηg] was in fact a complex segment, we would not expect the nasal and oral stop components to be split into separate syllables. Furthermore, there is evidence that nasal + consonant clusters as single segment contours should be universally discounted (see Padgett 1991 and references therein).

analysis, nonmoraic consonants are crucially only attached under mora nodes when forced by higher ranked constraints. I have demonstrated how this structure enables us to explain why syllables such as (C)Vηg in Buriat have maximal constituency without being heavy. This suggests that rather than simply linking all nonmoraic coda consonants under the final mora node, a weak layering model in which coda consonants link directly to the syllable node unless forced to do otherwise is in fact the appropriate structure.

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