MAINTAINING SIMPLICITY IN DOGRIB STEMS[1]

Aliki Marinakis

Department of Linguistics
University of Victoria, B.C., Canada

1. INTRODUCTION

Dogrib is an Athapaskan language of the Northeastern branch which is simplifying its phonological structure in a number of ways. One of the most evident ways the language does this is through eliminating or preventing the addition of syllables in certain domains. This paper addresses a number of vocalic suffixes in Dogrib, and how they attach to stem as examples of how prosodic simplicity is maintained in the stem domain of this language.

There are a number of vocalic suffixes in this language. All of them hold a monomoraic shape of a possible syllable, but are almost never realized as a separate syllable in the output. They therefore maintain their morphological identity, but alter the prosodic shape of the stem as little as possible. Examples of these suffixes are given in the data in (1), where the suffixed forms or derived forms, are given in column two. Only the diminutive suffix, seen in (1e), retains a separate syllable. All the others assimilate to the quality of the stem vowel.

(1)		Stem		Derived Form		Surface Shape	
a.	Nominalizing suffix	wedąį?ǫ	it is closed	wedąį?ǫǫ		bottle cap	-μ
b.	Locative suffix	tł'à	bay	tł'àa		beach	-μ̃
c.	Possessed noun suffix	yati	language	goyatìį		our language	-μ̀
d.	Adverbial suffix	nezį	good	nezįį		well, nicely	-μ̀
e.	Diminutive suffix:				neghoa	it is narrow	- a
		įhdǫǫ	kinnikinik berry	įhdǫa		little kinnikinik berry	(Saxon 1995)

The goals of this working paper are to examine these vowel initial, or vocalic suffixes in Dogrib—in particular, the nominalizing suffix, the possessed noun suffix and the diminutive suffix—and to offer an account of why they assimilate to the quality of the stem vowel. I propose there is a highly ranked constraint at work in the phonological grammar of Dogrib:

(2)   *STRUC (σ)   'no syllables'   (Zoll 1993, Prince & Smolensky 1993)

This constraint militates against the prosodic structure of a syllable and helps explain the behaviour of the vocalic suffixes in question, since they hold the input shape of a possible syllable, but are almost never realized as a separate syllable in the output. These suffixes avoid adding another syllable within the stem domain in the output by becoming incorporated into the stem. Thus they maintain their morphological identity but alter the prosodic shape of the stem as little as possible.

The diminutive suffix, which behaves differently and does not assimilate to the segmental value of the stem vowel, may be seen as counter evidence to an account that attributes assimilation to the high ranking of a constraint against syllable structure. However, the behaviour of this suffix can be accounted for through an appeal to the pure phonology of the language and the optimally sonorous quality of [a]. The generalization I seek to make is that the maximal sonority of the segment [a], and therefore the diminutive suffix [-a], is what ensures its realization. This

account captures this generalization through use of feature specific faithfulness constraints.

Apart from the introduction, this paper is organized into three sections: Section two provides some background and theoretical assumptions, section three offers constraints surrounding the realization of the nominalizing suffix and the possessed noun suffix. Section four will describe the diminutive suffix and offer a possible account of why it behaves differently than the other vocalic suffixes in the language.

2. BACKGROUND AND ASSUMPTIONS

2.1 Syllable structure

Dogrib syllables are optimally monomoraic, maximally bimoraic, and avoid codas. The only allowable coda in the language is [h], and it is not associated with a mora. Possible syllable shapes in the language are given in (3).

(3)   **cv**   **cvv**   **v**   **vv(h)**
         cv(h)   **cvv(h)**   **v(h)**

Historically, there were no phonologically long vowels in the language, and the long vowels which exist in Dogrib synchronically have been derived from what were historically two different syllables through morphological and phonological processes. A synchronic long vowel in the language consists of two moras.

The vowel inventory of Dogrib is given in (4), and illustrates that the language has nasal as well as oral vowels phonemically. Dogrib also has marked low tone.

(4)   Vowels

	front				**back**		
			un-rounded			rounded	
	non-nasal	nasal	non-nasal	nasal		non-nasal	nasal
high	i	į					
mid	e	ę				o	ǫ
low			a	ą			

Hiatus situations exist in this language, and when they do each vowel is a nucleus belonging to a separate syllable, like the forms in (5):

(5)   nàįdla   'it is torn'   **cv.v.cv**
         nàèhdli   'it is sewn'   **cv.vh.cv**   (MKR 2002)

Two vowels side by side with different qualities in Dogrib constitute two different syllables. They are pronounced as such. In many contexts, the language uses coalescence, assimilation, or gliding to resolve hiatus, and this resolution strategy subsequently also satisfies *STRUC (σ) since it decreases the number of syllables in a word.

2.2 The Dogrib Stem

Both noun and verb roots in Dogrib, like most Athapaskan languages are referred to as stems. Stems are morphologically required and provide a basic lexical meaning which is modified by the various prefixes, and usually only one is permitted per word. Besides the odd suffix, they are the final element in a Dogrib word. For the sake of this paper, the term 'stem' is used for both a root in the traditional sense as well as a root with suffixes attached. Synchronically stems in Dogrib consist of one syllable except for the odd noun stem which may be bisyllabic, it is this monosyllabic prosodic shape that is affected by the addition of the vocalic suffixes under discussion here.

2.3 Theoretical Assumptions

In order to express the form and nature of the constraint which effects structural simplification, I depend on the constraint driven Optimality Theory, which assumes that the output is selected by a set of constraints which are violable and ranked language-specifically in a hierarchy of relevance. Optimality Theory, developed by Prince and Smolensky (1993), assumes that a surface form of a language is "optimal" since it reflects the resolution of the competing demands of universal markedness constraints and universal faithfulness constraints. The markedness constraints guard against a surface form which is too marked cross-linguistically, and faithfulness constraints work to preserve lexical contrasts. The account presented in this paper also draws upon the tenants of Correspondence theory (McCarthy and Prince, 1995, 1999), such as the concept of contiguity, and Positional Faithfulness (Beckman 1998) which makes a distinction between phonologically privileged positions like stems and non-privileged positions like affixes. I also draw upon the traditional notion of a mora as a weight bearing unit.

The tendency in Dogrib to innovate towards simple prosodic structure in certain phonological domains leads to the crucial assumption that there is a family of highly ranked *STRUC markedness constraint active in the grammar. In this examination of the stem syllable and the vocalic suffixes, the constraint *STRUC (σ), defined above in (2), is the most relevant constraint within this family, and the one I make most use of in this paper.

3. THE VOCALIC SUFFIXES

3.1 The Nominalizing Suffix

3.1.1 Description

The nominalizing suffix is used very productively in Dogrib to form nouns, relative clauses and nominalizations (Saxon 1995). It holds the prosodic shape of a mora that attaches to the final vowel of the stem and manifests itself by lengthening that final vowel. As the forms in (6) show, the suffix mora takes on all the features associated with the stem vowel, except tone. The suffixed form is in column two, and the suffix is bolded and underlined.

(6)   tłį nakweè wheda   the dog is first   tłį nakweè whedaa   'lead dog'
      hodoòdzo s/he slides again and again   Hodoòdzoo   'Slide' (place name)
      łèt'èłekǫ   'the bread is sweet'   łèt'èłekǫǫ   'cake'
      whek'ò   'it is cold'   whek'òo   'fridge'
      ʔełech'àts'eeʔį   'we are hiding from   ʔełech'àts'eeʔįį   'hide-and-seek'
                         each other'   (Saxon 1995)

However, in special contexts of emphasis, on relative clauses and in unusual forms like that in (7), the suffix takes the form of [-i].

(7)   nechà   'it is big' nechàa ~ nechài   'the one which is big'   (*ibid*)

This form, in (7) is also the form this suffix takes in related languages of Slave and Dene Sųłiné (Chipewyan). I assume, therefore that the more marked [-i] shape of the suffix is actually the historical form, and that this shape is used in more specific morphological environments in order to preserve or emphasize its function.

I also assume that /-i/ is actually the shape and quality of the nominalizing suffix in the underlying form.

3.1.2. Account

The constraints determining the output form of this suffix must ensure some aspect of the morpheme is realized so the meaning is evident, but at the same time, the optimal output forms must conform to the prosodic well-formedness constraints. By losing its segmental value as it does in the majority of cases, as seen in the forms in (6), the nominalizing suffix does not fatally violate the constraint *STRUC (σ). The loss of its input value, however, does not necessarily interfere with its morphological identity, as the rest of this section will show. This account of the nominalizing suffix makes use of markedness constraints on syllable structure and faithfulness

constraints surrounding contiguity and input moras.

Morphologically specific alignment constraints are not necessary to ensure the suffixes attach to the right edge of the stem. Instead, a high ranking of the faithfulness constraint on moraic contiguity seen in (8) ensures that the position of the mora is consistent with the input.

(8)   **Contiguity**   The moras of S1 standing in correspondence form a contiguous string,
                                       as do the correspondent moras of S2

The tableau in (9) shows this correspondence with the word *whek'òo* 'fridge', and how the constraint Contiguity and the constraint *STRUC (σ) determine the shape and placement of the nominalizing suffix.

(9)   *whek'òo*   'fridge'

whek'ò + [nom-i]	*STRUC (σ)	Contiguity
☞ a. whek'òo	**	
b. wheek'ò	**	*!
c. whek'òi	***!	

The other constraints active in determining the shape of *whek'ò* + [nom-i], are a prosodic constraint restricting the length of syllables, defined in (10), and a conflicting faithfulness constraint, seen in (11).

(10)   *[μμ]σ   'No bimoraic syllables'

A constraint against bimoraic syllables is justifiable cross linguistically, since in many other languages, besides Dogrib, **cv** is a less marked syllable than **cvv**. This constraint, however, must be ranked quite low since it is violated by all optimal forms containing the vocalic suffixes. Max–μ, in (11), ensures the realization of morphemes by discouraging the deletion of moras.

(11)   **Max-μ**   'Every mora in the input must be maximized in the output'

The tableau in (12) demonstrates how this faithfulness constraint must be ranked higher than the prosodic markedness constraint against bimoraic syllables in order to derive the optimal candidate seen in (12a.).

(12)   *whek'òo*   'fridge'

whek'ò + [nom-i]	Max -μ	*[μμ]σ
☞ a. whek'òo		*
b. whek'ò	*!	

The brief account developed so far in this section has established constraints on syllable structure, contiguity and moraic faithfulness which can explain why the nominalizing suffix does not usually create a new syllable when it attaches to the stem syllable. However, in order to account for why it is the suffix vowel that assimilates to the stem vowel in the case of this suffix, rather than the stem vowel assimilating to the suffix, I turn to the principles of Positional Faithfulness. According to this theory, there is a cross-linguistic tendency for high ranking faithfulness constraints surrounding privileged positions such as roots, and especially root-initial syllables. Affixes belong to the category of non-privileged positions (Beckman 1998). Therefore it follows that the vowel quality of an affix such as a nominalizing suffix is less likely to be retained than the vowel quality of a stem or root initial syllable. Of course, this generalization applies to the other suffixes discussed in this paper as well.

3.2   The Possessed Noun and Adverbial Suffixes

3.2.1   Description

The possessed noun suffix, also referred to by Saxon as *the suffix for described nouns*, has the same output shape as the adverbial suffix. The adverbial suffix derives adverbs from nouns and verbs in Dogrib and the possessed noun suffix is used when a noun has a descriptive word or phrase with it, or when possessed (Saxon 1995).

Both suffixes hold the shape of a mora with low tone and undergo the same processes of assimilation as the nominalizing suffix, seen above. For the sake of brevity, however, this section focuses on the possessed noun suffix as the representative of the two, and so does not address the adverbial suffix further. Forms exemplifying the suffix can be seen below in (13). The suffixed forms are given in the second column and the suffixes themselves are bolded.

(13)   a.   yati   'language'   goyatiì   'our language'

          b.   sǫǫ̀mba   'money'   gisǫǫ̀mbaà   'their money'

          c.   dechį   'stick'   wedechįį   'its stick'

          d.   beh   'knife'   sebeè   'my knife'

          e.   choh   'down, feathers'   wechoò   'its down'   (Saxon 1995)

Despite the fact that the possessed noun suffix has a historical shape of [-è], and in the neighbouring languages of Slave and Dene Sųłiné the suffix still retains this value in many contexts, I do not project any specification for the quality of this suffix in the input. I assume the input shape is [-μ̀] since this suffix, unlike the nominalizing suffix, never surfaces with the specific quality of [-è] unless that is the quality of the stem vowel. Both the possessed noun suffix, and the adverbial suffix just link to the segmental and nasal features of the stem vowel when they attach to a stem. It is important to note than none of the suffixes take on the tone value of the stem vowel, but they all take on the nasal value of the stem.[2]

3.2.2. Account

As the data in (13) indicates, the possessed noun suffix behaves like the nominal suffix in the way that it creates a long vowel in the stem syllable by assimilating to the quality of the stem vowel. Two forms stand out however-- those seen in (13d-e). These forms have a coda in the input stem shape, but once the suffix is attached, the coda is no longer realized. This is the case if any of the vocalic suffixes attach to a stem with a coda. In all cases, the coda is dropped and the suffix attaches to the stem vowel. Because the stem syllables of these two forms have [h] codas, we might expect blocking of the assimilation to occur, but clearly this does not happen. If this coda were retained, when a vocalic suffix is attached, resyllablification would have to occur, like it does in the neighbouring language of Slave (see Rice 1989). The coda is not retained, however, and resyllabification does not occur, so the stem remains one syllable even with the suffix attached. This maintenance of a single syllable stem shape even with an intervening underlying coda can be seen as further evidence for the highly ranked *STRUC (σ) constraint. It could also be evidence, however, for a constraint against [h] onsets in the language, like that in (14).

(14)   ***[h] onsets**   'no [h] onsets'

Such a constraint as this is motivated cross-linguistically, as well as within the phonological distribution of [h] in Dogrib. Although the segment [h] is occasionally heard phonetically in onset position, phonologically it is not an allowable onset in the language.

Two markedness constraints surrounding syllable structure have thus been introduced, so a general segmental faithfulness constraint is also needed to create resistance to these constraints. Such a constraint in the grammar would protect the value of consonants, which, in Dogrib, are never moraic, as well as vowels. For this purpose, I propose the faithfulness constraint in (15).

(15)   **Max–seg**   'Every *segment* in the input has a correspondent in the output'

However, as the tableau in (16) shows, the violation of this constraint is not fatal when the other output option involves adding a syllable to the output. Once again, according to this account, the constraint *STRUC (σ) prevents the realization of the suffix as an extra syllable in the stem.

---

[2] This is the case unless the vocalic suffix itself has a nasal quality, like in the case of the locative suffix which is realized as a nasalized mora. In that case the nasality spreads to the stem vowel (see fig.1).

(16)   *wechoò* 'its down'

we+choh + [poss-è]	*STRUC (σ)	Max–seg	*[μμ]σ
☞ a. wechoò	**	*	*
b. wechohè	***!		
c. wechoè	***!	*	

The other constraint relevant to these forms is the syllable structure constraint against long vowels, also ranked below *STRUC (σ), however this tableau does not establish a crucial ranking between *[μμ]σ (no long vowel) and Max–seg (maximize segment).

The presence of tone in these suffixes brings to light the necessity of a constraint that ensures the realization of underlying tone in the language, and in particular in the realization of the vocalic suffixes.   Max Tone, defined in (17), is therefore necessary to maintain the tonal quality of the morphemes in the output.

(17)   Max-Tone   'Ever instance of tone in the input must be maximized in the output'

The realization of tone is necessary for the purpose of morphological contrast.   Many words in Dogrib are differentiated only by tone.   The possessed noun suffix maintains its tonal value even when it assimilates to the quality and nasality of the stem vowel.   It must maintain its low tone in order to be distinguished from the nominalizing suffix.   However, a syllable with two tone values is a marked syllable in Dogrib, so, therefore, I propose a conflicting constraint in (18).

(18)   *[$V_{T1}V_{T2}$]σ   'Consistency of tone within a syllable'

This constraint militates against two different tonal values within one syllable.   Another prosodic markedness constraint is relevant here as well—one which ensures a nasal feature in a stem is spread to the suffix. So, the constraint in (19) ensures nasal spreading within a syllable.

(19)   *[$V_{N1}V_{N2}$]σ   'Consistency of nasal features within a syllable'

But, due to its high ranking, when there is a difference in tone and/or nasality the ubiquitous *STRUC (σ) constraint prevents the constraints in (18) and (19) from creating a new syllable.   It must be noted that tone is associated to a mora in this language, and so in a bimoraic syllable there may be two tones—one associated with each mora of the syllable.   In Dogrib, the only marked tone is low tone.   The contrasting high tone is unmarked.

The tableau in (20) shows how Max-tone must be ranked higher than the prosodic consistency constraint, in order to preserve the morphological identity of the suffix.

(20)   *wedechįį* 'its stick'

we+dechį + [poss-μ̀]	Max–tone	*[$V_{N1}V_{N2}$]σ	*[$V_{T1}V_{T2}$]σ
☞ a. wedechįį			*
b. wedechįį	*!		
c. wedechįi	*!	*	*
d. wedechįi		*!	*
e. wedechį	*!		

This tableau in (20) also indicates that consistency of nasality within a syllable is more important than consistency in tonal value, according to the grammar of the language.   This is evident in the output forms of stems syllables with suffixes incorporated into them, since, as previously mentioned, these vocalic suffixes always assimilate to the nasal value of the stem, but never the tonal value.

Now, in order to see how these constraints rank in relation to the other constraints introduced so far, we

look at the tableau in (21) which evaluates possible outputs for the word *gisǫǫ̀mbaà* 'their money'. *STRUC(σ) prevents the realization of the possessed noun suffix with a specific quality, but Max-tone and Max-μ ensure the morpheme itself is realized. The optimal candidate, (21a) is the one which violates the lower ranked prosodic markedness constraints the most times and the *STRUC (σ) constraint the fewest times.

(21)   *gisǫǫ̀mbaà* 'their money'

gi+ sǫǫ̀mba+ [poss-è]	*STRUC (σ)	Max–tone	Max-μ	*[VT₁VT₂]σ	*[μμ]σ
☞ a. gisǫǫ̀mbaà	***			**	**
b. gisǫǫ̀mbaè	****!			*	*
c. gisǫǫ̀mba	***	*!	*	*	*
d. gisǫǫ̀mbaa	***	*!		*	**

    The next section will build on this analysis, and these constraints already established to account for the problematic diminutive suffix as well as some morphologically complex forms where more than one suffix is added to a stem.

3.3   The Diminutive suffix

3.3.1   Description

    The diminutive suffix in Dogrib is very productive, and is used to emphasize the smallness or preciousness of something (Saxon 1995). As the forms in (22) show, it is clear this suffix does not incorporate into the stem syllable the way the suffixes discussed above do.

(22)	a.	di	'island'	dia	'small island'
	b.	łè	'flour, powder'	łèa	'powder'
	c.	nezį̀	'be good'	nezįą̀	'it is kind of nice'
	d.	kǫ̀	'house'	kǫ̀ą	'room, shack'
	e.	deh	'river'	dea	'creek'
	f.	beh	'knife'	bea	'small knife' (Saxon 1995)

    The diminutive does behave like the other suffixes in the way that the coda of a stem is lost with the addition of it, like in (22e-f), and it takes on the nasality of the stem vowel, like we see in (22c-d). But because it still creates a new syllable, it still violates *STRUC (σ) more frequently than the other vocalic suffixes. This suffix, therefore, appears to be an important piece of counter evidence to my hypothesis of stem simplicity, and the highly ranked *STRUC (σ) which motivates the suffixes to incorporate into the stem. The diminutive does not incorporate, nor does it spread its quality regressively to the stem vowel.

    Rather than seeing this suffix as counter evidence, however, I propose segment-specific faithfulness constraint which allows the diminutive suffix to be accounted for easily, even in the face of the *STRUC (σ).

3.3.2   Account

    Why then does the Dogrib diminutive suffix act so differently from the other vocalic suffixes and not assimilate into the stem despite the high-ranked *STRUC (σ) constraint? In her work on assimilation patterns in Dogrib, Trisha Causley notes that the Dogrib segment [a] does not assimilate in any context (1995). Based on this fact, I make the claim that the vowel [a] has special status in assimilation processes. I suggest that it is the underlying quality of the vowel that impedes its incorporation into the stem, rather than a constraint on the particular morphological identity of the diminutive suffix. The analysis I present here makes use of a segment-specific faithfulness constraints and follows from my account of the other vocalic suffixes, above.

    Causley attributes only one feature to each vowel within the Dogrib vowel inventory, since only one feature is needed to mark each vowel and thus distinguish them from each other. The unmarked vowel in the language is

[e], and so Causley does not attribute it with any distinguishing features in the UR:

(24)   i – [high]   a – [low]

                  e – []   o – [back]   (Causley 1995)

Despite the fact that [e] is the underspecified vowel, and the least marked vowel in Dogrib, but the vowel [a] retains special status in the language as well, due to its sonority.   In order to ensure the realization of the low vowel over the realization of the other vowels, then, I project a simple faithfulness constraint, in (25) that allows the sonority of [a] to be maximized in the output.

(25)   Max [low]   'Every low segment in the input is maximized in the output'

The motivation behind such a constraint being so high ranked in comparison to *other* identity constraints on vowel features comes from the sonority hierarchy in which low vowels are the most sonorous (Prince & Smolensky 1993). Cross-linguistically, then, [a] is also recognized as the most sonorous vowel, as well as within the Dogrib vowel inventory.   The constraint in (25) is relevant to both the segment [a] and the diminutive suffix [-a].

This segment-specific faithfulness constraint, must be more highly ranked than the other feature maximizing constraints in order to preserve the identity of this specific suffix in the face of *STRUC (σ).   But another constraint protecting the integrity of the stem vowel is also necessary.   In order for candidate a. to emerge with its root intact, in the tableau in (27) a distinction must be made between stem faithfulness and affix faithfulness. The assumption in (26) is necessary to explain the protection of vowel identity of stems, and is exemplified in the tableau in (27).

(26)   Max-root   >>   Max IO

(27)   *dia* 'small island'

di+ [dim-a]	Max-[a]	Max-seg-root	*STRUC (σ)
☞ a. dia			**
b. dii	*!		*
c. daa		*!	*
d. di	*!		*

The new faithfulness constraint protecting roots protects the stem vowel from being assimilated by the suffix vowel.   With this assumption in (26), then, and the constraint protecting the quality of [a] ranked more highly than the constraint against syllable structure, the correct output candidate for the word *dia* 'small island' is selected.

The other piece of data that should be looked at with regards to the diminutive is the disappearance of the [h] coda in the stem.   In the data in (22e-f) the [h] coda is not realized when the diminutive suffix is added, despite the face that a syllable is still being created, and despite the fact that it is a root segment.   The tableau in (28), with the input *dea* 'creek', shows how the constraints established so far are still able to select the correct output form.

(28)   *dea* 'creek'

deh+ [dim-a]	Max-[a]	*[h] onset	Max-seg-root	*STRUC (σ)	Max-µ	Max-Seg
☞ a. dea			*	**		
b. dee	*!			*		*
e. daa			**!	*		*
d. de	*!		*	*	*	*
e. deha		*!		**		

A test of whether these new faithfulness constraints are effective in selecting the correct output must also

include the suffixes previously discussed. The relevant segment-specific faithfulness constraints protecting the quality of the other Dogrib vowels are therefore ranked in (29):

(29)   **Max [a] >> Max [i]**
              Max [a] >> Max [o]

The tableau in (30) indicates that this ranking can account for other suffixed forms too, like *łèt'è łekǫǫ* 'cake', which has the nominalizing suffix attached.

(30)   *łèt'è łekǫǫ* 'cake'

łèt'è łekǫ + [nom-i]	Max-seg-root	*STRUC (σ)	Max-μ	Max- [i]	Max- [o]	Max-Seg
☞ a. łèt'è łekǫǫ		****		*		*
b. łèt'è łekǫi		*****!				
c. łèt'è łekįi	*!	****			*	*
e. łèt'è łekǫį		*****!				
f. łèt'è łekǫ		****	*!	*		*

This tableau in (30) demonstrates that the vowel identity constraints do not affect the realization of the nominalizing suffix, but the constraint on identity of the stem vowel is necessary here as well in order to ensure the retention of the stem vowel quality over that of the suffix vowel.

3.4   Morphologically complex forms

The last set of data this paper addresses are the morphologically complex forms given in (31). These forms show what happens in Dogrib when more than one suffix attaches to a stem, and how such a circumstance affects the realization of both the suffixes and the stem shape.

(31)   sekekw'ǫǫ̀   'my toes'   sekekw'ǫ̀ą   'my little toes'

              satsǫ̀xòo   'snare'   satsǫ̀xòa   'wire'

              ekw'ǫǫ̀   'bone'   ekw'ǫ̀ą   'dice'   (Saxon 1995)

The analysis of these forms builds on that of the suffixes discussed above, but makes the addition of one more prosodic markedness constraint—one which prevents the realization of three mora in a row, like that in (32).

(32)   ***3μ**   ' no trimoraic syllables'   (Kager 1999, 268)

I would like to add a further restrictive quality to this constraint, though, one which would not allow three moraic segments to exist in a string without a consonant, whether or not they are in a syllable.   With this new addition, the constraint ranking in tableau (33) is able to select the correct candidate.   The ranking between the highly ranked markedness constraint, in (32) and the two highly ranked faithfulness constraints remains unestablished.

(33)   *sekekw'ǫ̀ą* 'my little toes'

sekekw'ǫ [poss -μ]+ [dim-a]	*3μ	Max-[a]	Max-seg-root	* STRUC (σ)	Max-μ
☞ a. sekekw'ǫ̀ą				****	*
b. sekekw'ǫǫ̀ą	*!			****	
c. sekekw'ǫ̀ąą	*!			****	
d. sekekw'ǫǫ̀		*!		***	*
e. sekekw'ąą̀			*!	***	*

4.   CONCLUSION

The optimal mono-syllabic stem shape of the language is maintained even when a vocalic suffix is added to a stem in Dogrib, except in the case of the diminutive suffix.   According to the account presented in this paper, the maintenance of simplicity in Dogrib stems is driven largely by the highly ranked constraint against syllable structure in the language.   The high ranking of this constraint in the grammar is the reason the vocalic suffixes are not realized with a segmental value, and the even higher ranking of Max-[a] is the reason the diminutive suffix retains its segmental value.   The motivation behind the higher ranking of Max-[a] than of Max-[i] and Max-[o] comes from the nature of the segment [a] itself, since it is the most sonorous vowel of the inventory.

REFERENCES

Ackroyd, Lynda. (1982). Dogrib Grammar. University of Toronto. ms.

Beckman, Jill. (1998). Positional Faithfulness. University of Massachusetts, Amherst, Doctorial dissertation.

Causley, Trisha. (1995). Vowel Assimilation in Dogrib. Presented at the Athapaskan Morpho-syntax workshop. UNM.

Causley, Trisha. (1998). Faithfulness and Contrast: the problem of Coalescence. WCCFL 17. 451-465.

Dene K'ę́ę́ T'ahsú Ts'uuzi Gha Edjhtł'éh, nadaatł'éh. (South Slave Topical Dictionary, second addition.) (1993). Teaching and Learning Centre Dehcho Divisional Board of Education: Fort Simpson, NWT.

Elford, Leon W. & Marjorie Elford (eds). (1998). Dene (Chipewyan) Dictionary. Northern Canadian Mission Distributors: Prince Albert, SK.

Hargus, Sharon. (1995). Interaction of Phonology and Morphology in Athapaskan Languages. University of Washington. m.s.

Hargus, Sharon and Siri Tuttle. (1997). Augmentation as Affixation in Athapaskan Languages. Phonology 14. 177-220.

Howren, Robert. (1979). Phonology of Rae Dogrib. Contributions to Canadian Linguistics. National Museum of Canada: Ottawa.   7-40.

Kager, Rene. (1999). Optimality Theory. Cambridge University Press: Cambridge.

McCarthy, John and Alan Prince. (1994). The emergence of the unmarked: Optimality in Prosodic Morphology. M.Gonzalez (ed.), Proceedings of the North-East Linguistics Society 24. 177-79.

Prince, Alan, and Paul Smolensky. (1993). Optimality Theory: constraint interactions in generative grammar.   m.s. Rutgers University, New Brunswick and University of Colorado, Boulder.

Rice, Keren. (1989a). A Grammar of Slave. Mouton de Gruyter: New York.

Rice, Keren. (1989b). Vowel Initial Suffixes and Clitics in Slave. In Theoretical Perspectives on Native American Languages. Donna Gerdts and Karin Michelson (Eds.) State University of New York Press: New York. 104-132.

Saxon, Leslie. (1995). Some Vocalic Suffixes in Dogrib. Presented at the Athapaskan Language Conference. University of New Mexico, Albequerque.

Saxon, Leslie. (1979). Proto-Northeastern Athapaskan stem final Consonants. University of Toronto. m.s.

Saxon, Leslie and Mary Siemens (eds). (1996). *Tłįchǫ Yatìi Enįhtł'è: A Dogrib Dictionary.* Dogrib   Divisional Board of Education: Dettah, Rae-Edzo, Rae Lakes, Snare Lake, Wha Ti.

Zoll, Cheryl. (1993). Ghost Segments and Optimality. WCCFL 12. 117-132.

include the suffixes previously discussed. The relevant segment-specific faithfulness constraints protecting the quality of the other Dogrib vowels are therefore ranked in (29):

(29)   **Max [a] >> Max [i]**
             Max [a] >> Max [o]

The tableau in (30) indicates that this ranking can account for other suffixed forms too, like *ɬèt'è ɬekǫǫ* 'cake', which has the nominalizing suffix attached.

(30)   *ɬèt'è ɬekǫǫ*   'cake'

ɬèt'è ɬekǫ + [nom-i]	Max-seg-root	*STRUC (σ)	Max-μ	Max- [i]	Max- [o]	Max-Seg
☞ a. ɬèt'è ɬekǫǫ		****		*		*
b. ɬèt'è ɬekǫi		*****!				
c. ɬèt'è ɬekįi	*!	****			*	*
e. ɬèt'è ɬekǫį		*****!				
f. ɬèt'è ɬekǫ		****	*!	*		*

This tableau in (30) demonstrates that the vowel identity constraints do not affect the realization of the nominalizing suffix, but the constraint on identity of the stem vowel is necessary here as well in order to ensure the retention of the stem vowel quality over that of the suffix vowel.

3.4   Morphologically complex forms

The last set of data this paper addresses are the morphologically complex forms given in (31). These forms show what happens in Dogrib when more than one suffix attaches to a stem, and how such a circumstance affects the realization of both the suffixes and the stem shape.

(31)   sekekw'ǫǫ̀   'my toes'   sekekw'ǫ̀a   'my little toes'
             satsǫ̀xòo   'snare'   satsǫ̀xòa   'wire'
             ekw'ǫǫ̀   'bone'   ekw'ǫ̀a   'dice'   (Saxon 1995)

The analysis of these forms builds on that of the suffixes discussed above, but makes the addition of one more prosodic markedness constraint—one which prevents the realization of three mora in a row, like that in (32).

(32)   ***3μ**   ' no trimoraic syllables'   (Kager 1999, 268)

I would like to add a further restrictive quality to this constraint, though, one which would not allow three moraic segments to exist in a string without a consonant, whether or not they are in a syllable. With this new addition, the constraint ranking in tableau (33) is able to select the correct candidate. The ranking between the highly ranked markedness constraint, in (32) and the two highly ranked faithfulness constraints remains unestablished.

(33)   *sekekw'ǫ̀a* 'my little toes'

sekekw'ǫ [poss -μ̀]+ [dim-a]	*3μ	Max-[a]	Max-seg-root	* STRUC (σ)	Max-μ
☞ a. sekekw'ǫ̀a				****	*
b. sekekw'ǫǫ̀a	*!			****	
c. sekekw'ǫàa	*!			****	
d. sekekw'ǫǫ̀		*!		***	*
e. sekekw'aà			*!	***	*

4.   CONCLUSION

The optimal mono-syllabic stem shape of the language is maintained even when a vocalic suffix is added to a stem in Dogrib, except in the case of the diminutive suffix.   According to the account presented in this paper, the maintenance of simplicity in Dogrib stems is driven largely by the highly ranked constraint against syllable structure in the language.   The high ranking of this constraint in the grammar is the reason the vocalic suffixes are not realized with a segmental value, and the even higher ranking of Max-[a] is the reason the diminutive suffix retains its segmental value.   The motivation behind the higher ranking of Max-[a] than of Max-[i] and Max-[o] comes from the nature of the segment [a] itself, since it is the most sonorous vowel of the inventory.

REFERENCES

Ackroyd, Lynda. (1982). Dogrib Grammar. University of Toronto. ms.

Beckman, Jill. (1998). Positional Faithfulness. University of Massachusetts, Amherst, Doctorial dissertation.

Causley, Trisha. (1995). Vowel Assimilation in Dogrib. Presented at the Athapaskan Morpho-syntax workshop. UNM.

Causley, Trisha. (1998). Faithfulness and Contrast: the problem of Coalescence. WCCFL 17. 451-465.

Dène K'ę́ę́ T'ahsú Ts'uuzi Gha Edįhtł'éh, nadaatł'éh. (South Slave Topical Dictionary, second addition.) (1993). Teaching and Learning Centre Dehcho Divisional Board of Education: Fort Simpson, NWT.

Elford, Leon W. & Marjorie Elford (eds). (1998). Dene (Chipewyan) Dictionary. Northern Canadian Mission Distributors: Prince Albert, SK.

Hargus, Sharon. (1995). Interaction of Phonology and Morphology in Athapaskan Languages. University of Washington. m.s.

Hargus, Sharon and Siri Tuttle. (1997). Augmentation as Affixation in Athapaskan Languages. Phonology 14. 177-220.

Howren, Robert. (1979). Phonology of Rae Dogrib. Contributions to Canadian Linguistics. National Museum of Canada: Ottawa.   7-40.

Kager, Rene. (1999). Optimality Theory. Cambridge University Press: Cambridge.

McCarthy, John and Alan Prince. (1994). The emergence of the unmarked: Optimality in Prosodic Morphology. M.Gonzalez (ed.), Proceedings of the North-East Linguistics Society 24. 177-79.

Prince, Alan, and Paul Smolensky. (1993). Optimality Theory: constraint interactions in generative grammar.   m.s. Rutgers University, New Brunswick and University of Colorado, Boulder.

Rice, Keren. (1989a). A Grammar of Slave. Mouton de Gruyter: New York.

Rice, Keren. (1989b). Vowel Initial Suffixes and Clitics in Slave. In Theoretical Perspectives on Native American Languages. Donna Gerdts and Karin Michelson (Eds.) State University of New York Press: New York. 104-132.

Saxon, Leslie. (1995). Some Vocalic Suffixes in Dogrib. Presented at the Athapaskan Language Conference. University of New Mexico, Albequerque.

Saxon, Leslie. (1979). Proto-Northeastern Athapaskan stem final Consonants. University of Toronto. m.s.

Saxon, Leslie and Mary Siemens (eds). (1996). *Tłįchǫ Yatiì Enįhtł'è: A Dogrib Dictionary*. Dogrib   Divisional Board of Education: Dettah, Rae-Edzo, Rae Lakes, Snare Lake, Wha Ti.

Zoll, Cheryl. (1993). Ghost Segments and Optimality. WCCFL 12. 117-132.