REDUPLICATION IN NISGHA

by

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ABSTRACT

Nisgha exhibits diverse reduplication types, each type displaying consonant and vowel variation. This thesis investigates the phonological properties of these reduplication types and accounts for them in an autosegmental framework. In particular, the reduplication types are examined in Marantz's framework, as presented in "Re Reduplication" (1982).

In accordance with Marantz's principles, this thesis represents Nisgha reduplication as the affixation of a skeletal morpheme to which a copy of the phonemic melody is associated. Certain reduplication types are problematic for this approach, and for these, an alternative approach is discussed.

In general, the thesis covers (i) a brief description of Nisgha phonology (ii) a descriptive account of reduplication types and the relevant rules (iii) a comparison with the analysis of Tarpent (1983) (iv) an autosegmental treatment of reduplication, using Marantz's framework.

Two reduplication types present a problem for Marantz. One of these types can be handled by abandoning Marantz's C-V skeleton and employing instead a skeletal tier consisting of empty sequential points, as proposed by Lowenstamm and Kaye (1983). For the second reduplication type, various approaches are suggested, none of which is without its problems. In fact, this type proves to be

problematic not only to Marantz but to autosegmental theory as a whole.

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INTRODUCTION

Nisgha, a member of the Tsimshian language family, is spoken along the Nass River in Northern British Columbia. The analysis presented in this paper is based on a body of language data elicited from native speakers[1] of Nisgha from the areas of Greenville, Canyon City and Aiyansh. In addition, some data were collected from a speaker from Kincolith, and these data were used mainly for comparative purposes.

Reduplication in Nisgha is a widespread phenomenon and manifests itself according to diverse patterns. This thesis will investigate the phonological properties of these patterns and propose a more integrated account of them in an autosegmental framework. The format of the thesis will be as follows. The first three chapters, which will be largely descriptive will offer

(i) a phonological outline of Nisgha,

(ii) a presentation of the reduplication types and rules accounting for them,

(iii) a comparison with the analysis given in Tarpent (1983).

The fourth chapter will offer a theoretical treatment of Nisgha reduplication in an autosegmental framework. Let us now look at an outline of Nisgha phonological processes which will prove to be relevant to reduplication.

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[1] See Acknowledgements.

I. OUTLINE OF NISGHA PHONOLOGY

A. PHONETIC INVENTORY:

The phonetic inventory of consonants is as follows:

Stops	p	t		k^y	k	k^w	q	q^w	ʔ
	p^h	t^h		k^{yh}	k^h	k^{wh}	q^h	q^{wh}	
	b	d		g^y	g	g^w	G	G^w	
Ejective	p'	t'		k^{y}'	k'	k^{w}'	q'	q^{w}'	
Affricates		ts	dz	dz^y(or dʒ)					
Eject. Affr.		ts'	tɬ'	tʃ'					
Fricatives		s	ɬ	x^y	x	x^w	χ	$χ^w$	h
							ɣ	$ɣ^w$	h̄
Resonants	m	n	l	y		w			
Glott. Res.	m̂	n̂	l'	ŷ		ŵ			
	m̥̂	n̥̂	l̥'	ŷ̥		ŵ̥			

For the most part, the distribution of consonants in the phonetic inventory seems quite symmetrical. With respect to the plain stops, there is uniformity of voiced and voiceless counterparts at the various points of articulation. In the case of the fricatives, there is an apparent imbalance with respect to voicing – only the uvular and glottal fricatives have voiced realizations. It will later be shown that [ɣ] and [$ɣ^w$] are relatable not to their voiceless counterparts but rather to the homorganic stop, and that [h̄]is relatable to /h/. Finally, the distribution of the resonants is entirely symmetrical, with both the glottalized and non-glottalized series occurring at the various points of articulation.

The following are the vowels that occur in the phonetic inventory of the language.

i(:)		u(:)
ɩ		ʊ
e(:)		o(:)
ϵ(:)	ə	ɔ(:)
æ(:)	a(:)	ɑ(:)

The vowels pattern uniformly, with both long and short vowels occurring throughout the vowel area. We will examine the range of pronunciation of these vowels when the phonemic status of the vowels is discussed.

B. PHONEMIC INVENTORY OF CONSONANTS

The consonants comprising the phonemic system of Nisgha are:

Stops	p	t			k^y	k^w	q	ʔ
Ejective Stops	p'	t'			k^{y}'	k^{w}'	q'	
Affricates			ts					
Eject. Affr.			ts'	tɬ'				
Fricatives			s	ɬ	x^y	x^w	χ	h
Resonants	m	n		l	y	w		
Glott. Res.	m̂	n̂		l'	ŷ	ŵ		

The phonemicization given above would imply the existence of quite a few rules in order that we might relate the phonetic and phonemic inventories. Let us look at these rules.

1. <u>OBSTRUENT VOICING:</u>

With respect to the consonants, the most striking difference between the phonetic and phonemic inventories, is the lack of voiced obstruents in the latter. Of the class of obstruents, the non-ejective stops and affricates become voiced when they immediately precede a vowel. Consider the following phonetically[2] represented examples.

1(a)	wílp^h	'house'	(house)
(b)	wílb-a	'Does he have a house?' (house-Q)	
2(a)	q^w'óts[3]	'cut'	(cut)
(b)	q^w'ódʒ-ɩn	'you cut'	(cut-2s)
3(a)	G^{w}ɔ́:t^h	'heart'	(heart)
(b)	G^{w}ɔ́:d-ɩy̌	'my heart'	(heart-1s)
4(a)	χsk^{w}ʊnɛ́:χ-k^{wh}	'cold'	(cold-STATIVE)
(b)	χsk^{w}ʊnɛ́:χ-g^w-ʊm wəné:x^y	'cold food' (cold-STAT-ATTRIB food)	
5(a)	ʔænɔ́:G^w-ʊm̥	'we like'	(like-1p)
(b)	ʔænɔ́:q^{wh}-dit^h	'they like'	(like-3p)

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[2]The data given in the first part of the paper will be phonetically represented. Once the phonemic inventory with necessary rules has been established, the data will then be presented in phonemic form.

[3]Note that in the case of example 2(b), <u>ts</u> is not only voiced but also palatalized because it precedes a front vowel.

From the above examples we see that:

$$\begin{bmatrix} p \\ t \\ k \\ q \\ ts \end{bmatrix} \longrightarrow \begin{bmatrix} b \\ d \\ g \\ G \\ dz \end{bmatrix} \quad / \_\_ V$$

Very generally, we may represent the above noted phenomenon as:

6. Obstruent Voicing:[4]

$$[-\text{cont}] \longrightarrow [+\text{voice}] \ / \ \_\_ \ \begin{bmatrix} +\text{voc} \\ -\text{cons} \end{bmatrix}$$

2. ASPIRATION:

Aspirated stops occur word-finally and before other aspirated stops. This is illustrated in 7 below.

7(a) $nəg^{w}\acute{ɔ}\text{:}ht^{h}$ 'father' (father)

(b) $nəg^{w}\acute{ɔ}\text{:}ht^{h}\text{-}t^{h}$ 'his father' (father-3s)

We can therefore account for all aspirated stops by postulating that they occur at a word boundary.

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[4]For convenience the rules will be represented in the format of the Standard Theory (SPE and subsequent work) except where there is evidence that any particular feature(s) should be autosegmentalized – in which case the rules will then be presented according to the format of Autosegmental Theory.

The rule is:[5]

8. Aspiration:

$$\begin{bmatrix} \text{-cont} \\ \text{+del rel} \end{bmatrix} \longrightarrow [\text{+aspirated}] \; / \; \_\_ \; \#$$

3. <u>SPIRANTIZATION:</u>

In Section A it was mentioned that the voiced uvular fricative was relatable to its homorganic stop. The uvular stop has a tendency to spirantize in intervocalic position. We describe it as a tendency since spirantization of this consonant does not occur in all instances of the inter-vocalic position, nor does it occur consistently with all speakers. Some examples of spirantization are:

9(a) Gɔ́:da 'no more' (no more)

(b) lu-χ̣ɔ́:da 'empty' (in-no more)

(c) lu-χ̣at-Gɔ́:da 'empty(plural)' (in-REDUP-no more)

but there are also the following examples.

10(a) GaGétk^{w}-ɬ g^{y}ídəχ tg^{w}ún 'This question is difficult' (difficult-CONN question this)

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[5]Note that this thesis employs the notion of levels as proposed by Kiparsky (1982); however the symbol # is employed in rules as a mnemonic device to indicate processes occurring at the final cyclic level.

(b) $Ga\gamma\acute{e}tk^{w}$-ɬ $g^{y}\acute{i}d\partial\chi$ $tg^{w}\acute{u}n$ 'This question is difficult'
(difficult-CONN question this)

It appears then that there is an optional rule of the form:

11. Spirantization:

$$\begin{bmatrix}-\text{cont}\\+\text{back}\\-\text{high}\end{bmatrix} \longrightarrow [+\text{cont}] \;/\; \begin{bmatrix}+\text{voc}\\-\text{cons}\end{bmatrix}\_\_ \begin{bmatrix}+\text{voc}\\-\text{cons}\end{bmatrix}$$

By appealing to the rules of Obstruent Voicing (cf. 6) and Spirantization (11 above), we can classify [γ] and [γ^{w}][6] as allophones of /q/.

4. ROUNDING AND PALATALIZATION

The phenomena of rounding and palatalization will be treated jointly because of certain parallelisms which will become apparent as we work through this section. Note that rounding refers to uvulars whereas palatalization refers to the alveo-palatal affricate. Uvulars are rounded in the environment of round vowels and the alveo-palatal affricate becomes palatalized when before front vowels. In the examples below, compare the distribution of the plain affricate with that of the palatalized affricate, as well as the distribution of the plain uvular with that of the

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[6]For [γ^{w}] we need an additional rule of rounding which will be described later.

rounded uvular.

Alveo-palatal Africate:

12. q^{w}ó:ts	'cut'	(cut)
13. q^{w}ódʒ-iŷ	'I cut'	(cut-1s)
14. dz^{y}ǽk^{wh}	'kill'	(kill)

Uvulars:

15. G^{w}ɔ́:t^{h}-t^{h}	'his heart'	(heart-3s)
16. Gán	'tree'	(tree)
17. ləχáh	'sky'	(sky)
18. nɔ́χ^{w}-t^{h}	'his mother'	(mother-3s)

This predictability can be captured by rules of the form:

19. Rounding:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{back} \\ +\text{lo} \end{bmatrix} \longrightarrow [+\text{round}] \;/\; \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ +\text{round} \end{bmatrix}$$

20. Palatalization:

$$\begin{bmatrix} -\text{cont} \\ +\text{strid} \\ +\text{del rel} \end{bmatrix} \longrightarrow [+\text{hi}] \;/\; \_\_ \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ -\text{back} \end{bmatrix}$$

Note that aside from the uvular and alveopalatal consonants which are subject to rounding and palatalization respectively, there is a series of underlyingly palatalized and rounded velars. Consider these examples in which palatalization and rounding cannot be attributed to the environment.

Rounded Velar Series:

21.	ts'í:k^{wh}	'to leak'	(leak)
22.	t'ǽk^{wh}	'to twist'	(twist)
23.	t'g^{w}ǽntk^{wh}	'to fall'	(fall)
24.	t'ǽx^{w}	'to sweep'	(sweep)

Palatalized Velar Series:

25.	k'^{y}óts	'yesterday'	(yesterday)
26.	hóg^{y}ax̣	'to be right'	(right, correct)
27.	sæʔónsk^{yh}	'paper'	(paper)

If we propose that the underlying velar series is composed of the palatalized and the rounded consonants, then we must account for the occurrence of the plain velar consonants. Consider these examples.

28.	mílksəx̣	'sour'	(sour)
29.	ksi-t'ák^{wh}	'to wring'	(out of-twist)
30.	ʔǽks	'water'	(water)
31.	dákɬ	'to tie'	(tie)

The above examples would lead us to believe that the plain velar consonant is the variant found in consonant clusters. We would therefore want to attribute this variant to either the underlying palatalized or labialized series on the basis of complementary distribution. It turns out that the labialized series also can occur in clusters. For example:

32.	k^{w}ɬi-	'all over'	(all over)
33.	dúk^{w}ɬinx	'to drown'	(drown)

On the basis of the above examples, we can rule out classifying [k] with /k^w/, but let us consider the distribution of [k^y] in clusters. Note that word boundaries are marked in the following examples where relevant.

34. wǽk^{yh}#t^h 'his brother' (brother-3s)

35. dæɬí:sk^{yh}#t^h 'her stocking' (stocking-3s)

36. wǽk^y#g^w-iỷ 'my brothers' (brother-PL-1s)

37. dzux^w-dʒǽk^{wh}-ɬ sk^yæk^{yh}#ɬ ʔasʔús

(REDUP-kill-CONN eagle-CONN REDUP-dog)

'the eagle killed the dogs'

If we compare the above examples with those cited in 28 to 31, we can see that [k] clusters morpheme-internally whereas [k^y] can only cluster where there is an intervening word boundary.

In addition, consider the following examples:

38. t'ix-t'ák^{yh} 'to forget (plural)' (REDUP-forget)

39. dix-dík'^{y} 'to be shy (plural)' (REDUP-shy)

Note that C_2[7] of the reduplicative prefix is not palatalized whereas C_2 of the root is. Here too, we have another instance of the unpalatalized version of the velar consonant occurring in clusters. It seems, then, that we can classify [k] as a variant of /k^y/. We can write a morphophonemic rule

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[7]The spirantization of this consonant will be accounted for in Chapter 2.

to the effect of:

40. Velar Depalatalization:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{high} \\ -\text{back} \end{bmatrix} \longrightarrow [+\text{back}] \; / \; \underline{\quad} \begin{bmatrix} +\text{cons} \\ -\text{voc} \end{bmatrix}$$

This rule does not apply across a word boundary. In other words, the rule occurs at an earlier level than does the attachment of affixes of the type before which [k^y] occurs in examples 34 to 37.

Note that the preceding argument also holds for the velar fricatives and the ejective velar series. Therefore, the velar consonants consist of the underlying series of palatalized and labialized plain stops, ejective stops and fricatives.

5. RESONANT DEVOICING

Glottalized resonants are partially devoiced when they occur in word-final position. Compare the distribution of the fully voiced and the devoiced glottalized resonants in the examples below.

41. m̉ǽ:l	'canoe'	(canoe)
42. ˀǽnɔ́:G^{w}-ʊm̥̉	'we like'	(like-1p)
43. mǽ:ỷ-ɩỷ̥	'my berry'	(berry-1s)
44. mǽ:ỷ̥	'berry'	(berry)
45. Gɑnǽ:w̥̉	'frog'	(frog)
46. Gɑnǽ:w̉-ɩỷ̥	'my frog'	(frog-1s)

The rule would therefore be:

47. Resonant Devoicing:

$$\begin{bmatrix} +\text{sonorant} \\ +\text{glottal} \end{bmatrix} \longrightarrow [-\text{voice}] \;/\; \_\_ \;\#$$

6. <u>THE BEHAVIOR OF THE GLOTTAL FRICATIVE</u>

It was mentioned earlier that it is possible to show that [ħ] is relatable to /h/. Let us examine their distribution in these data.

48. hinádzaχ	'to spank'	(spank)
49. hít-ˀn	'to stand something'	
[hít'ɩn]	(stand-CAUS)	
50. hat-hí:t-ˀn	'to glue something'	
[hat-hí:t'ən]	(REDUP-stick-CAUS)	
51. t'ip-hók'^{w}ilt	'to roll something down'	
	(down-roll)	
52. hap-hápk^{wh}	'to catch an animal'	
	(REDUP-catch)	

From the above examples, it is clear that [h] occurs word-initially, and medially in clusters. Let us compare the distribution of [ħ]

53. ħóg^{y}aχ	'to be right'	(to be right)
54. ħiɬ-yǽtɬ'iksk^{wh}	'to slip'	(REDUP-slip)
55. k^{w}ɬi-ħis-yǽts	'to beat up	
	(all over-REDUP-hit)	
56. sta-ħiɬáq-ˀn	'to break on one side'	
[sta-ħiɬáq'an]	(one side-break-CAUS)	

57. ɦi-ɦ̄ítk^{wh} 'to stand down on' (straight down-stand)

We can see from these examples, that [ɦ̄] occurs word initially, and medially only in intervocalic position. Unlike [h], it never clusters.

It is clear that we may get either [ɦ̄] or [h] in word-initial position. In fact, consultants gave single lexical items with both [ɦ̄] and [h] occurring in word-initial position. It seems that we can claim free variation for these sounds when they appear at the beginning of a word. With respect to intervocalic position, we have a clear case of voicing. It turns out however that it is also possible to delete the consonant between vowels. Compare these examples;

58. ɦi-ítk^{wh} 'to stand something down ' (straight down-stand)

59. k^{w}ɬi-áks 'to thoroughly insult' (all over-insult)

60. k^{w}ɬi-ix-háks 'to thoroughly insult(plural)' (all over-REDUP-insult)

Whether /h/ voices or deletes in inter-vocalic position does not appear to be contingent on phonological factors. Note that ɦiítk^{w} and ɦiɦ̄ítk^{w} occur in the identical context. We can therefore conclude that /h/ is voiced between vowels, and in turn [ɦ̄] is subject to an optional rule of deletion between vowels.

Let us further examine the behavior of /h/ in the examples to follow. Note that in each of the examples below, an intermediate (rather than underlying) representation and a surface representation are given in order to show the position of the glottal fricative.

61.dəm-his-yǽdz^{y}-iŷ	(FUT-REDUP-chop-1s)
[dəm-is-yǽdz^{y}-iŷ][8]	'I will chop (plural)'
62. dəm-hasáγ-aŷ	(FUT-need-1s)
[dəm-asáγ-aŷ]	'I will need'
63. tq'al-hí:t-ʔn	(against-stick-CAUS)
[tq'al-í:t'-ən]	'to stick something against'
64. tq'al-hat-hí:t-ʔn	(against-REDUP-stick-CAUS)
[tq'al-at-hí:t'-ən]	'to stick something against(plural)'
65. wałin-hu-wílp^{h}	(old-REDUP-house)
[wałin-u-wílp^{h}	'old houses'

The above examples indicate that /h/ is consistently lost after /m/,/n/ and /l/. This observation can be captured by a rule of the form;

66. 'h' Deletion:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{cont} \\ +\text{lo} \end{bmatrix} \longrightarrow \emptyset \ / \ \begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{sonor} \\ +\text{ant} \end{bmatrix} \_\_$$

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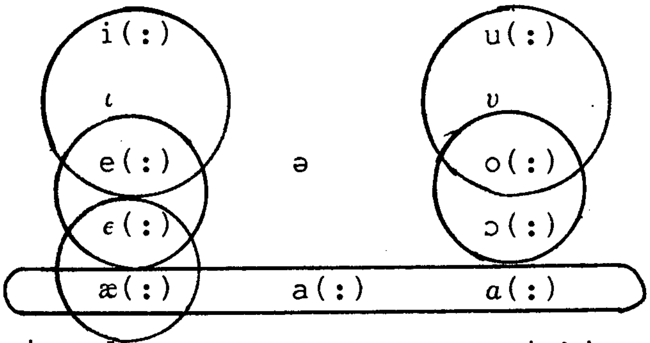
[8]Compare <u>dəm-yǽdz^{y}-iŷ</u> 'I will chop(sing.)'.

C. PHONEMIC INVENTORY OF VOWELS

It appears that the vowels enjoy a rather wide range of pronunciation, often resulting in a great deal of surface overlap. The figure below illustrates the areas over which the various vowels may range. The phonetic inventory is again cited below.



The vowel variation does appear to occur within certain limits. In the case of the high vowels, the constraints on variation are provided by the uvular consonants. For example, a single speaker gives the following pronunciations[9].

67. g^{y}ibú: / g^{y}ibó:	'wolf'	(wolf)
68. ʔús / ʔós	'dog'	(dog)
69. q^w'óts / q^w'ʊ́ts	'cut'	(cut)
(not *q^w'úts)		

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[9]Note that the variation given in the examples was found to occur with all speakers, and a single word would be pronounced differently in the identical utterance. The examples cited are a few of a great many words exhibiting the variation in vowel pronunciation.

70. GaGétk^{wh} / GaGɩ́tk^{wh} 'expensive' (expensive)

(not *GaGítk^{wh})

71. yén / yɛ́n 'walk' (walk)

72. χsk^{w}ʊnɛ́xk^{wh} / χsk^{w}ʊnǽxk^{wh} 'cold' (cold)

73. dzɔ́q^{wh} / dzóq^{wh} 'camp' (camp)

74. mædzɑGəlé: / mɑdzɑGəlé: / mɑdzɑGəlé:

'flower' (flower)

A system which allows so much variation in vowel pronunciation presents no small problem for phonemicization. Let us propose the following five vowel system.

i(:) u(:)

e(:) o(:)

a(:)

There is evidence to show that the above phonemes contrast in identical environments. However within this five vowel system, there is a great deal of overlap between phonemes (consider the examples in 67 to 74). It seems that we can propose the following allophonic distribution (which is more of a tendency than a rule, since there is so much variation), as well as certain constraints to handle the residue. Note that the observations below also apply to the long counterparts of the vowels.

75. /i/ —> [ɩ] / Uvular__

/u/ —> [ʊ] / Uvular__

/a/ —> [æ] / Velar__

/a/ —> [ɑ] / Uvular__

In addition:

76. /i/ ≃ /e/ (but *i / Uvular__)

77. /u/ ≃ /o/ (but *u / Uvular__)

We must also note that [ɑ] occurs most frequently with uvulars and [æ] with the palatalized velar series although both sounds do occur elsewhere.

With respect to the mid vowels /e/ and /o/, I have not been able to find any conditioning factors that would predict when we get [e] or[ɛ], or [o] or [ɔ]. This lack of predictability would seem to force an analysis in which we treat the four sounds as independent phonemes and account for the variations as in examples 67 to 74 by overlap between the various phonemes. My argument against this analysis is based on symmetry in the rest of the system, namely between the high vowels. It seems, then, that we must treat [e] and [ɛ] as free variants of /e/, and [o] and [ɔ] as free variants of /o/. Altogether this analysis proposes the following:

78. /i/ —> [ɩ] / Uvular__
—> [i]
/u/ —> [ʋ] / Uvular__
—> [u]
/e/ —> [ɛ]
—> [e] where [e] and [ɛ] are free variants
/o/ —> [ɔ]
—> [ɔ] where [o] and [ɔ] are free variants

/a/[10] —> [ɑ] / Uvular__

—> [æ] / Palatalized velars__

—> [a]

In addition to 78, we need to account for the overlap by statements such as those previously given in 76 and 77.

With respect to schwa, it seems that any short vowel may reduce to schwa when adjacent to a stressed vowel. This occurs most often when there is a long vowel in an adjacent syllable. See example 74 and also compare 79 and 80.

79. g^{w}ɩlǽh 'blanket' (blanket)

80. g^{w}í:ləh 'blankets' (blanket(plural))

An alternative solution seems possible. Let us consider a three vowel system.

i(:)		u(:)
	a(:)	

We would need to claim that /i(:)/ varies freely all the way down to [ɛ(:)] and /u(:)/ all the way down to [ɔ(:)]. The analysis for /a(:)/ and the constraints provided by the uvular consonants would be the same as in the five vowel system. This three vowel system seems highly undesirable because of its heavy reliance on free variation, and this suggests that there is very little systematicity to the pronunciation of the vowels. In another sense, this analysis may have some merit in that if there are only three underlying distinctions, then the range of pronunciation of

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[10]This statement represents a tendency rather than a rule.

the vowels does have some plausibility.

We are therefore left with two analyses – neither of which seems readily acceptable. However, pending further enlightenment, I opt for the the five-vowel system since it seems somewhat more constrained than the second analysis.

Having established the phonemic inventory of the language, we will henceforth represent all data phonemically.[11] Let us now turn our attention to the assignment of stress, a phonological process relevant to reduplication.

D. STRESS ASSIGNMENT

Typically, primary stress is assigned to the last vowel of the root. It should here be mentioned that by far the majority of Nisgha roots are monosyllabic. On the other hand, long vowels do attract stress; therefore if a long vowel is present in a polysyllabic root, that long vowel receives primary stress. Consider the following examples:

81. hanáq'	'woman'	(woman)
82. ˀam-ˀó:-k^{y}it	'clothes'	
	(good for-cover-person)	
83. lú:laq	'ghost'	(ghost)
84. ta:łé:t	'sleet'	(sleet)
85. q'ap'alú:	'gun'	(gun)

The stress rule is then:

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[11]See Appendix I.

86. Stress the rightmost long vowel of the root; otherwise stress the final vowel of the root.

The stress rule as stated above is true of the vast majority of cases but not of all, since stress may fall on the reduplicated prefix in words exhibiting one particular pattern of reduplication. When this reduplication type is dicussed, we shall invoke the notion of Levels as proposed by Kiparsky (1982), and this use of Levels will then obviate the need to define the root as the domain of the stress rule, as the domain may then be specified as Level I.

At the moment, let us consider a metrical representation of the Nisgha stress rule. In general, stress rules are sensitive to certain aspects of syllable structure e.g. closed vs. open syllables or (metrically represented) branching vs. non-branching rimes. In the case of Nisgha, stress assignment is sensitive to the branching/ non-branching nature of the nucleus. In other words, the stess rule looks at long vs. short vowels. The stress rule in a metrical framework is:

87. Stress Rule:

(i) Project the nucleus

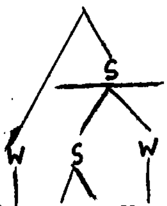
(ii) Start from the right margin

(iii) Construct a left dominant unbounded foot (F) in which the dominant node must branch

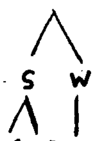
(iv) Gather all syllables into a right-dominant word tree.

Note that the domain of the stress rule is all Level I input (justification for this claim is given in Chapter 2, Section D). The rule applies to examples 81 to 85 as follows (Note that the unmarked labelling convention is assumed, i.e. the dominant nodes are labelled S and the recessive nodes W):

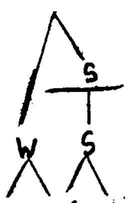
88. hanáq' 'woman'



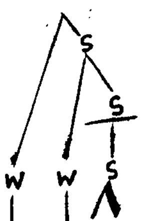
89. ʔamʔó:k^{y}it 'clothes'



90. lú:laq 'ghost'



91. ta:ɬé:t 'sleet'



92. q'ap'alú: 'gun'

Primary stress is assigned to those nodes dominated solely by S – hence the stress assignment in 88 to 92.

We will return to a discussion of stress in Section 2 when we discuss the particular reduplication pattern which bears primary stress on the prefix.

E. <u>BEHAVIOR OF UVULAR CONSONANTS</u>

In this section, we will consider the behavior of uvular consonants outside the context of reduplication. Their behaviour within the context of reduplication will be addressed in Chapter 2 where reduplication types are dealt with.

In Section B we noted the tendency of uvular consonants to weaken in certain positions, i.e. they spirantize when they occur in intervocalic position. In addition, these consonants are lost in other environments. Consider the following forms in which uvular deletion is optional. Note that there is compensatory lengthening on the preceding vowel when the uvular is deleted. The examples are:

93(a)	páχ	'to run' (run)
(b)	yúk^{W}-ɬ páχ-ŷ	'I am running' (ASP-CON run-1s)
(c)	yúk^{W}-ɬ pá:-ŷ	'I am running' (ASP-CON run-1s)
94(a)	páχ-n	'run!' (run-2s)
(b)	pá:-n	'run!' (run-2s)
95(a)	nóχ	'mother' (mother)
(b)	nóχ-ŷ	'my mother' (mother-1s)
(c)	nó:-ŷ	'my mother' (mother-1s)

96. ˀan-lu:-tó:s 'place for-in-put' (drawer)

Uvular loss in the root of the last example is affirmed by the presence of the uvular in the reduplicated prefix of the plural form ˀanlu: taχtó:s. It appears that a uvular consonant in the coda may optionally delete when followed by a consonant. We can write a rule to the effect of 97.

97. Uvular Deletion:

$$\begin{bmatrix}+\text{cons}\\ -\text{high}\\ -\text{low}\end{bmatrix} \longrightarrow \emptyset / \begin{array}{cc} R & O \\ \backslash & | \\ \_\_ & X \end{array}$$

On the other hand, there are several counter-examples to this rule:

98(a) náχ 'snowshoe' (snowshoe)

(b) náχ-ŷ [náχ-aŷ] 'my snowshoe' (snowshoe-1s)

but *ná:ŷ

99(a) t'áχ 'vest' (vest)

(b) t'áχ-ŷ [táχ-aŷ] 'my vest' (vest-1s)

but *t'á:ŷ

100(a) Gáχ 'rabbit' (rabbit)

(b) Gáχ-ŷ[Gáχ-ŷ] 'my rabbit' (rabbit-1s)

but *Gá:ŷ

One would like to account by phonological means for the difference between the forms that conform to the rule of uvular deletion and those which do not. If we compare the phonologically similar <u>naχ</u> (snowshoe) with <u>noχ</u> (mother), we see that the rule may apply optionally to the latter but not to the former. The difference in vowel between these forms does not seem to be a contributing factor, since the rule may apply to <u>paχ</u> (run) whose vowel is identical to that of <u>naχ</u> (snowshoe), a form to which the rule cannot apply.

It is interesting to note that the forms in which uvular deletion has applied are given by older speakers who also give, as alternatives, the (a) forms cited in 93 to 96. Younger speakers consistently give the (a) forms. However, not even within the speech of older speakers (in this data set, speakers age 54 to 61), do we find uvular deletion occurring in examples 98 to 100. This is in contrast to the claim of Tarpent (1983:168) that the rule of uvular deletion is a very general one in the speech of older speakers (those born prior to 1940, according to Tarpent). On the basis of examples 93 to 96, we can conclude that the rule is part of the grammar of an earlier stage of the language, but it is no longer productive in the grammar of younger speakers. Evidence of the application of this earlier rule within roots[12] has been left on a few lexical items (of the data collected, only those items listed in 93 to 96). Curiously enough, although Tarpent considers the process of uvular deletion to be a general one for older speakers, she cites

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[12]I specify "within roots" because evidence of the rule application outside of roots (i.e. in derived environments) can be found in the reduplicative pattern of a somewhat wider variety of forms.

only three roots exhibiting uvular deletion and they are the ones given in 93 to 96.

To summarize, we are claiming: (i) At an earlier stage of the grammar, the rule of uvular deletion was a general one. (ii) For older speakers, it is an optional rule which applies in a limited number of roots. (iii) For younger speakers, the rule is no longer productive. (iv) Evidence of the prior existence of the rule in non-derived forms can be found only in a few lexical terms. (v) Reduplication will provide evidence of its existence in certain derived environments in a slightly greater number of forms, possibly supporting the claim that the rule was formerly more general.

F. CONCLUDING REMARKS TO CHAPTER 1.

This chapter presented a sketch of Nisgha phonology. Its intention was to give an overall phonological picture of Nisgha and to highlight some of the more pervasive processes which play a part in Nisgha reduplication, the topic which will next be addressed.

II. PATTERNS OF REDUPLICATION

Within the corpus of data under study, reduplication serves two functions:

(i) To mark plurality – For example:

101.	qán	'tree'	(tree)
102.	qan-qán	'trees'	(REDUP-tree)

(ii) To mark aspect, indicating a progressive action – For example:

103.	qa-qó:l[13]	'running'	(PROG-run)

Reduplication as an aspect marker follows only one pattern; however as a marker of plurality, reduplication appears to adopt diverse patterns. This discussion will be concerned only with reduplication as it serves to mark plurality, since the reduplication pattern marking aspect is the same as one of the patterns marking plurality.

Before discussing the patterns of reduplication, let us first establish what triggers reduplication. Plural marking occurs most commonly on predicates, less often on nouns. We therefore find reduplication (one of a number of methods of pluralization) mostly in predicates. The marking of number on predicates is determined by the number of the object of the transitive predicate and by the subject of the

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[13]Note that the root of this particular form is itself a suppletive plural, the singular of which is /paχ/. The reduplicated prefix is therefore clearly not a pluralizer but rather an aspect marker.

intransitive predicate. In other words, a plural object of a transitive predicate and a plural subject of an intransitive predicate are the triggers of plurality marking.

There is a definite preference for marking plurality on predicates as opposed to nouns. Reduplication is often not found (though it may occur) on nouns if the plurality of the noun can be determined from the context. For example:

104. t'ix-t'ák^{y}-s [t'ixt'ág^{y}is] méri-ɬ taɬí:sk-t
REDUP-forget-CONN Mary-CONN stockings-3s
'Mary forgot her stockings'

105. his-yáts-s [hisyádʒis] rábin-ɬ qán
REDUP-chop-CONN Robin-CONN log
'Robin chopped the logs'

In the above examples, reduplication on the predicates indicates that the nouns are plural. Consider also this example:

106. kíl'pil-ɬ wílp-tit
two-CONN house-3p
'They have two houses'

In this last example, plurality of the noun can be determined by the numerical word preceding it.

Having established the factors that trigger reduplication, we can proceed to analyze the various patterns of reduplication employed by Nisgha as a method of pluralization.

A. SURFACE PATTERNS OF REDUPLICATION

Reduplication is done by affixing some part[14] of a root directly to that root. Therefore, if a form is made up of an affix followed by the root, then the reduplicated prefix will be added between the affix and the root. For example:

107.	ʔan-lu:-tó:s	'drawer' (place for-in-put)
108.	ʔan-lu:-taχ-tó:s	'drawers' (place for-in-REDUP-put)

The variability of the vowel, of C_1, and particularly of C_2 in the reduplicative prefix, cause the surface reduplication patterns to appear so diverse that they present a challenge for any attempt at taxonomic presentation. Given below, is what seems to be the minimal number of classifications based on surface manifestations of reduplication types. Within the following surface classifications, the prefix and root vowels are not indexed because, unlike the consonants, the nature of the vowel in the prefix is totally independent of the root vowel. The classifications are:

(i) $C_1V + C_1VC_2$

(ii) $C_iV + C_jVC_2$[15]

(iii) $C_1VC_2 + C_1VC_2$

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[14]The part to be prefixed will be specified later.

[15]The subscripts 'i' and 'j' are used to emphasize that the consonants differ.

(iv) $C_1VC_i + C_1VC_j$

(v) $C_iVC_2 + C_jVC_2$

(vi) $C_1\check{V}: + C_1VC_2$

The classifications given above should be regarded merely as a heuristic device. It will later be shown that all the surface patterns of reduplication can be subsumed under three basic patterns of Ci, CiC and Cix reduplication. I am therefore claiming that there is a reduplicative morpheme with the allomorphs, Ci, CiC and Cix. Within the three categories, all apparent anomalies will be accounted for by general phonological processes.

B. UNDERLYING PATTERNS OF REDUPLICATION

Reduplication takes place by copying C_1 and C_2 of the root.[16] The examples to follow will show that the prefix vowel is not copied from the root vowel. Evidence of this can be found in the following examples which show that neither the length nor the quality of the root vowel is copied into the reduplicative prefix.

109.	sí:pk^w	sipsí:pk^w	'to be hurting'
110.	t'é:st	t'ist'é:st	'to push something'
111.	ts'í:k^w	ts'ux^{w}ts'í:k^w	'to leak'
112.	q'óts	q'asq'óts	'to cut'

----

[16]Both C_1 and C_2 may undergo subsequent modifications which will be accounted for in the sections to follow.

Further evidence against an analysis of vowel copy can be found in examples whose roots are of the form C_1C_2VC.[17]

113. sqík^{y}sk^w saχsqík^{y}sk^w 'to get hurt'

114. lusq'é:χk^w lusaχsq'é:χk^w 'dark'

In the above examples s is C_1 and q or q' is C_2 which undergoes subsequent change in the reduplicative prefix. Note that the second of the above two examples is ambiguous, in that C_2 of the prefix is equal to C_3 of the root. This could mean that C_3 and not C_2 of the root is copied into the prefix. However, on the basis of saχsqík^{y}sk^w, we will assume that it is C_2 and not C_3 of the root that is copied. These examples analysed in an Autosegmental framework provide strong evidence against a rule of vowel copy because copying the root vowel entails the crossing of association lines,[18] and this constitutes a violation of the tenets of Autosegmental theory. The representation of vowel copy would be:

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[17]Tarpent (1983:136) cites these cases as evidence that the prefix vowel is not a "reduced version or a copy of the root vowel". However she claims that the original vowel is deleted from the prefix and a new vowel inserted. It is unclear to me how these examples support such an analysis. In fact they seem to argue against it.

[18]The principles of Autosegmental Theory will be outlined in a later chapter.

115. $*sq\acute{i}k^ysk^w$ + $sq\acute{i}k^ysk^w$

C VC + CCVCCC

Instead, it can be shown that the vowel quality is predictable on the basis of the adjacent consonants in the prefix. Note that /i/ seems to be the most commonly occurring vowel in the prefix. If we regard /i/ as part of the reduplicative morpheme, then it is possible to write a very natural rule acounting for its surface variation in the reduplicative prefix.

116. Vowel Variation:

$$\begin{bmatrix} +voc \\ -cons \\ +high \\ -back \end{bmatrix} \longrightarrow \begin{bmatrix} +low \\ +back \end{bmatrix} \;/\; \begin{bmatrix} +voc \\ -cons \\ -high \\ -ant \end{bmatrix}$$

$$\begin{bmatrix} +voc \\ -cons \\ +high \\ -back \end{bmatrix} \longrightarrow \begin{bmatrix} +round \\ +back \end{bmatrix} \;/\; \_\_[+round]$$

Independent motivation for the above rule is provided by lV prefixation, a method of pluralization whereby /l/ followed by a vowel is prefixed to a stem. Here too we can regard /i/ as the unmarked vowel of the prefix. Consider these examples:

117. la-$\chi sk^w in\acute{\varepsilon}{:}k^y s$ ȟidit

PL- cold 3P

'They are cold'

118. lu-x^{w}tí:tix^{y} ñum̃

PL- hungry 1P

'We are hungry'

119. li-t'é:q ñum̃

PL- eat quickly 1P

'We ate quickly'

The Vowel Variation rule can account for the vowels in the above examples of lV prefixation. The rule will also handle the vowels appearing in all the surface types of reduplication to follow.[19]

C. <u>UNDERLYING PATTERN Ci</u>

Under this pattern come surface types (i) and (ii).

Type (i) $C_1V + C_1VC_2$

120.	k^{y}át	k^{y}ik^{y}át	'man'
121.	qó:t	qaqó:t	'heart'
122.	pó:t	pipó:t	'boat'
123.	ts'ak^{y}	ts'its'ák^{y}	'bowl'
124.	ʔalá:n	ʔalilá:n	'slow'[20]
125.	ʔali:sk^{w}	ʔalilí:sk^{w}	'weak'

----

[19] In all the singular/plural examples to follow, a morpheme-by-morpheme breakdown will be omitted so as to facilitate presentation.

[20] These reduplicated forms (124, 125) differ from those cited by Tarpent whose data do not show a vowel between resonants in this pattern of reduplication.

Type (i) examples can be straightforwardly accounted for by the vowel variation rule. There are no consonantal changes in this type.

Type (ii) $C_iV + C_jVC_2$

126.	wá	huwá /wuwa/	'name'
127.	wá:χ	huwáχ /wuwa:χ/	'oar'
128.	wílp	huwílp /wuwilp/	'house'

Note that in each of these examples C_1 of the prefix is [h] when C_1 of the root is /w/. If we regard these examples as instances of Ci reduplication the derivation (citing only the rules relevant to this discussion) is as follows:

	/wa/
Ci Redup.	wi+wa
Vowel Variation	u

At this stage of the derivation, we have *wuwa. Among the data collected, there are no instances of the sequence wu. It seems that the form *wuwa would be in violation of the phonotactics of the language which do not appear to permit homorganic vowels and glides[21] in word-initial position. This being the case, the glide becomes h which may be realized as either [h] or [h̄] (see the discussion of the glottal fricative in Chapter 1). The complete derivation for

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[21] It will later be shown that the same holds for the high, front glide and vowel. I have found one exception, namely /yim/ 'to sniff' (cf. 183)

Type (ii) forms would be:

	/wa/
Ci Redup.	wi+wa
Vowel Variation	u
Stress	´
Glide to h	h
	[huwá] or [ħuwá]

Reduplication Types (i) and (ii) have therefore been accounted for according to an underlying Ci pattern of reduplication.

D. UNDERLYING PATTERN CiC

Under this pattern come surface Types (iii) to (v).

Type (iii) $C_1VC_2 + C_1VC_2$

129. t'ís	t'ist'ís	'large'
130. múx^w	$\text{mux}^w\text{múx}^w$	'ear'
131. ʔús	ʔasʔús	'dog'
132. qalts'áp	qalts'ipts'áp	'village'

In this reduplication type, C_1 and C_2 of the prefix are identical to C_1 and C_2 of the root. Here too, the vowel variation rule predicts the nature of the vowel in the prefix.

Type (iv) $C_1VC_i + C_1VC_j$

This type includes examples which must be handled by two different underlying patterns of reduplication, namely CiC and Cix. In this section, we will deal only with those examples which reduplicate according to underlying pattern

CiC. In all Type (iv) examples, C_2 of the root and prefix differ. Consider first these cases involving uvular consonants as C_2.

133. sú:qsk^w saχsú:qsk^w 'dive'

134. wóq 'sleep' waχwóq 'bat'

135. lusq'é:χk^w lusaχsq'é:χk^w 'dark'

136. ɬó:q ɬaχɬó:q 'wake up early'

In these examples, when C_2 of the root is a uvular stop, it is reduplicated as a fricative. Uvular stops also exhibit a sporadic tendency to spirantize outside the context of reduplication.[22] This may occur when the uvular stop is in word-final position or when immediately followed by a consonant; both these environments generalize to the coda position. Consider the following phonetically represented examples.

137(a) ʔanɔ́:q^w-dit 'they like' (like-3p)

(b) ʔanɔ́:x^w-dit 'they like' (like-3p)

138(a) t'ɔ́:q^w 'scratch' (scratch)

(b) t'ɔ́:t'áχ 'scratch' (REDUP-scratch)

We can therefore write a rule that would reflect the behavior of C_2 in examples 133 to 136, as well as the sporadic spirantization of uvulars elsewhere.

139. Uvular Spirantization II:[23]

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[22] Dunn (1983) also notes this phenomenon for uvular syllables in Tsimshian.

[23] Recall that uvulars also spirantize in intervocalic

$$\begin{bmatrix} -\text{cont} \\ +\text{back} \\ -\text{high} \end{bmatrix} \longrightarrow [+\text{cont}] \;/\; \underset{\_\_}{\overset{R}{\diagdown}} \overset{O}{\underset{X}{|}}$$

The second set of examples with differing C_2 involves cases where C_2 of the root is an affricate.

140. k^y'átsk^w k^y'isk^y'átsk^w 'to arrive'

141. q'óts   q'asq'óts   'to cut'

142. yátł'   ħiłyátł'   'to slip'

Note that only the second element of the affricate is copied as C_2 of the prefix. This is striking, especially since these affricates function in Nisgha as units[24] rather than as sequences of sounds. In Chapter 4, an alternative approach analyzing these types will be proposed.

The third set of Type (iv) examples pertain to those forms in which C_2 is a velar consonant.

143. ts'í:k^w ts'ux^{w}ts'í:k^w 'to leak'

144. t'ák^w t'ux^{w}t'ák^w 'to twist'

145. ts'ák^w ts'ux^{w}ts'ák^w 'to kill'

The velars behave in C_2 position as do the uvulars; we will

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[23](cont'd)position (cf. 11).

[24] Evidence for this is provided by an example such as q'ots 'to cut'. The first person singular is [q'^{w}odz^{y}iŷ]. If dz^y (palatalization is due to the vowel following cf.20) were a sequence rather than an affricate, we would expect to find z occurring in isolation; it does not. We can therefore conclude that ts is an affricate.

later see that the uvulars and velars also behave alike in the Type (vi) pattern of reduplication.

The next set to be discussed includes reduplicated forms in which C_2 is a glottalized resonant.

146. łim̓ó:l' łim̓ilm̓ó:l' 'to wrap'

147. łipál' łipilpál' 'to massage'

148. q'ín̓ q'anq'ín̓ 'to chew'

149. ts'ál' ts'ilts'ál' 'face'

In these examples, the glottalized resonants of the root are reduplicated in the prefix as non-glottalized consonants.

Type (v) $C_iVC_2 + C_jVC_2$

According to this pattern, C_1 of the reduplicated prefix is different from C_1 of the root.

150. yánk^w hinyánk^w /yinyank^w/ 'mouldy'

151. yáłk^w hiłyáłk^w /yiłyałk^w/ 'slippery'

152. yátł'ik^{w}s hiłyátł'ik^{w}s /yiłyatł'ik^{w}s/ 'to slip'

153. yáts hisyáts /yisyats/ 'to chop'

Like Type (ii) examples, C_1 of the prefix is [h] while C_1 of the root is a glide, homorganic with the following vowel. The same explanation as for Type (ii) holds for these examples.[25] One can write a single rule to handle both front

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[25] Note that the phonetic sequence yi may occur word-medially, but in these cases, the glide is epenthetically inserted between vowels e.g. w̓á-y-i-ł (find-EPEN-ERG-CONN).

and back glides.

154. Glide to 'h':

$$\begin{bmatrix} -\text{cons} \\ -\text{voc} \\ +\text{hi} \\ \beta\text{back} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{cons} \\ +\text{lo} \\ -\text{back} \\ -\text{rd} \end{bmatrix} \; / \; \_\_ \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ +\text{hi} \\ \beta\text{back} \end{bmatrix}$$

Example 153 can be derived as below:

	/yats/
CiC Redup	yis+yats[26]
Vowel Variation	i (applies vacuously)
Glide to h	h
	[hisyats]

Type (vi) $C_1\acute{V}{:}+C_1VC_2$

The examples exhibiting this type of reduplication appear to copy C_1 of the root and follow it by a long stressed vowel. The most striking difference about this type is the long vowel and the presence of stress in the reduplicative prefix rather than in the root. The examples below show that C_2 of roots participating in Type (vi) reduplication is a uvular.

155. hiłáq'an	hiłá:łaq'an	'to break'
156. m̓áqs	m̓á:m̓aqs	'pants'
157. nóχ	nó:naχ	'mother'
158. t'óq	t'ó:t'aχ	'to scratch'
159. wóq	wó:waq	'to sleep'

In Chapter 1 Section E, the loss of a uvular in coda position along with compensatory lengthening was discussed.

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[26] C_2 of the prefix has been accounted for under Type (iv).

If we assume that C_2 of the root is copied, then the same rule (cited earlier as 97),[27] can be invoked here to account for the uvular deletion and the long vowel in the prefix. In the Type (iv) classification, there were instances of uvular spirantization in the same environment. Types (iv) and (vi) would need to be differentiated in some way. If we assume that spirantization occurs before uvular loss, then Type (vi) forms can be marked for participating in the uvular deletion rule whereas Type (iv) forms would not. In Chapter 1, Section E, it was argued that uvular deletion was no longer a productive rule of the grammar. This along with the fact that there are so few forms exhibiting Type (vi) reduplication, would imply that this pattern is no longer productive. The difference between Type (vi) and Type (iv) examples, those whose C_2 is a spirant, can be reconciled by positing the occurrence of spirantization prior to uvular deletion and the current loss of the rule of uvular deletion as a general rule.

In addition, note the following examples whose C_2 is a velar and which also reduplicate according to the Type (vi) pattern.

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[27] The rule will be reformulated to take into account compensatory lengthening when an Autosegmental treatment of the reduplication process is given. Since compensatory lengthening is problematic for the notation of the Standard Theory, I will not attempt to formulate the rule here.

160. náks ní:niksk^{w} 'to get married'

161. pláksk^{w} plí:łiksk^{w} 'to be tired'

An argument parallel to that of the uvulars can be made for these examples. In the case of example 161, I have no idea why the lateral fricative appears in the reduplicated form (cf. Tarpent (1983:206), note 50).

The change of root vowel in some of the reduplicated forms is another outstanding property of Type (vi) examples. The fact that, in the case of the uvulars, the prefix vowel is always the same as the original root vowel, suggests that the former may be a copy of the latter. This may have been a characteristic of this earlier pattern of reduplication. In the case of the velars, the prefix vowel is exactly what we would expect, but I am uncertain how the change of root vowel is to be accounted for.

The final differentiating characteristic of Type (vi) is the stressed prefix vowel. Chapter I stated that long vowels in a root usually attract stress. The inaccuracy of the claim that stress always falls within a root was also mentioned. Let us compare Type (vi) examples with other examples containing unstressed long vowels outside of the root.

162. ʔan-lu:-tó:s 'drawer' (place for-in-put)

163. lu:-six-sityé:x^{w} 'trade,change' (in-REDUP-change)

164. lu:-qáts 'pour' (in-pour)

In examples 162 to 164, the long vowels occurring outside the roots never attract stress away from the root, regardless of the length of the root vowel. Consider also the following:

165. ta:łé:t 'sleet' (sleet)

Example 163 shows that when a root contains more than one long vowel, stress falls on the rightmost of these vowels.

The difference in stress assignment in the above cases and those in Type (vi) can be explained by the use of levels as proposed by Kiparsky (1982). In all reduplicated examples, the reduplicative prefix is attached directly to the root; therefore it can be argued that reduplication takes place at an earlier stage than does the attachment of the proclitics. The uvular deletion rule also occurs earlier than the attachment of proclitics. Consider the following examples in which uvular deletion does not apply.

166. laχ-qal-ts'áp	'Greenville (town)'	
	(on-around-where people live)	
167. laχ-t'áχ	'lake'	(on-lake)
168. laχ-sí:ltah	'ocean'	(on-?)

Note that in all these examples, the uvular is in preconsonantal position and in a derived enviroment as it is in the case of Type (vi) reduplication. If we assume that at Level I, reduplication, uvular deletion and stress assignment occur, but the addition of proclitics takes place at a later level, then we can explain (i) the fact that the reduplicative prefix is attached directly to the root, (ii) the occurrence of stress on the long vowel of the prefix and the non-occurrence of stress on the long vowel of proclitics, (iii) the fact that the uvular deletion occurs in derived environments created by reduplication but not in derived environments created by the addition of proclitics. In addition, there is no longer a need to state the domain of the stress rule , since all Level I input will automatically be subject to the stress assignment rule. In other words, Level I defines the domain of the rule. The stress in the prefix of Type (vi) examples is therefore not an intrinsic property of this reduplication type but rather follows naturally from the stress assignment rule and its place in the grammar.

E. UNDERLYING PATTERN Cix

Some of the examples appearing under surface Type (iv) must be treated as belonging to the underlying pattern Cix. In this type, C_1 of the root is copied and it is followed by ix which constitutes part of the Cix[28] allomorph of the reduplicative morpheme.[29] Consider these examples.

169. k^yímx^{y}t k^yixk^{y}ímx^{y}t   'brother (of female)'

170. qanm̓álaˀ   qaxqanm̓álaˀ   'button'[30]

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[28] The allomorph is really Cix^y but x^y is depalatalized according to the rule outlined in Chapter 1:Sect. B, Part 4. The examples are represented without the palatalization.

[29] Recall that it was claimed that the reduplicative morpheme has the allomorphs Ci, CiC and Cix.

171. q'alté:χk^{w} q'axq'əlté:χk^{w}
'to shiver'

172. sí:pk^{w} sixsí:pk^{w} 'to be hurting'

173. hók^{y}aχ haxhók^{y}aχ 'to be right'

174. t'iphók'^{w}ilt t'iphax^{w}hók'^{w}ilt
'to roll something down'

The vowel variation rule also accounts for the vowel in the prefix of this type. Note that example 174 t'iphax^{w}hók'^{w}ilt is evidence that /i/ —> a (see Vowel Variation rule given in 116.) when adjacent to Glottals or Uvulars is ordered before /i/ —> u before a rounded consonant; otherwise the prefix vowel of this example would be u. Now compare these cases.

175. yóˀok^{y}s hixyóˀok^{y}s 'to wash'

176. yátł'ik^{w}s hixyátł'ik^{w}s 'to slip'[31]

In these examples we accounted for /h/ in C_1 position by a rule given in 154. These examples provide evidence that this rule applies after the Vowel Variation rule; otherwise the prefix vowel would be a, as it is in the previous examples where C_1 of the root is /h/.

In addition, the following examples should be noted.

177. hinátsaχ hixhinátsaχ 'to spank'

178. hák^{y}s hixhák^{y}s 'to insult'

179. ˀamqó:k^{y}it hixˀamqó:k^{y}it 'beautiful'[32]

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[30] (cont'd)[30] Tarpent (1983) cites qanmilm̓álaˀ.

[31] Also reduplicates as hiłyátł'ik^{w}s.

[32] Also reduplicates as ˀaxˀamqó:k^{y}it.

In these latter examples, we would expect the prefix vowel to be a, given that C_1 is a glottal consonant. Clearly these cases cannot be accounted for as we did the previous set of examples. Tarpent(1983:158) claims that hix can be considered an independent plural marker. The very last example, hixʔamqó:k^{y}it appears to substantiate this claim, since a glottal stop in C_1 position of a root always reduplicates as a glottal stop. This can be seen in examples cited elsewhere and also in the alternative reduplicated form, i.e. ʔaxʔamqó:k^{y}it.

Tarpent (1983) notes that a great many of the roots participating in Cix reduplication are bi-syllabic. There does not however, seem to be any clear way whereby one can classify this type as belonging to the CiC pattern, and account for x in C_2 position of the prefix by phonological means. The Cix pattern appears to bear some affinity to the CiC pattern in which C_2 of the root is a velar and C_2 of the prefix, the velar fricative x. C_2 of the Cix examples does not seem to have any common features which would make it readily classifiable with the velar consonant.

In addition, the following examples provide strong support for treating CiC and Cix as distinct patterns of reduplication.

180. qaqétk^w	qaxqaqétk^w	'expensive, difficult'
181. sq'añís	sixsq'añís	'mountain'
182. sq'alísaʔ	sixsq'alísaʔ	'curtain'

In these examples C_2 is a uvular consonant. It was shown earlier, under Types (iv) and (vi) patterns, that uvulars in C_2 position of the root reduplicate in the prefix as spirants or are lost altogether. Clearly the above examples (in which C_2 of the root is a uvular) fall in neither of these categories. We are therefore forced to posit a Cix allomorph of the reduplicative morpheme.

F. PATTERNS OF REDUPLICATION AND PRODUCTIVITY

The corpus of data under study indicates that the CiC and Cix patterns of reduplication are far more common than the Ci pattern. It is not likely that this can be attributed to skewness of these data since the data presented in Tarpent (1983) also substantiate this claim. Among these patterns of reduplication, I have been able to detect no semantic difference, with perhaps one possible exception which I put forward very tentatively.

In Section E of this chapter we discussed the _hix_ reduplicative prefix and we noted that unlike the other reduplicative prefixes, its vowel was not subject to the Vowel Variation rule. We also noted that C_1 of the prefix was not necessarily a copy of C_1 of the root. Both these characteristics set the _hix_ prefix apart from the other reduplicative prefixes. As mentioned earlier, Tarpent suggests that _hix_ might be considered an independent pluralizer. The tentative suggestion that I wish to put forward is that the _hix_ prefix may hold some semantic difference. If this were the case, then we might have made a step in the direction of accounting for its apparently anomalous behavior. Let us consider some other forms in which the hix prefix appears.

183(a). yim-yím-ɬ ʔas-ʔús-ɬ ts'i-ts'í:p
REDUP-sniff-CONN REDUP-dog-CONN REDUP-bone
'The dogs sniff the bones'

(b). hix-yím-ɬ ʔas-ʔús-ɬ ts'i-ts'í:p
REDUP-sniff-CONN REDUP-dog-CONN REDUP-bone
'The dogs sniff the bones' (sniffed one bone at a time)

184(a). ʔax-ʔamqó:k^{y}it six-sq'añís
REDUP-remember REDUP-mountain
'The mountains are beautiful (or worth remembering)'

(b). hix-ʔamqó:k^{y}it six-sq'añís
REDUP-remember REDUP-mountain
'The mountains are beautiful (or worth remembering)'

Note that the (a) and (b) examples were given spontaneously by only one consultant (the oldest consultant, age 60+). Another consultant gave the (a) version for both examples, and for him these were the only possibilities. The explanation given by the consultant who gave both versions of each example is cited below exactly as the consultant gives it: In the (b) version of the first example, the dogs sniffed the bones, one bone at a time. In the (a) version the bones were all together and the dogs sniffed the whole group of bones. In the second example, there is a whole range of mountains and in the (b) version, the speaker wishes to remark that each mountain of the group is beautiful, whereas in the (a) version the remark is made of the mountains as a group.

To the extent that the above explanation reflects a general tendency (present or earlier) in the language, one may wish to claim that the hix prefix on predicates is used to emphasize the individual actions or states indicated by a plural predicate. If this were the case, we would expect the use of this prefix to be more widespread. However, this is not synchronically substantiated. The possibility of its use with the same semantic function on a number of other roots was consistently rejected by all consultants. One might also note that, according to the data given by my oldest consultant, wherever the hix prefix was possible, so was the regular full reduplicative pattern (be it CiC or Cix), but not vice versa. In each case she maintained the semantic distinction.

The preceding discussion allows us to conclude, at most, that the hix prefix with its particular semantic function was perhaps more productive at an earlier stage. What we have now is a relic left on a very limited number of lexical items. In fact, the present data offer no justification for treating the hix prefix as a reduplicative pattern except, of course, for its apparent affinity with the Cix pattern of reduplication.

We claimed in the first paragraph of this section, that there were no semantic differences between the Ci, CiC and Cix reduplicative patterns. There seems to be no clear way of predicting the pattern of reduplication adopted by a particular lexical item. Note I am claiming that it is the pattern of reduplication that is unpredictable, not the processes which do occur within a given pattern. It is possible to note certain general tendencies (e.g. most bi-syllabic roots follow the Cix pattern), but these do not hold throughout. In fact many forms reduplicate according to more than one pattern with no semantic difference. Consider:

185. sip-sí:p-k^{w}-ɬ ŵé:n-i-ŷ

REDUP-hurt-STAT-CONN tooth-EPEN-1s

'My teeth are hurting'

186. six-sí:p-k^{w}-ɬ ŵé:n-i-ŷ

REDUP-hurt-STAT-CONN tooth-EPEN-1s

'My teeth are hurting'

187. k'^{w}is-k'^{w}ás-ɬ m̂ǽ:l-i-ŷ

REDUP-break-CONN canoe-EPEN-1s

'My canoes are broken'

188. k'^{w}ix-k'^{w}ás-ɬ m̂ǽ:l-i-ŷ

REDUP-break-CONN canoe-EPEN-1s

'My canoes are broken'

189. k'^{w}is-k'^{w}ás-ɬ ŵé:n-i-ŷ

REDUP-break-CONN tooth-EPEN-1s

'My teeth are broken'

The above examples can also be adduced as evidence that the phonological shape of the root does not determine the pattern of reduplication. In addition, it can be shown that the reduplicative pattern is not determined by the particular semantic class that a lexical item may belong to. It seems that we must come to the less-than-desirable conclusion that each lexical item is marked for the pattern of reduplication in which it participates. The items which reduplicate according to more than one pattern will then be marked for both patterns, between which they vary freely.

In the latter cases, we have essentially proposed free variation. This notion leads us to address certain questions: (i) Is one of the patterns in question more productive than the other? (ii) Is there any sense of a diachronic shift in the direction of one pattern as opposed to the other?

In arriving at an answer to the first question, let us look at loans which are often a convenient tool for determining productivity. Consider the following phonetically represented examples.

190. bŭts bixbŭts[33] 'boot'

191. swétə six-swétə 'sweater'[34]

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[33] Note that the final <u>ts</u> behaves as an affricate, <u>cf</u>.[bŭdʒiŷ] 'my boot'. Also, recall the discussion in footnote 24 which claims that the voiced counterpart of <u>ts</u> provides evidence that it is an affricate.

[34] Note the lack of voicing on the <u>t</u> and the English stress

192. pénd-i-ŷ bixpénd-i-ŷ[35] 'I paint'

The above examples, which clearly are loans, reduplicate according to the Cix pattern. Note also that for none of these loans was the CiC pattern possible. Evidence from loan words therefore suggests that Cix is the more productive of the patterns CiC and Cix.

Addressing the question of diachronic shift, let us look at the behavior of the Cix pattern. Earlier in this chapter, it was claimed that reduplicative prefixes attach directly to roots. This is true for by far the majority of forms regardless of the pattern of reduplication. There are, however, some deviant derived forms, all of which reduplicate according to the Cix pattern. Consider the following:

193. qan-t'imís qax-qan-t'imís
stick-writing REDUP-stick-writing
'pencil' 'pencils'

194. qan-m̓ála? qax-qan-m̓ála?
stick-fasten REDUP-stick-fasten
'button' 'buttons'

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[34](cont'd)assignment.

[35] Note the following which is tangential to the present discussion, but nevertheless worth noting: The t of this example is voiced in pre-vocalic position, but the pre-vocalic t occurring morpheme-internally in swétə remains unvoiced. Also, in bix-péndiŷ, the p of the root is voiceless like English but voiced in the prefix.

In each of these examples, C_1 of the reduplicative prefix is a copy, not of C_1 of the root, but rather of C_1 of the lexical proclitic. It seems to be the case that the Cix pattern is broadening the base to which it applies from roots to words. Tarpent(1983:194) claims that there is evidence to suggest that plural formation has three distinct stages of evolution. She claims that there is a stage where plurals are built on roots, followed by a stage where they are built on stems and finally, they are built on entire words. The fact that loan words adopt the Cix pattern, and that this pattern appears to include whole words, leads us to think that the Cix pattern represents an open class as opposed to a closed CiC class.

Looked at in terms of Levels, we could perhaps argue that Cix reduplication is not to be considered a Level I process as are the other patterns of reduplication.[36] Note that we claimed in Chapter 1, that proclitics were attached at a level later than the one at which reduplication and uvular deletion occurred. Since Cix reduplication may copy C_1 of a proclitic, then we must order Cix reduplication later than the addition of the proclitics. This is not problematic for our earlier analysis, since the crucial processes involved in the motivation of reduplication as a Level I process were stress and uvular deletion, none of

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[36] Arguments for reduplication as a Level I process were given in Chapter 1.

which interact with Cix reduplication.

Placing Cix reduplication at a later level of the grammar tells us something about its markedness in relation to that of the CiC pattern of reduplication, which is placed at an earlier level. Compare English plural markers. The irregular plurals which represent a closed class are considered to be at Level I, whereas the addition of s or its variants(the productive method of pluralization) is considered a Level II process.[37] Similarly, we can consider the Cix pattern of reduplication the unmarked pattern. Evidence from loans is totally consistent with this claim.

G. SUMMARY OF CHAPTER 2

In this chapter we saw that the many surface manifestations of reduplication types were reducible to fewer patterns. It was shown that these diverse surface types can be accounted for by positing a reduplicative morpheme which has the allomorphs Ci, CiC and Cix. The variations within these types were accounted for by phonological rules, some of which were pervasive processes and others processes restricted to the context of reduplication. In addition, we claimed that the vowel /i/ was part of the reduplicative morpheme, and its alternation entirely predictable through the Vowel Variation rule.

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[37]See Kiparsky 1983.

Finally, we addressed the notion of productivity with respect to pattern of reduplication. In the chapter to follow, we will discuss how Tarpent (1983) proposes to account for the prefix vowel and the various reduplication types.

III. EXAMINATION OF THE REDUPLICATION ANALYSIS IN TARPENT

A. BRIEF OUTLINE OF TARPENT'S TREATMENT OF REDUPLICATION

Tarpent, in her article "Morphophonemics of Nisgha Plural Formation" (1983:133) claims that Nisgha exhibits two major types of reduplication – partial and full (the latter being the more common). Within the major types, there are certain forms which deviate sufficiently from the regular pattern that they appear to warrant a separate classification. Examples are those forms which reduplicate according to the Cix or CV: patterns. In the following two sections, the mechanics of the major reduplication types as proposed by Tarpent will be discussed.

1. PARTIAL REDUPLICATION

The formula for partial reduplication as given in Tarpent (1983:133) is:

$$\#C_1\ldots\# \longrightarrow \#c(v)C_1\ldots\#$$

where c is a copy of C_1 of the root or relatable to it by rule, and v predictable from the adjacent consonants. Note that the vowel of the reduplicative prefix is optional. Tarpent (1983:133) therefore gives the conditions governing the presence of this vowel. She states:

> Vowel Insertion: A vowel is inserted between the two identical consonants at the beginning of a word. If these identical consonants are both resonants, there is no vowel:

$\emptyset \longrightarrow v \;/\; \#C \;\_\_\; C$

$\qquad\qquad [-res]\;[-res]$

Tarpent (1983:134) then follows this by a vowel specification rule which predicts the nature of the vowel. The rule is as follows:

$v \longrightarrow a \;/\; \bar{C}$[38] ___

$\qquad ə \;/\; \_\_\; ʔ$

$v \longrightarrow a \;/\; \_\_\; \bar{C}$

$\qquad u \;/\; \_\_\; C^{W}$ [39]

$\qquad ɨ \;/$ otherwise

In addition to the Vowel Specification rule, Tarpent proposes rules of Consonant Deglottalization and Glide Reduction to h to account for cases where C_1 of the root and prefix are not identical. These rules will be considered in detail later.

2. FULL REDUPLICATION

Tarpent (1983:133) gives this general formula for full reduplication.

$\#C_1VC_2...\# \longrightarrow \#C_1vc_2C_1VC_2...\#$

where:

> c is a consonant identical to or related by rule to the original consonant and where v is a vowel predictable from the consonantal environment...

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[38] $\bar{C}$ is any uvular or glottal consonant.

[39] C^{W} is any labiovelar.

Tarpent (1983:136) proposes to account for the vowel in the prefix by rules of deletion and epenthesis. About the vowel in the prefix, she says:

> This vowel is not then a reduced version or a copy of the root vowel; instead the original vowel has been deleted by a rule of Vowel Deletion, and a new, unspecified vowel inserted as in partial reduplication.

The Vowel Specification rule which applies in partial reduplication also applies here. Rules relating the consonants of the prefix to those of the root are also given. The rules affecting C_1 are Resonant Deglottalization and Glide Reduction to <u>h</u>. Consonant Deglottalization, Velar Fricativization and Deaffrication are the rules affecting C_2.

B. <u>PROBLEMS WITH TARPENT'S ANALYSIS</u>

Tarpent's analysis of Nisgha reduplication is without doubt very detailed. She succeeds in giving a comprehensive treatment of the reduplication types and the phonological processes affecting them. Some aspects of her analysis, however, remain problematic.

1. <u>ARGUMENTS AGAINST A DELETION AND EPENTHESIS ANALYSIS</u>

The deletion and epenthesis analysis employed by Tarpent in full reduplication is also employed in accounting for the change of root vowel in one reduplicative type (<u>cf</u>.

Tarpent 1983:169). In principle, it seems counter-intuitive for deletion and epenthesis rules to occur in the same environment, except, of course, the rules can be clearly and independently motivated. Certainly from the point of view of learnability and opacity, such rules occurring in the same environment seem undesirable. Tarpent provides no motivation for her rules of deletion and epenthesis, thereby making her approach seem rather ad hoc.

In order to remedy Tarpent's approach, her analysis can be altered somewhat by dispensing with the deletion rule and copying only C_1 and C_2 of the root. Such a move can be justified by the fact that the vowel in the reduplicative prefix is not a copy of the root vowel. Under this modified analysis, there is need only for an epenthesis rule to insert a vowel between the copied consonants in the prefix. Initially, it can be argued that a rule of epenthesis seems attractive especially since an epenthesis rule exists elsewhere in the grammar - namely in some word-final consonant clusters. When a violation of the sonority hierarchy is brought about through suffixation, the rule of epenthesis applies, thereby causing the cluster to resyllabify. Consider these examples: [40]

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[40]Note that the vowel variation rule proposed in Chapter 1 accounts for the quality of the epenthetic vowel.

195. mít-ʔn [mít'in]

full-CAUS

'fill'

196. ʔús-n [ʔúsin]

dog-2S

'your dog'

197. ŵé:n-ŷ [ŵé:niŷ]

tooth-1s

'my tooth'

In examples 193 to 195 the offending clusters are ʔn, sn and nŷ respectively. The rule of epenthesis breaks up these clusters.

When one considers more closely the epenthesis rule in the reduplicative prefix, its initial plausibility seems somewhat diminished. This is so for two reasons: first, its function does not exactly parallel that of the otherwise needed epenthesis rule discussed above. The function of the latter is to break up impermissible clusters in codas, whereas, in the case of reduplication, the clusters occur in onsets. Secondly, there is no independent evidence for epenthesis in onsets outside the context of reduplication. Branching onsets do exist in roots. Consider the following previously cited example:

198. sqík^{y}sk^w 'to be injured'

This example reduplicates as:

199. saχ-sqík^{y}sk^w 'to be injured'

One can argue that in the case of example 199, epenthesis applies to break up a cluster of four consonants. However, given that there exist branching onsets made up of two and three consonants (cf. examples 4 and 198), there still is no justification for the insertion of a vowel in the position #C—CCC, as opposed to #CC—CC or #CCC—C.

It seems clear that an analysis adopting both deletion and epenthesis should be abandoned, since it cannot be plausibly motivated. On the other hand, the above argument against epenthesis occurring after C_1, (as opposed to after C_2 or C_3) does not convincingly rule out epenthesis. The argument simply raises a question as to the plausibility of an analysis employing epenthesis.

2. AN ALTERNATIVE TO A DELETION AND EPENTHESIS ANALYSIS

Given that the deletion rule cannot be motivated, it would seem much more plausible to treat the vowel of the reduplicative prefix as part of the reduplicative morpheme. The allomorphs of the reduplicative morpheme would be Ci for partial reduplication, and they would be CiC and Cix for full reduplication. With this approach, we need only the vowel variation rule to account for the surface shape of the vowel. As mentioned earlier, this rule is needed elsewhere for another method of pluralization and to account for the shape of the vowel in the rule of epenthesis which applies in codas. The analysis proposed here eliminates the need for rules of deletion and epenthesis; thus we can account for reduplication with the use of fewer rules.

3. PROBLEMS INTERNAL TO TARPENT'S ANALYSIS

This section will examine some inadequacies of Tarpent's analysis in which the vowel of the reduplicative prefix is accounted for by deletion and epenthesis. The specific problems lie with the formulation of the epenthesis rule. The failing of this rule, as proposed by Tarpent, immediately becomes apparent when we attempt to apply it to two particular reduplication types.

The rule quoted in Section A, Part 1 of this chapter, states that a vowel is inserted between two identical non-resonants at the beginning of a word. The formulated rule is restated here for convenience.

$$\emptyset \longrightarrow V \;/\; \#\underset{[-res]}{C} \;\text{—}\; \underset{[-res]}{C}$$ [41]

There is a discrepancy between the formulated rule and the prose statement of the rule. The former does not index the consonants for identity whereas the latter does. Before attempting to align the two, let us see how the rule, as formulated, applies to the data. In particular, consider the interaction of this rule of Vowel Insertion with the rule of Glide Reduction to h. Tarpent (1983:135) claims that the latter is a general rule of partial reduplication which applies to words beginning with w. The formula she gives is:

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[41]Although Tarpent does not explicitly define her feature [±resonant], it is here assumed to be equivalent to the Chomsky-Halle (1968) feature [±sonorant].

#w...—>#huw...

Tarpent then adds that the vowel is u through the Vowel Specification rule which is given in Section A, Part 1 of this chapter. Note that the Vowel Specification rule applies after the rule of Vowel Insertion (epenthesis). The problem lies in the application of the Vowel Insertion rule in those cases of partial reduplication where C_1=[h]. Consider the ordering of the Vowel Insertion rule, as formulated and the rule of Glide Reduction in the following derivation: [42]

	/wilp/	'house'
Partial Redup.	w	
Vowel insert.	–	(cannot apply; both consonants are resonants)
Glide Red.	h	
Output	*[hwílp]	

Consider the alternative ordering:

	/wilp/	'house'
Partial Redup.	w	
Glide Red.	h	
Vowel insert.	–	(cannot apply; at least one of the consonants is a resonant)
Output	*[hwílp]	

In neither ordering is it possible to have the Vowel Insertion rule apply. The Vowel Specification rule which

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[42] Only the relevant rules are considered in this derivation.

Tarpent claims accounts for the vowel in the prefix of huwilp, presupposes the application of the Vowel Insertion rule which we have shown cannot apply. Tarpent's rule of Vowel Insertion, as formulated, clearly cannot account for the presence of the vowel in the prefix of huwilp.

It was mentioned earlier that Tarpent's formalization of this rule differs from her prose statement of the rule with respect to consonant identity. Note that if the rule were amended so as to index the consonants for identity, the problem in the case of huwilp would still not be solved. The problem lies with the feature [-sonorant] ([-resonant] according to Tarpent) Before a solution is proposed, full reduplication will be examined to determine what consequences it holds for this rule of Vowel Insertion.

Tarpent states that in full reduplication, the original vowel is deleted and a new unspecified vowel is inserted as in partial reduplication. The above-mentioned discrepancy between the two forms of the rule becomes crucial in full reduplication. If Tarpent intends the rule formulation to reflect the consonant identity, as does the prose statement of the rule, then the formulated rule can no more than fortuitously insert a vowel in the prefix. This is the case because after a vowel is deleted from a fully reduplicated prefix, C_1 and C_2 of the prefix then become the potential left and right contexts respectively. It is only under chance circumstances that they would be identical. Note that if the consonants of the rule were marked for identity, the rule would similarly be inapplicable in the case of roots of the form sCVC or ɬCVC which, Tarpent (1983:136) claims, reduplicates fully with s or ɬ as C_1 and the following consonant as C_2. In all the cases of full reduplication, it seems that the consonants constituting the left and right contexts of the Vowel Insertion rule cannot be marked as identical, despite the fact that the prose statement of the rule specifies that they are.

Consider now these cases for which Tarpent's feature [-resonant] also proves to be problematic, as it did in the case of partial reduplication. Tarpent (1983:136) gives the forms cited below:

200. m̓án	minm̓án[43]	'to smear a substance'
201. m̓ál	milm̓ál	'to fasten, button something'

In these examples, a vowel can never be inserted in the prefix since both C_1 and C_2 are resonants. In addition, the rule also fails in cases of full reduplication where there is glide reduction to h, resulting from roots beginning with the glide y, as in these examples taken from Tarpent (1983:137).

202. lu:yáltk^W	lu:hilyáltk^W	'to turn around'

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[43]The lack of glottalization on C_1 of the prefix of these examples is accounted for by Tarpent's Consonant Deglottalization rule.

203. yánk^{w} hinyánk^{w} 'to be mouldy'

It has been shown that the rule of Vowel Insertion is problematic on two counts: first with respect to the discrepancy mentioned above, and secondly with respect to the feature [-resonant]. In order to rectify the discrepancy, we can propose indexing the consonants in the formulated rule. If we do, then the rule does not work in cases of full reduplication. If we change instead the stated rule to allow vowel insertion between any two non-resonants (rather than identical non-resonants), then the rule is still problematic with respect to the feature [-resonant] in cases like <u>minm̓án</u>,<u>milm̓ál</u> and <u>huwílp</u>. It seems that if we were to adopt the Vowel Insertion rule, we need to amend it so that it includes in its environment, everything except identical resonants. In other words, vowel insertion will take place in all instances except between identical resonants. Tarpent's approach modified in this way will then observationally account for the data provided that the glide reduction rule is crucially ordered before vowel insertion.

C. HOW THE PRESENT ANALYSIS DIFFERS FROM TARPENT'S

The analysis presented in this thesis and that of Tarpent differ strikingly in some ways. This section will examine some of the major differences of the two approaches.

1. DIFFERENCES IN THE GENERAL MECHANICS OF THE TWO APPROACHES

One of the principal differences between Tarpent's analysis and the present one lies in the method of accounting for the vowel in the prefix. As a consequence, the overall mechanics whereby reduplication proceeds are altogether different in the two approaches. This applies both to full and partial reduplication.

In contrast to Tarpent's analysis of partial and full reduplication, the present analysis proposes a reduplicative template of which the vowel (to appear in the reduplicative prefix) is a part. In the case of partial reduplication the template is Ci, and CiC in the case of full reduplication. This analysis then proposes that only consonants are copied from the root. Comparable to Tarpent, the surface form of the vowel is predictable from the Vowel Variation rule.

Earlier in this chapter, it was shown that there are problems internal to Tarpent's analysis with respect to the Vowel Insertion rule. Aside from this fact, her analysis is less efficient than the one presented here in the following ways.

First, Tarpent states all modifications on the consonants in reduplication as general rules, thus failing to capture the fact that some of these rules apply only in reduplicated forms. In particular, the phenomena of deglottalization and deaffrication are observable only within the context of reduplication and it would be desirable to capture this fact. Chapter 4 will show that by the use of a reduplication template with certain pre-attached features, it is possible to capture a generalization, namely that deglottalization of consonants is unique to reduplicated forms. In Chapter 4, we will also make some proposals for handling deaffrication, although the analysis remains problematic in some respects.

Secondly, Tarpent treats Cix reduplicative types as having an infix ix. In the present analysis, the Cix pattern, although a separate allomorph of the reduplicative morpheme, can be handled by a CiC template with preattached features on C_2. This will be made explicit in Chapter 4. Note that, according to Tarpent's analysis, Cix reduplication must proceed by completely different means from that of CVC reduplication. In the former, C_1 alone is copied and it is followed by an infix ix. In the latter case, the vowel is copied along with the consonants.

In addition to the above differences, there are differences between some of the data cited by Tarpent and those of this study. This divergence in data is very revealing. Tarpent (1983:159) cites the following examples which reduplicate according to the Cix pattern.

204. qaqítk^w k^{y}ixqaqítk^w 'to be difficult, expensive'

205. qaq'ítk^w k^{y}ixqaq'ítk^w 'to howl'

206. q'amk^{w}í:tk^w k^{y}ixq'amk^{w}í:tk^w 'to bless, baptize somebody'

According to Tarpent, the i of the infix ix is incompatible with an initial q or q'. Therefore instead of the vowel adjusting as it does in the Vowel Specification rule, the uvular fronts so as to be compatible with the following vowel.

Consider now these examples which form part of this study:

207.	q'alté:xk^w	q'axq'alté:xk^w	'to shiver'
208.	qanm̓ála?	qaxqanm̓ála?[44]	'button'
209.	q'amk^{w}í:tk^w	q'axq'amk^{w}í:tk^w[45]	'to baptize'

Note that the two sets of data permit some very different analyses. The fact that the prefix vowel never varies in Tarpent's data, but, instead the consonant adjusts to the vowel in instances of incompatibility, makes this type of reduplication different from the other types. Note that in this case, the vowel is not conditioned by the adjacent consonants as in the Vowel Specification rule. On the other hand, the data from the present study suggest that the vowel of Cix plurals is no different from the vowel of CiC or Ci patterns and is likewise subject to the Vowel Variation rule.

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[44]Tarpent cites qanmilm̓ála?.

[45]cf. example 206.

2. DIFFERENCES IN ANALYSIS OF REDUPLICATION TYPES

Consider first the partial and full reduplication types which reduplicate with C_1 as h or h̄ when the roots of partially reduplicated forms begin with w and the roots of fully reduplicated forms begin with y.[46] Below are examples, some of which have been previously cited.

210.	wá	h̄uwá	'name'
211.	wílp	h̄uwílp	'house'
212.	yáts	h̄isyáts	'to chop'
213.	yáɬkʷ	hiɬyáɬkʷ	'slippery'

The analysis offered here proposes that glides become [h] when followed by homorganic vowels.

On the other hand, Tarpent (1983:135) claims that C_1 is the result of a Glide Reduction to h rule. The formula she gives is

#w... —> #huw...

She also claims that a similar formula exists in full reduplication for words beginning with ya. Note that in Tarpent's analysis the formula[47] has to be stated separately for the partial and full reduplication forms, whereas the Glide to 'h' rule in the present analysis can take care of both cases. The proposed rule is restated here for reference:

----

[46] According to Tarpent ya.

[47] Tarpent does not explicitly state the formula for the full reduplication forms.

$$\begin{bmatrix} -\text{cons} \\ -\text{voc} \\ +\text{hi} \\ \beta\text{back} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{cons} \\ +\text{lo} \\ -\text{back} \\ -\text{rd} \end{bmatrix} \; / \; \text{—} \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ +\text{hi} \\ \beta\text{back} \end{bmatrix}$$

In addition, it appears that to have a formula that applies only to ya forms is not entirely accurate. Among Tarpent's data (cf. note 20) is the following form in which aspectual reduplication occurs.

214. yé: 'go, walk' hiyé: 'to be going, walking'

It seems from the above example that the formula should not be limited to forms beginning with ya (as Tarpent does). The Glide to 'h' rule proposed in this thesis can handle the above example as well as the others, since only C_1 of the root (and not the root vowel) is part of the context of the rule.

The differences in the two approaches also come out forcefully in the analysis of $C\check{V}$: reduplication types. The formula given in Tarpent (1983:167) for this type is:

$C\check{V}K$[48] —> $C\check{V}{:}CvK$[49]

In this type, she claims that the root vowel is copied into the reduplicative prefix and the original vowel is deleted from the root and a new vowel inserted into the root. The

----

[48]K=Velars, Uvulars and Glottals.

[49]v=an epenthetic vowel specified by the Vowel Specification rule.

original C_2 spirantizes and through a series of processes deletes, leaving length on the preceding vowel. In order to account for the presence of stress on the prefix vowel, Tarpent (1983:168) compares the reduplicated forms to others in which uvular deletion takes place. She cites the following:

215. *páχ-n —> pá:n 'run!'
run-2s

216. *nóχ-n —> nó:n 'your mother'
mother-2s

217. *nóχ-ŷ —> nó:ŷ 'my mother'
mother-1s

218. *ʔan-lu:-tóχs —> ʔanlu:tó:s
'drawer'
place of-in-put

She then states:

> Note that in these examples the rule affects x̌[50] after stressed vowel, as in the present plural examples, showing that stress assignment on the first syllable must have occurred before fricativization.

The essence of Tarpent's argument is that since in the above examples the uvular fricative is deleted after a stressed vowel, then this provides evidence that the stress assignment on the first syllable of the CV̌: reduplication type must have occurred before fricativization and

----

[50] x̌=χ, the uvular fricative.

consequently before deletion. There seem to be at least two problems with this argument.

First, the argument is circular. Tarpent states that in the examples given above, the deletion rule affects x̲ after a stressed vowel "as in the present plural examples". However in the plural examples, it is not clear that the vowel is stressed at the time of uvular deletion; in fact that is the very point that needs to be proved. Tarpent therefore comes to the ill-founded conclusion that stress must have been present on the first syllable before fricativization occurred.

Secondly, her treatment of the CV́: reduplication type is deficient in that it does not state how stress is assigned on the first syllable. In other words, is stress shifted on to the first syllable and if so, what are the conditions causing the shift? Another possibility is that stress is assigned directly to the prefix. If this is the case, the question arises as to why stress is assigned to the prefix rather than to the root as happens in other cases.

Consider, in contrast, the analysis of CV́: reduplication offered in this thesis. CV́: types are treated as a form of CiC reduplication in which the rule of uvular deletion applies to C_2, causing length to remain on the vowel. The major difference in the two analyses is that within this analysis, nothing need be said about stress on the first syllable, since it falls out of the general stress rule (as was shown in chapter 2). Recall that the stress rule will assign stress to the rightmost long vowel of a Level 1 string.

3. DIFFERENCES PERTAINING TO CONSONANT DEGLOTTALIZATION

Tarpent posits three rules of deglottalization. One rule of Consonant Deglottalization applies only to C_1 of partially reduplicated forms as in:[51]

219. m̓á:l   mm̓á:l   'canoe'

220. ts'ak'^{y} tsits'ák'^{y} 'plate, dish'

A second rule of deglottalization applies only to resonants in C_1 position of fully reduplicated words as in the following:

221. m̓án   minm̓án   'to smear a substance'

222. m̓ál   milm̓ál   'to fasten, button something'

The third rule applies to all consonants in C_2 position. For example:

223. tám̓   timt'ám   'to press something'

224. ts'ál'   ts'ilts'ál'   'face, eyes'

225. hít'   hathít'   'to stick'

The data collected in this study support only a rule of Resonant Deglottalization in C_2 position of the prefix. Although Tarpent claims that all consonants are deglottalized in C_2 position, all her examples with the

----

[51]Unless otherwise indicated the examples in this section are cited according to Tarpent (1983).

exception of example 225[52] are ones in which C_2 is a resonant. Neither the first nor second rule of deglottalization can be corroborated by the data in this study. In each case the examples show glottalization on the relevant consonants. Consider:

226. ts'ák ts'its'ák 'dish, plate'

227. ɬim̓ó:l' ɬim̓ilm̓ó:l' 'to wrap something'

228. m̓alk^{y}ék^{y}sk^w m̓ilm̓alk^{y}ék^{y}sk^w 'heavy'

D. <u>SUMMARY OF CHAPTER III</u>

Chapter III examined the major differences between Tarpent's approach and the present one. In summary, let us tabulate the strategies of the two approaches.

Redup. Types.	Tarpent	Present Study
Partial Redup.	Copy C_1 and insert vowel under certain conditions and specify by Vowel Spec rule.	Use Ci template and Vowel Variation rule
Full Redup. (C_1 and C_2 of root and prefix identical)	Copy CVC; delete vowel;insert new vowel specified by Vowel Spec. rule.	Use CiC template and Vowel Variation rule.

----

[52]Note that in this study this morpheme appears in a form such as [hí:t'ən] which results from /hi:t-ˀn/ (stick-CAUS). If the underlying representation is as indicated here, then C_2 of the prefix will not show glottalization.

CV̌:	Copy C_1 and C_2 and root vowel; insert new vowel specified by Vowel Spec. rule. C_2 spirantizes then deletes. Unclear whether stress shifts to prefix <u>or</u> is assigned there originally.	Use CiC template and Vowel Variation rule. C_2 spirantizes and deletes.
Cix	Copy C_1 of root and follow it by infix <u>ix</u>. When C_1 is uvular it becomes k^y.	Use CiC template with preattached features on C_2 and Vowel Variation rule.

It is worth reiterating here that the analysis offered in this thesis employs two basic strategies in accounting for the reduplication types, whereas Tarpent's analysis essentially employs a different strategy for each different surface type.

Chapter 4 will show exactly how the templates proposed in Chapter 3 account for the various reduplication types as we offer an autosegmental treatment of reduplication.

IV. AN AUTOSEGMENTAL TREATMENT OF NISGHA REDUPLICATION

A. OVERVIEW OF THE THEORETICAL TREATMENT OF REDUPLICATION

In this section, we will summarize the recent treatment of the process of reduplication. Such an account necessarily cannot be exhaustive, but will simply highlight the salient points which have proved to be most crucial to the advancement of a theory of reduplication.

In the past, reduplication was regarded as a purely concatenative process, and reduplicative processes were accounted for in the traditional framework of the Standard Theory by the use of transformational rule notation. However, in the recent literature, the problems with this treatment of reduplication have been pointed to and attempts have been made to formulate a more adequate theory of reduplication. I refer in particular to McCarthy (1981), Marantz (1982) and Levin (1982) as recent sources on this topic.

According to Marantz, the major problem in accounting for reduplication by means of transformational notation is that this device predicts many types of reduplicative patterns (e.g. mirror-image reduplication rules) which never do actually occur. This notational device therefore seemed too powerful and led Marantz to search for a theory of reduplication which would account for all and only the patterns of reduplication attested cross-linguistically. Marantz therefore adapts McCarthy's treatment of the Arabic verbal system (McCarthy 1981)[53] to account for reduplication processes since this approach, he claims, lacks the excessive power of the transformations, while treating reduplication as a normal rule of affixation (which Marantz claims it is). Following McCarthy, Marantz claims that words are to be represented as consisting of tiers, one of which is a consonant-vowel skeleton (henceforth C-V skeleton) which is connected to another tier consisting of phonemic melodies. Adopting this notion of skeleta, Marantz therefore analyzes reduplication as the affixation of a C-V skeleton, itself a morpheme, to a stem - hence the autosegmental approach to reduplication. The mechanics of Marantz's approach and the relevant principles of autosegmental phonology will be given below when we attempt to apply the theory to the Nisgha data and see what implications these data hold for the theory.

B. NISGHA REDUPLICATION IN MARANTZ'S FRAMEWORK

Recall that Chapter 2 proposed that the reduplicative morpheme had three allomorphs[54] – Ci, CiC and Cix. In Chapter 3, it was claimed that these allomorphs can be handled by the use of the Ci and CiC templates. The latter

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[53]For a review of McCarthy's treatment of Arabic verbs, see Marantz (1982:440).

[54]Note these allomorphs are not relatable phonologically; they are morphologically conditioned allomorphs.

would have preattached features on C_2 to account for the cases of Cix reduplication.

Following Marantz's approach of regarding reduplication as the affixation of a C-V skeleton, let us translate these templates into C-V skeleta. The skeleta would be CV and CVC for partial and full reduplication respectively. Just as we proposed to account for Cix reduplication by the use of pre-attached features on C_2, so too can we propose a complex of pre-attached features on V of the skeleton. These would be the features that define V and C_2 as /i/ and /x/ respectively. Very generally, then, we may represent Nisgha partial and full reduplication as (i), (ii) and (iii) below:[55]

```
                   X Y Z
                   | | |
(i)     C V +      C V C
          |
          i

                   X Y Z
                   | | |
(ii)    C V C +    C V C
          |
          i
```

---

[55]Note that in (i), (ii) and (iii) the C-V tier of the stem is attached to another tier, namely the phonemic melody. Each member of the phonemic tier consists of the complex of features that comprise a particular phoneme. In (i), (ii) and (iii) the feature complexes are represented as X,Y and Z.

```
                X Y Z
                | | |
(iii) C V C  +  C V C
        | |
        i x
```

Since the reduplicative affix is dependent on the phonemic melody of the stem, Marantz proposes to copy the entire phonemic melody of the stem on the same side of the stem melody to which the affix is attached. This would be the left side in the case of Nisgha. The copied phonemic melody is then linked to the affixed skeleton according to the following four general conditions taken directly from Marantz (1982:446).

Condition A: Unless overridden by a special proviso, feature complexes containing the feature [-syllabic] can be linked only to C slots in the skeleton, and feature complexes containing the feature [+syllabic] can be linked only to V slots in the skeleton.

Condition B: After as many phonemes as possible are linked to C–V slots one to one in accordance with other conditions and principles, extra phonemes and C-V slots are discarded. There is no multiple attachment of phonemes to C-V slots or of C-V slots to phonemes.

Condition C: The slots in a C-V skeleton may be preattached to distinctive features. These features take precedence over the features of any phonemes from a phonemic melody which may link to these slots.

> Condition D: (i) Linking of the phonemic melody to the reduplicating skeleton either begins with the leftmost phoneme of the melody linking to the leftmost C-V slot in the skeleton eligible under Condition A and proceeds from left to right or begins with the rightmost phoneme of the melody linking to the rightmost C-V slot of the skeleton and proceeds from right to left. In the unmarked case, reduplicating prefixes associate with their melodies from left to right, reduplicating suffixes from right to left. (ii) The association of phonemic melodies and C-V reduplicating affixes is "phoneme-driven" in the sense that for each phoneme encountered linking from left to right or from right to left, the association procedure scans along the skeleton to find a C-V slot eligible for association with the phoneme under Condition A.

In addition to the above conditions, there is the fundamental constraint of autosegmental phonology that association lines may never cross.

Let us now apply the above principles, as proposed by Marantz, to the Nisgha data. Note that the phonemic melody actually consists of feature complexes, but in the following derivations, the phonemic symbols are used partly for ease of representation and partly for their mnemonic value.

Unless otherwise indicated, the unmarked direction of linking is employed in the derivations; also, allophonic rules will be assumed but not detailed in the derivations.

1) Ci Reduplication

```
229. Root                                  ts'ak        'dish'
                                           |  ||
                                           C  VC

Affix CV skeleton           CV +
                             |
                             i

Copy phonemic               ts'ak
     melody of stem

Association                 ts'ak + ts'ak
                            |  |    |  ||
                            C  V    C  VC
                               |
                               i

Stress                                       ´
Output                         ts'its'ák
```

According to Condition C, the pre-attached features on the C-V skeleton override the features from the melody, hence the vowel /i/ in the reduplicative affix. Note that in this case the Vowel Variation rule applies vacuously. Also, by Condition B, any unattached phonemes or C-V slots are discarded; therefore /k/ of the copied phonemic melody is discarded and unrealized on the surface because it has no skeletal slot with which to associate.

2) CiC Reduplication

Cases where C_1 and C_2 of prefix and root are identical can be accounted for straightforwardly. The cases in which consonant modification occurs, will be considered in the derivations to follow.

(a) C_2 Spirantization

In Chapter 2, cases of C_2 spirantization were discussed. Recall that there were examples of both uvular and velar spirantization in C_2 position of the reduplicative prefix. Let us examine a derivation exemplifying this process. In this derivation we will also see how roots of the form CCV... reduplicate.

230.Root	sqik^{y}sk^w CCVC CC	'to be injured'
Affix skeleton	CVC +	
Copy phonemic melody of stem	sqik^{y}sk^w+	
Association	sqik^{y}sk^w+ sqik^{y}sk^w CVC + CCVC CC i [−glott constr]	
Vowel Variation	a	
Uvular Spirantiz.	χ	
Stress	´	
Output	saχsqíksk^w	

Note that the vowel of the copied phonemic melody cannot associate with the V slot of the skeletal tier because this would involve the crossing of association lines. According to Autosegmental Theory, association lines may never cross.

(b) C_2 Deglottalization

In Chapter 3 we noted that the deglottalization of a consonant was a phenomenon observed only within the context of reduplication and that it would be desirable to capture this observation. Since there exists the facility of having pre-attached features on members of the C-V skeleton, we can use this to handle cases of consonant deglottalization by proposing a feature [-glottal constriction] on C_2 of the reduplicating morpheme. This feature will prevail in accordance with Condition C. This can be posited pervasively for CiC reduplication whether or not C_2 of the root is a glottalized consonant. In cases where C_2 of the root is not a glottalized consonant, the feature will, of course, be redundant. Consider the following example:

```
231. Root                       ts'al'       'face, eye'
                                |  | \
                                C  V C

Affix CVC skeleton          C V C  +
                              |  \
                              i [-glott]
                                [constr]

Copy phonemic               ts'al'
     melody of stem

Association                 ts'al' + ts'al'
                             \  \\     |  ||
                             C  VC  +  C  VC
                                |\
                                i [-glott]
                                  [constr]

Vowel Variation               i (applies vacuously)

Stress                                   ´
```

Output ts'ilts'ál'

(c) C_2 Affricate Split

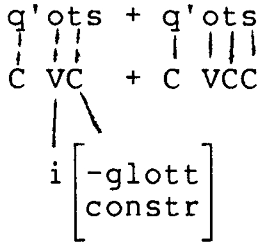
These are the cases where C_2 deaffricates when reduplicated. For example q'óts/q'asq'óts; yátł'/hiłyátł'. These cases seem to be problematic for Marantz's approach. Let us examine the outcome if we attempt a derivation such as in the previous example. The form below reduplicates as [q'asq'óts].

```
232. Root                         q'ots'        'to cut'
                                  | | |
                                  C V C

Affix CVC skeleton          C V C  +
                              | \
                              i [-glott]
                                [constr]

Copy phonemic               q'ots'
     melody of stem

Association                 q'ots + q'ots
                            | ||     \ \|
                            C VC  +  C VC
                              | \
                              i [-glott]
                                [constr]

Vowel Variation               a

Stress                                 ´

Output                      *q'atsq'óts
```

Clearly the above derivation yields the incorrect output. Let us consider some other options.

The fact that the affricate splits in C_2 position of the prefix seems to suggest that the affricate is functioning as a sequence of sounds rather than as a unit. Let us entertain this possibility temporarily and see how the copied phonemic melody will associate with the skeleton. The rules of vowel variation and stress are assumed.

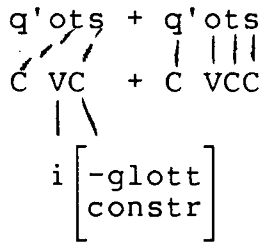
Association



Output *q'atq'óts

The above association follows the unmarked direction of linking (i.e. left to right) as proposed in Marantz's Condition D. If we propose instead the marked direction of association for prefixes (i.e. right to left), the outcome would be:

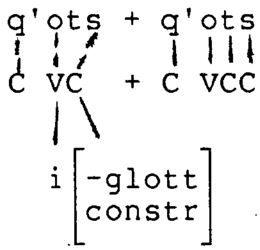
Association



Output *tsq'óts

Given condition D which states that linking is phoneme-driven, then a right to left direction of linking also produces the above incorrect output. Note that C_1 of the prefix has no skeletal member to which to link, and the prefix vowel cannot link to V of the skeletal tier, since this would involve the crossing of association lines. Alternatively, we could propose that linking is right to left and skeletally driven. Note that this represents a departure from Marantz's Condition D which stipulates that linking is phoneme-driven. The proposal that linking be skeletally driven is in keeping with the original constraints on linking (cf. Goldsmith (1976)). Let us consider a right to left, skeletally driven association.

Association

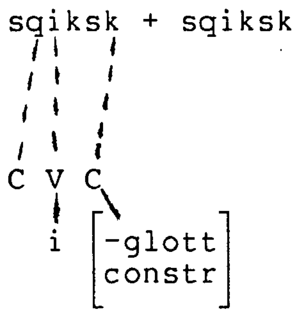


Output q'asq'óts

Note that this approach yields the correct ouput and could possibly be adopted if the directionality of linking and the skeletally driven association held for reduplication throughout. It turns out that it does not. Consider the following form which reduplicates as [saχsqíksk^{w}].

Association

(right to left and skeletally driven)



It is obvious that the above association cannot produce the correct form.

Even if a right to left direction of linking and a skeletally driven association were possible, we are still left with the fundamental problem that such association assumes that the affricate functions as a sequence rather that a unit. Elsewhere in the phonology it behaves as a unit (cf. footnote 24).

If indeed the affricate is to be treated as a unit, then perhaps the affricate split in C_2 position of the prefix can be viewed from a somewhat different perspective. Recall that in Chapter 2, Section D, some type (iv) cases involved the spirantization of uvulars and velars in C_2 position of the prefix. It was claimed there, that the uvulars and velars became [+continuant] in coda position when followed by a consonant. Likewise, we could possibly claim that the affricates become [+continuant] in the identical environment. The claim would then be that:

$$\begin{bmatrix} q \\ k \\ ts \\ t\text{ɬ}' \end{bmatrix} \longrightarrow [+\text{cont}] \;/\; \begin{array}{cc} \text{R} & \text{O} \\ \backslash & | \\ \_\_ & \text{X} \end{array}$$

There are, however, some problems with this approach. First, the input to the above rule cannot be readily characterized as a natural feature class. A second and more grave problem is that deaffrication has a much more limited domain of application than does uvular spirantization. Note that deaffrication is restricted to the context of reduplication. There exist forms such as q'óts-tit, 'they cut', (cut-3pl) in which the affricate is in coda position and adjacent to a consonant. This disparity in domain of application is a compelling argument against merging the processes into a single rule.

Since the rest of the phonology supports a treatment of the affricate as a unit, then it seems that we must link as was done in the initial derivation, but, in addition, we need a non-ad hoc mechanism for getting rid of the stop quality in the affricate. I know of no way of achieving this, given the current status of the theory. Perhaps a prohibition of the feature [+delayed release] on C_2 of the prefix holds some promise of a solution. The implementation of this mechanism is clearly an avenue for future research.

(d) Uvular or Velar Deletion of C_2

These are cases which reduplicate on the surface as (CV̂: + C...), after uvular or velar deletion of C_2 has occurred. The example below reduplicates as [lá:laqs] Let us examine a derivation of this form.

```
233. Root                            laqs          'to bathe'
                                     ||||
                                     CVCC

Affix CVC skeleton             C V C  +
                                 | \
                                 i [-glott]
                                   [constr]

Copy phonemic                  laqs
     melody of stem

Association                    laqs + laqs
                               |||    ||||
                               CVC  + CVCC
                                | \
                                i [-glott]
                                  [constr]

Vowel Variation                 a
```

At this stage of the derivation, the uvular deletion and compensatory lengthening would occur, followed by stress assignment. The problem, however, lies with accounting for uvular deletion and compensatory lengthening in Marantz's framework. Let us attempt to account for these phenomena according to Marantz's principles. At the present stage of the derivation we have:

```
laqs + laqs
|||    ||||
CVC  + CVCC
```

In order to delete the uvular in the prefix, we erase the association line linking it to the skeletal tier. The result is therefore:

```
laqs + laqs
||     ||||
CVC  + CVCC
```

In Autosegmental theory, compensatory lengthening can be accounted for by spreading, i.e. the vowel will spread to associate with the slot from which the uvular was deleted. Note, however, that this is not possible, given Marantz's Condition A which disallows the linking of a feature complex containing the feature [+syllabic] with a C slot in the skeleton. In order for Marantz to account for this phenomenon, he would need to invoke a special proviso (cf. Condition A) to permit the type of linking necessary. It is the use of precisely such ad hoc provisos that argue for an empty skeletal tier consisting of a series of points, as utilized by Lowenstamm and Kaye (1983). Even with the implementation of a special proviso, the analysis is not possible for Marantz, since Condition B prohibits multiple attachment of C-V slots to phonemes and vice versa.

Let us examine how uvular deletion and compensatory lengthening can be handled by employing a skeletal tier consisting of a series of points which are represented as XXX.

```
Uvular Deletion:          laqs + laqs
                          ||     ||||
                          XXX  + XXXX
```

We are then left with an unattached slot from which the uvular was disassociated. The vowel is now free to spread to this empty slot.

```
Compensatory Length.:     laqs + laqs
                          |/\    ||||
                          XXX  + XXXX
```

The output of the compensatory lengthening rule is now subject to the assignment of primary stress (cf. Chapter 1: Section D and Chapter 2: Section D, Type (vi)), yielding the correct output i.e. [lá:laqs].

Note that the above account is not possible within Marantz's framework, since there are no provisions for either empty slots on the skeletal tier or for multiple linking. These cases of long vowels in the prefix are a real problem for Marantz's framework. Marantz represents long vowels as either a series of two V's or by the use of a preattached feature [+long] on a single V.[56] Neither of

----

[56]The particular representation that he chooses is determined by language-specific parameters.

these approaches is possible for the pattern of reduplication in question. The first approach is only possible if the root contains a long vowel which is to be treated as a series of two vowels and copied as such when the phonemic melody is copied. The second approach would predict that all the other patterns of full reduplication contain a long vowel in the prefix. The data provide evidence against both approaches.

A final possibility would be to propose a separate template, namely CV[+long]C[57] to handle <u>CV̂:</u> reduplication. Clearly, this adds needless complication to the grammar, and treats uvular deletion and vowel length in these cases as independent and unrelated phenomena. We have evidence to the contrary outside the context of reduplication (<u>cf</u>. Chapter 1: Section E). Even more compelling evidence against the use of a preattached feature [+long] on V of the skeletal tier can be found in an examination of roots in which uvular deletion and compensatory lengthening occur. For these cases, we would have to propose that the root is represented in the lexicon by two allomorphs, one of which is attached to a skeletal tier of the form CVC, the other to a skeletal tier of the form CV:. We would then have no way of relating these allomorphs in the lexicon, thereby missing a generalization.

----

[57]Note that C_2 must be included as part of the template, since it conditions the vowel in the Vowel Variation rule.

(3) Cix Reduplication

Forms reduplicating according to this pattern behave essentially like those employing the CiC pattern, except that C_2 of the affixed skeletal tier has preattached to it the complex of features that comprise /x^y/.[58] Consider the following derivation:

```
234. Root                          ts'oʔ    'to skin (an
                                   |  ||     animal)'
                                   C  VC

Affix skeleton               CVC    +
                              ||
                              ix^y

Copy phoneme                 ts'oʔ +
    melody of stem

Association                  ts'oʔ  +ts'oʔ
                             |   ||    |  ||
                             C   VC    C  VC
                                 ||
                                 ix^y

Vowel Variation                  i     (applies vacuously)

Stress                                    ´

Output                         ts'ixts'óʔ
```

Note that the preattached features of C_2 of the skeletal tier prevail over the features from the phonemic melody.

----

[58]Note that/x^y/ surfaces in C_2 of the reduplicative prefix as [x]. This is due to the depalatalization rule given in Chapter1: Section B, Part 4.

C. IMPLICATIONS FOR MARANTZ'S THEORY AND CONCLUSION

Nisgha provides clear examples for deciding an issue left unresolved in Marantz (1982:449). Marantz states that since, according to Condition D, preattached features take precedence over any features from the phonemic melody, we could plausibly adopt the approach of not linking a phoneme to a member of the skeletal tier which has a full set of preattached features. On the other hand, we may still link such items, allowing Condition C to come into play. Marantz points out that the two approaches make very different predictions for certain situations, none of which he was able to find in real-language data. It turns out that Nisgha CiC reduplication provides just such data. Recall that in Chapters 2 and 3, we argued for an analysis in which the vowel is treated as part of the reduplicative morpheme. This being the case, the vowel of the reduplicative morpheme was represented on the V slot of the affixed skeleton as a preattached complex of features on V. This, then, is exactly the type of cases to which Marantz refers. Marantz (1982:450) cites the following hypothetical data to illustrate the two approaches.

```
235. tasidu     tasidu
     ||| \      ||||||
     CVCCV  +   CVCVCV    =tani-tasidu
        |
        n

236. tasidu     tasidu
     || \\      ||||||
     CVCCV  +   CVCVCV    =tansi-tasidu
        |
        n
```

Now consider a Nisgha CiC reduplication case.

```
237. tsip       tsap   'to make, build'
     | | |      | | |
      CVC   +    CVC   =tsip-tsáp
      | \
      i [-glott ]
        [constr ]

238. tsip   +   tsap
     \          | | |
      CVC        CVC   =*ts-tsap
      | \
      i [-glott ]
        [constr ]
```

Note that in the second case, if we do not link the vowel on the phonemic tier to V with the full set of preattached features, then the vowel in the phonemic tier will be discarded because it has no skeletal element to which to link. Not only will the vowel be discarded, but so will the following consonant, since association ceases when a phoneme is unable to link to a skeletal member. The consonant will therefore never be allowed to associate. If this is the case, C_2 will never be able to reduplicate. Clearly, this is not the case. Nisgha therefore provides evidence in favour of linking a phoneme to a slot with a full set of preattached features.

In addition, we saw, in Section B above, that the cases of deaffrication of C_2 were problematic for Marantz's theory. It turns out that these examples present a problem for Autosegmental theory as a whole, since, to the best of my knowledge, no currently articulated framework can handle these cases. These cases I leave unresolved, awaiting insight from further research.

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VI. APPENDIX I

A. CONSONANT FEATURE MATRICES

	p	p'	t	t'	k^y	k^{y}'	k^w	k^{w}'	q	q'	ʔ
Conson.	+	+	+	+	+	+	+	+	+	+	+
Vocalic	−	−	−	−	−	−	−	−	−	−	−
Sonorant	−	−	−	−	−	−	−	−	−	−	−
Nasal	−	−	−	−	−	−	−	−	−	−	−
Contin.	−	−	−	−	−	−	−	−	−	−	−
Voice	−	−	−	−	−	−	−	−	−	−	−
Del.Rel.	−	−	−	−	−	−	−	−	−	−	−
Strident	−	−	−	−	−	−	−	−	−	−	−
Back	−	−	−	−	−	−	+	+	+	+	−
Coronal	−	−	+	+	−	−	−	−	−	−	−
Round	−	−	−	−	−	−	+	+	−	−	−
Low	−	−	−	−	−	−	−	−	+	+	+
High	−	−	−	−	+	+	+	+	−	−	−
Glot.Const.	−	+	−	+	−	+	−	+	−	+	−
Anterior	+	+	+	+	−	−	−	−	−	−	−

	m	m̀	n	ǹ	l	l'	y	ỳ	w	ẁ
Conson.	+	+	+	+	+	+	−	−	−	−
Vocalic	−	−	−	−	−	−	−	−	−	−
Sonorant	+	+	+	+	+	+	+	+	+	+
Nasal	+	+	+	+	−	−	−	−	−	−
Contin.	−	−	−	−	+	+	+	+	+	+
Voice	+	+	+	+	+	+	+	+	+	+
Del.Rel.	−	−	−							
Strident	−	−	−	−	−	−	−	−	−	−
Back	−	−	−	−	−	−	−	−	+	+
Coronal	−	−	+	+	+	+	−	−	−	−
Round	−	−	−	−	−	−	−	−	+	+
Low	−	−	−	−	−	−	−	−	−	−
High	−	−	−	−	−	−	+	+	+	+
Glot.Constric.	−	+	−	+	−	+	−	+	−	+
Anterior	+	+	+	+	+	+	−	−	−	−

	s	ɬ	x^y	x^w	χ	h	ts	ts'	tɬ'
Conson.	+	+	+	+	+	−	+	+	+
Vocalic	−	−	−	−	−	−	−	−	−
Sonorant	−	−	−	−	−	−	−	−	−
Nasal	−	−	−	−	−	−	−	−	−
Contin.	+	+	+	+	+	+	−	−	−
Voice	−	−	−	−	−	−	−	−	−
Del.Rel.							+	+	+
Strident	+	−	−	−	+	−	+	+	−
Back	−	−	−	+	+	−	−	−	−
Coronal	+	+	−	−	−	−	+	+	+
Round	−	−	−	+	−	−	−	−	−
Low	−	−	−	−	−	+	−	−	−
High	−	−	+	+	−	−	−	−	−
Glot.Constric.	−	−	−	−	−	−	−	+	+
Anterior	+	−	−	−	−	−	+	+	+

B. <u>VOWEL FEATURE MATRIX</u>

	i	i:	e	e:	u	u:	o	o:	a	a:
Conson.	−	−	−	−	−	−	−	−	−	−
Vocalic	+	+	+	+	+	+	+	+	+	+
Sonorant	+	+	+	+	+	+	+	+	+	+
Back	−	−	−	−	+	+	+	+	+	+
High	+	+	−	−	+	+	−	−	−	−
Round	−	−	−	−	+	+	+	+	−	−

VII. APPENDIX II

The following is a list of rules numbered as they appear in the text.

6. Obstruent Voicing:

$$[-\text{cont}] \longrightarrow [+\text{voice}] \;/\; \_\_ \begin{bmatrix} +\text{voc} \\ -\text{cons} \end{bmatrix}$$

8. Aspiration:

$$\begin{bmatrix} -\text{cont} \\ +\text{del rel} \end{bmatrix} \longrightarrow [+\text{aspirated}] \;/\; \_\_ \;\#$$

11. Spirantization:

$$\begin{bmatrix} -\text{cont} \\ +\text{back} \\ -\text{high} \end{bmatrix} \longrightarrow [+\text{cont}] \;/\; \begin{bmatrix} +\text{voc} \\ -\text{cons} \end{bmatrix} \_\_ \begin{bmatrix} +\text{voc} \\ -\text{cons} \end{bmatrix}$$

19. Rounding:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{back} \\ +\text{lo} \end{bmatrix} \longrightarrow [+\text{round}] \;/\; \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ +\text{round} \end{bmatrix}$$

20. Palatalization:

$$\begin{bmatrix} -\text{cont} \\ +\text{strid} \\ +\text{del rel.} \end{bmatrix} \longrightarrow [+\text{hi}] \;/\_\_ \begin{bmatrix} -\text{cons} \\ +\text{voc} \\ -\text{back} \end{bmatrix}$$

40. Velar Depalatalization:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{high} \\ -\text{back} \end{bmatrix} \longrightarrow [+\text{back}] \ / \ \_ \ \begin{bmatrix} +\text{cons} \\ -\text{voc} \end{bmatrix}$$

47. Resonant Devoicing:

$$\begin{bmatrix} +\text{sonorant} \\ +\text{glottal} \end{bmatrix} \longrightarrow [-\text{voice}] \ / \ \_\_ \ \#$$

66. 'h' Deletion:

$$\begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{cont} \\ +\text{lo} \end{bmatrix} \longrightarrow \emptyset \ / \ \begin{bmatrix} +\text{cons} \\ -\text{voc} \\ +\text{sonor} \\ +\text{ant} \end{bmatrix} \ \_\_$$

87. Stress Rule:

(i) Project the nucleus

(ii) Start from the right margin

(iii) Construct a left dominant unbounded foot (F) in which the dominant node must branch

(iv) Gather all syllables into a right-dominant word tree.

97. Uvular Deletion:

$$\begin{bmatrix} +\text{cons} \\ -\text{high} \\ -\text{low} \end{bmatrix} \longrightarrow \emptyset / \begin{array}{cc} \text{R} & \text{O} \\ \backslash & | \\ \_\_ & \text{X} \end{array}$$

116. Vowel Variation:

$$\begin{bmatrix}\text{+voc}\\\text{-cons}\\\text{+high}\\\text{-back}\end{bmatrix} \longrightarrow \begin{bmatrix}\text{+low}\\\text{+back}\end{bmatrix} \;/\; \begin{bmatrix}\text{+voc}\\\text{-cons}\\\text{-high}\\\text{-ant}\end{bmatrix}$$

$$\begin{bmatrix}\text{+voc}\\\text{-cons}\\\text{+high}\\\text{-back}\end{bmatrix} \longrightarrow \begin{bmatrix}\text{+round}\\\text{+back}\end{bmatrix} \;/\; \_\_[\text{+round}]$$

139. Uvular Spirantization II:

$$\begin{bmatrix}\text{-cont}\\\text{+back}\\\text{-high}\end{bmatrix} \longrightarrow [\text{+cont}] \;/\; \overset{\text{R}\;\;\;\text{O}}{\underline{\;\;}\backslash\,\text{X}/}$$

154. Glide to 'h':

$$\begin{bmatrix}\text{-cons}\\\text{-voc}\\\text{+hi}\\\beta\text{back}\end{bmatrix} \longrightarrow \begin{bmatrix}\text{+cons}\\\text{+lo}\\\text{-back}\\\text{-rd}\end{bmatrix} \;/\; \_\_ \begin{bmatrix}\text{-cons}\\\text{+voc}\\\text{+hi}\\\beta\text{back}\end{bmatrix}$$