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internal reduplication

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TRIPLE TAKE: TIGRE AND THE CASE OF INTERNAL REDUPLICATION*

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Ethiopian Semitic languages all have some form of internal reduplication. The characteristics of Tigre reduplication are described here, and are shown to diverge from the other languages in two main respects: i) the meaning and ii) the ability to incur multiple reduplication of the reduplicative syllable. The formation of internal reduplication is accomplished via infixation plus additional templatic shape requirements which override many properties of the regular verb stem. Further constraints on realization of the full reduplicative syllable outweigh restrictions on multiple repetition of consonants, particularly gutturals.

1 Introduction

Ethiopian Semitic languages have a form of internal reduplication, often termed the 'frequentative', which is formed by means of an infixed 'reduplicative syllable' consisting of reduplication of the penultimate root consonant and a vowel, usually [a]: ex. Tigrinya *səb**ə**bərə* 'break in pieces' corresponding to the verb *səbərə* 'break'.¹ Leslau (1939) describes the semantic value of the frequentative as reiterative, intensive, augmentative or attenuative, to which one could add distributive and diminutive. This paper focuses on several aspects of internal reduplication in Tigre, the northernmost Ethio-Semitic language. I present new data demonstrating that not only does Tigre allow internal reduplication with a wide variety of verbs, but it differs notably from other Ethiopian Semitic languages in two important respects:

- (1) a. the meaning of the internal reduplication is normally 'diminutive' or represents elapsed time between action; in the other languages it is usually intensive.
- b. the reduplicative syllable may be repeated up to three times, producing verbs such as *səb**ə**:b**ə**:b**ə**:bərə-a*, exclusively ruled out in the other languages.

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Many thanks to Mussie Bakit, my Tigre consultant, for first drawing my attention to the double and triple reduplications in Tigre. Mussie was also one of the consultants for Raz' 1983 grammar. Thanks also to my other consultants: Hiwet Asmelash, Beraki Woldeabzghi and Alem Woldemariam (Tigrinya), Farida Towfik (Harari), and Tadesse Sefer and Wolde Fujie (Chaha). This project was sponsored by a grant from the UCSD Academic Senate.

¹ All verbs are given in the 3rd person masculine singular perfective unless otherwise specified. In Tigrinya, the past tense is usually rendered by the gerundive form: *səbiru* and not the perfective *səbərə*. I use the perfective here to facilitate comparison with other languages.

I argue that the internal reduplication is not formed via simple infixation to the corresponding regular verb (cf. Buckley 1990 for Tigrinya); nor is there a ‘frequentative’ template (cf. Angoujard 1988). Instead, simple infixation is subject to super-imposed requirements from other elements, namely the root and the templatic shape of quadriconsonantal verbs, which obscure the direct relationship between the regular verb stem and the frequentative. The paper is organized as follows. In §2 I discuss the nature of frequentative formation in Tigre and compare it to the intensive form. I also contrast it with the use of the frequentative in other Ethiopian Semitic languages. In §3 I present arguments that the frequentative in Ethiopian Semitic languages is formed via *enriched infixation*, infixation with additional realization requirements. Finally, in §4 I discuss how the Tigre frequentative escapes restrictions that are otherwise placed on reduplication.

2 Frequentative and the Intensive

Tigre has several features which set it apart from the other Ethiopian Semitic languages, including an intensive form of the verb which takes the shape of the ‘Type C’ verbs in other languages. This shape is characterized by a long vowel [a:] appearing between the first two consonants of a trilateral verb, and no gemination of the second consonant (Raz 1983).² The intensive form (or distributive) is derived from Type A and Type B verbs. Types A, B and C refer to the lexical conjugation patterns of different roots (see Cohen 1936). Type A verbs have no gemination of the penultimate consonant in the perfective but gemination in the imperfective. Type B verbs are characterized by gemination of the penultimate consonant throughout the paradigm:

(2)	Type A	Intensive (Type C)
a.	kətb-a: ‘write’	ka:təb-a: ‘write repetitively’
b.	gərf-a: ‘whip’	ga:rəf-a: ‘whip many people’
c.	dəgm-a: ‘tell, relate’	da:gəm-a: ‘tell many stories’
d.	səbr-a: ‘break’	sa:bər-a: ‘break many things, repetitively’
	Type B	
e.	məssəl-a: ‘illustrate, give examples’	ma:səl-a: ‘give many examples’
f.	təlləm-a: ‘start; plough furrows’	ta:ləm-a: ‘start again and again; plough many furrows’
g.	bəddəl-a: ‘change clothes’	ba:dəl-a: ‘change clothes many times’

² The Type A perfective stem has the shape CəCC- with vowel-initial suffixes, but CəCəC- with consonant-initial (*gəfr-a:* ‘he whipped’ vs. *gəfər-ko* ‘I whipped’). I use a slightly different transcription system from Raz (1983). His high central vowel is transcribed as [ə], whereas I transcribe it as [ɨ]. Tigre has a distinction between two short low vowels /ə/ (Raz’s /a/) and long /a:/. The former may be lowered to [a] under certain conditions. For example, the vowel of the 3ms subject marker in Tigre is [a:]. This vowel triggers the lowering of all preceding /ə/ to short [a], up to an intervening peripheral vowel. See Palmer (1956), Raz (1983), Lowenstamm & Prunet (1985), Rose (1996). I do not indicate this lowering in this paper. The length difference in Tigrinya is controversial (see Buckley 1997 for discussion), but not so for Tigre, where there are distinct minimal pairs. However, the distinction between [ə] and [a:] is neutralized in word-final position.

Raz (1983) states that there are a few verbs with no obvious correspondence between Type A and Type C: *ʃa:kəra:* 'to praise' versus *ʃəkra:* 'to get drunk'. I have identified a few triplets, a homophonous root which has three different meanings corresponding to Types A, B and C. Since the Type C verb is already in the intensive form, it cannot adopt an intensive with a different meaning (3c), but note that the Ca:CəC- verb shape (*ma:səl-a:*) has three meanings, two of them intensives formed from Type A and B and one the regular Type C verb:

(3)	Type Regular		Intensive
a.	A.	məsl-a: 'resemble'	ma:səl-a: 'resemble many people'
b.	B.	məssəl-a: 'give examples, illustrate'	ma:səl-a: 'give many examples'
c.	C.	ma:səl-a: 'be diplomatic'	--- ---

There are sometimes semantic correspondences between Type A and Type B. One might draw a parallel between Type A 'resemble' and Type B 'illustrate' for the root /msl/; a more clear-cut example is that of *fət'ra:* 'create' *fətt'ər-a:* 'be created', but since the form *ti-fətt'ər-a:* is also possible with the meaning 'be created', this suggests that the passive prefix /ti-/ has been dropped.

In the other Ethiopian Semitic languages, the frequentative is used more commonly to express intensive or repetitive action, as shown by the following Harari forms.³ Speakers often give the qualifier 'a lot' or 'again' when describing the meaning of these verbs:

(4)	Regular		Frequentative
a.	kətəf-a	'chop'	kitatəf-a 'chop a lot'
b.	k'əbəl-a	'decrease'	k'ibabəl-a 'decrease greatly'
c.	wək'ət'-a	'wrestle, fight'	wik'ak'ət'-a 'wrestle, fight a lot'
d.	lak'ət'-a	'mix'	lik'ak'ət'-a 'mix a lot'
e.	magəd-a	'burn surface, annoy, pain'	migagəd-a 'burn a lot'

However, despite this tendency, there is still a range of meanings that the frequentative may adopt, often dependent on the meaning of the base verb. Leslau (1995) provides the following range of meanings for Amharic frequentatives:

(5) Amharic	Regular		Frequentative
intensive	səbbər-	'break'	səbabbər- 'shatter in pieces'
repetition and frequency	ləmməd-	'get used to'	ləmamməd- 'rehearse'
infrequency	mətt'a-	'come'	mət'att'a- 'come off and on'
multiplicity of action	ləwwət'-	'change'	ləwawwət'- 'change constantly'
multiplicity of objects	kəffəl-	'divide'	kəfaffəl- 'cut in pieces'
completed action	k'wərrət'-	'cut'	k'wərrət'- 'cut up'
action performed in a hurry	ləmmən-	'beg'	ləmammən- 'beg quickly'
attenuated action	ləkk'əm-	'gather'	lək'akk'əm- 'peck up, gather up'

³ The vowels are transcribed as in the other languages, although [ə] is more accurately short [a] and [a] long [a:].

In Tigre, however, the frequentative consistently expresses diminutive action:

(6) Regular	Frequentative
a. gərɸ-a: ‘whip’	gərarəɸ-a: ‘whip a little’
b. kətɸ-a: ‘write’	kətətəɸ-a: ‘write a little’
c. nəʃh-a: ‘advise’	nəsasəh-a: ‘advise a little’
d. məzz-a: ‘give responsibility’	məzazəz-a: ‘give a little responsibility’
e. saʃan-a: ‘load’	saʃaʃan-a: ‘load a little’ ⁴

Contrasts between Tigre and Tigrinya clearly show this pattern. For example, *səba:bəra:* in Tigre conveys ‘break one object after another’, but in Tigrinya the corresponding frequentative signals ‘break in pieces’. I will continue to use the label ‘frequentative’ for this verb form to facilitate comparison with the other languages, despite the fact that its semantics are different. As noted above, however, ‘frequentative’ is a cover term for a range of meanings in the other languages.

In Tigre, the contrast between the intensive and frequentative is evident in the following forms:

(7) a. səff-a: ‘clean wounds’	sa:fəf-a: ‘clean wounds of several people’	səfa:fəf-a: ‘clean a few wounds’
b. dəgm-a: ‘tell a story’	da:gəm-a: ‘tell many stories, repeat stories’	dəga:gəm-a: ‘tell stories occasionally’
c. wəlləb-a: ‘glance around’	wa:ləb-a: ‘look back and forth a lot’	wəla:ləb-a: ‘glance around once in a while’

Raz states that the intensive may be formed from quadriradical verbs. My data confirm this, and the meanings range from multiple objects to repetition of action:

(8) Regular (Quad.)	Intensive
a. mərmər-a: ‘examine’	məra:mər-a: ‘examine thoroughly’
b. gəsgəs-a: ‘march forward’	gəsagəs-a: ‘charge forward repeatedly’
c. fəntər-a: ‘scatter (seeds)’	fənatər-a: ‘scatter many seeds’
d. bərgəd-a: ‘jump, flee’	bəragəd-a: ‘jump from one foot to another’
e. k’ənt’əb-a: ‘pick; be brave’	k’ənət’əb-a: ‘pick many things’
f. dəngəs’-a: ‘be scared’	dəna:gəs’-a: ‘be very scared’
g. wədʒwədʒ-a: ‘praise, flatter’	wədʒa:wədʒ-a: ‘praise a lot’

⁴ The vowel [ə] lowers to [a] adjacent to gutturals.

Moreover, there are contrasts between the intensive quadrilateral and the frequentative quadrilateral:

(9)	Regular	dəngəs'-a:	'become scared'
	Intensive	dəna:gəs'-a:	'become very scared'
	Frequentative	dənəga:gəs'-a:	'become slightly scared'

The intensive has two shapes, Ca:CəC- for trilaterals and CəCa:CəC for quadrilaterals. Like the frequentative, the [a:] is positioned before the penultimate consonant. The only structural difference from the frequentative is that there is no accompanying reduplication in the intensive.

The other aspect of Tigre frequentative reduplication which sets it apart from the other languages is that it is found with a wider array of verbs. In Tigrinya and Chaha, a South Ethio-Semitic Gurage language, it is difficult to form the frequentative from stative verbs. But in Tigre, I have found very few verbs which do not also have a frequentative form. Even the verb 'to die' has a frequentative form, with the meaning 'pretend to die'. Besides semantic criteria, the phonological make-up of the roots plays no restrictive role. The frequentative is formed from biliteral roots (10a), roots which have a glide, or so called 'weak roots' (10b-d), quadrilateral roots (10e) and verbs which already have repetition of root consonants (10f-i):

(10) a.	ləff-a:	'pass by'	ləfa:fəf-a:	'pass back and forth'
b.	mətt'e	'betray'	mət'a:t'e	'betray a few people' ⁵
c.	los-a:	'mix'	ləwa:wəs-a:	'mix a little'
d.	mot-a:	'die'	məja:jət-a:	'pretend to die, be pathetic'
e.	k'ənt'əb-a:	'pick'	k'ənət'a:t'əb-a:	'pick a little'
f.	ʃaʃaləl-a:	'shudder'	ʃaʃala:ləl-a:	'shudder a bit'
g.	s'ənɸaf-a:	'sip'	s'ənəfa:fəf-a:	'sip a bit'
h.	nəkək-a:	'shake in hysterics'	nəkənə:nək-a:	'shake a little'
i.	mək'mək'-a:	'extract, pull out'	mək'əma:mək'-a:	'pull out a bit'

It may also occur with all lexical verb Types A, B and C, as will be discussed further in section 3.1. Raz (1983) states only that the frequentative is formed from Type A verbs, but it is not so restricted. In comparison to the other Ethiopian Semitic languages, Tigre frequentative reduplication is highly productive.

2.2 Triple Attenuation

The most striking aspect of Tigre internal reduplication is the ability to form verbs with up to three reduplicative syllables. With each reduplication, the meaning is attenuated

⁵ This is a Type B verb with a final glide [j], which does not appear in the 3ms form. In forms with consonant-initial suffixes, such as the 1s form, it appears as [e]: *mətt'e-ko*, Frequentative: *mət'a:t'e-ko*, Intensive: *ma:t'e-ko*

- (11) dəgm-a: 'tell, relate'
 dəgɑ:gəm-a: 'tell stories occasionally'
 dəqɑ:qɑ:gəm-a: 'tell stories very occasionally'
 dəqɑ:qɑ:qɑ:gəm-a: 'tell stories infrequently'

This type of repetition is excluded in all the other Ethio-Semitic languages. While double reduplications do occur across languages, they tend to involve two separate reduplicative morphemes (Urbanczyk 1996), rather than repetitions of the same one. This is true of Ethiopian Semitic languages, which usually allow double reduplications only if the two reduplications have different functions (Rose 2000a). For example, many Ethio-Semitic verbs are built from roots which reduplicate to fill out templatic shapes by either repeating the final consonant (12a) or copying the final two consonants (12b) as shown for Tigrinya:

- (12) **Tigrinya**
- | | | |
|-----|-----------------------|--|
| a) | <i>Final Doubling</i> | <i>Repeat the final consonant</i> |
| i. | gf --> | gəfəf-ə 'collect' |
| ii. | dnz --> | dənzəz-ə 'be numb' |
| b) | <i>Total Copy</i> | <i>Repeat the final two consonants</i> |
| i. | bs --> | bəsbəs-ə 'mix' |
| ii. | slm --> | sələmləm belə 'nod off' |

In Tigre, Tigrinya, Harari, and Amharic the frequentative can be formed from biliteral roots which already contain a repetition of the second consonant as in (12ai), thus adding a second kind of reduplication and three instances of the second root consonant in the output:

- (13) a. **Tigre**
- | | | | | | |
|-----|-----------|-----------|------|-------------|------------------------|
| i. | mədd-a: | 'stretch' | iii. | mədə:dəd-a: | 'stretch a little' |
| ii. | zənnən-a: | 'suspect' | iv. | zənənən-a: | 'suspect a little bit' |
- b. **Tigrinya**
- | | | | | | |
|-----|------------|---------------|------|--------------|---------------------|
| i. | k'ədəd-ə | 'tear' | iii. | k'ədədəd-ə | 'tear again' |
| ii. | wətt'ət'-ə | 'pull, force' | iv. | wət'at'ət'-ə | 'force many people' |
- c. **Harari**
- | | | | | | |
|-----|----------|--------|------|------------|---------------------|
| i. | zələl-a | 'jump' | iii. | zələləl-a | 'jump a lot' |
| ii. | k'ədəd-a | 'tear' | iv. | k'ədədəd-a | 'tear a lot, again' |
- d. **Amharic**
- | | | | | | |
|-----|------------|-----------------|------|---------------|------------------------------|
| i. | səkk'ək'-ə | 'shock, appall' | iii. | sək'akk'ək'-ə | 'shock, appall a great deal' |
| ii. | məzzəz-ə | 'pull out' | iv. | məzəzzəz-ə | 'draw out a lot, little' |

This is not possible in Gurage languages such as Muher or Chaha. They cannot form frequentatives from these kinds of verbs. In Rose (1997, 2000a) and Buckley (1999) avoidance of double repetition of this type is attributed to a constraint INTEGRITY (McCarthy &

Prince 1995), which prevents a single input segment from corresponding to more than one output segment (see also Suzuki 1996 on Bijectivity). In Rose (2000b), this constraint is subsumed as part of a general OCP restriction holding over the Semitic verb stem. The INTEGRITY constraint is so important in Western Gurage that few violations of it are found, and the frequentative is almost never formed from these verbs.

The frequentative can also be formed from the quadriconsonantal total copy and final doubling forms as in 12a(ii) and 12b), in Tigrinya, Tigre, and Harari. The quadriliteral may be augmented in two ways in Tigrinya: by the vowel [a] only, producing the standard frequentative shape but with no reduplication, or by the whole reduplicative syllable, forming a verb with five consonants (14f). Speakers vary on which shape they prefer. My Tigrinya consultants, although all from Asmara and all roughly the same age, differ on this point. But, even for speakers who prefer the longer template, this template cannot be used if the quadriconsonantal verb form already has reduplication (14g-j) (Leslau 1939; Rose 2000a):

- | | | | | | |
|---------|-----------|-------------------|----|----------------|--------------------------------|
| (14) a. | gəlbət'- | 'turn over (tr.)' | f. | gəlabət'- | 'turn over and over' |
| | | | | gələbabət'- | " " |
| b. | bəs'bəs'- | 'mix' | g. | bəs'abəs'- | 'mix many things/continuously' |
| | | | | *bəs'əbabəs'- | |
| c. | t'əbt'əb- | 'pat' | h. | t'əbat'əb- | 'pat continuously' |
| | | | | *t'əbət'at'əb- | |
| d. | ʃərməm- | 'chip' | i. | ʃəraməm- | 'chip many times' |
| | | | | *ʃəraməm- | |
| e. | k'ərdəd- | 'dice' | j. | k'əradəd- | 'dice a lot' |
| | | | | *k'əradəd- | |

In Tigre, however, the difference between the two forms represents the difference between the intensive and the frequentative; in Tigrinya, the meaning is the same, but reflects a speaker's preference for one form over the other.

(15) **Tigre**

- | | | | | |
|----|----------|-----------------|--------------|--------------------------|
| a. | dəngəs'- | 'become scared' | dəna:gəs'- | 'become very scared' |
| | | | dənəga:gəs'- | 'become slightly scared' |
| b. | dənzəz- | 'be numb' | dəna:zəz- | 'be very numb' |
| | | | dənəza:zəz- | 'be a little numb' |

In Harari, the frequentative is also formed from quadriconsonantal forms which already contain reduplication, as in Tigre:

(16) **Harari**

- | | | | | | |
|----|-----------|-------------|----|-------------|-------------------|
| a. | k'ərdəd-a | 'cut, chop' | c. | k'əradəd-a | 'cut, chop a lot' |
| b. | məramər-a | 'examine' | d. | mərəmamər-a | 'examine a lot' |

I have only found a few examples of this type in Amharic, and none formed from the total copy forms. The relative importance of Integrity in Harari and Tigre appears to be quite low, as seen by the ease with which forms with triple instances of a single consonant occur. In addition, in

Tigre, since each repetition of the reduplicative syllable contributes independently to the attenuation of the basic meaning, the extension of the meaning is more important than obeying Integrity.

The INTEGRITY constraint can also be held responsible for the observation noted in Prunet & Petros (1996) for Chaha that a form with double repetition whose sole purpose is to fill out the template is excluded. This point is illustrated for Tigre with the root /mkʼ/ mapped onto a quadriconsonantal template to produce *makkʼəkʼa: by analogy with gəlbətʼa:

(17)	m	kʼ	kʼ	kʼ
	C	ə	C	C

Prunet & Petros note that there is an alternate means of filling the template without double repetition, by copying the entire root. In Tigre, this would be məkʼməkʼa:. This shows that even in Tigre, INTEGRITY plays a role and will not be overridden without good reason. In the following section, I address the problem of how exactly the frequentative is formed.

3 Formation of the frequentative

Two analyses have often been presented in the literature for the formation of the frequentative: the *infixation hypothesis* and the *template hypothesis*. In this section I argue that neither is adequate to capture all the complexities of frequentative formation. Instead, I propose that the frequentative is formed via infixation, but supplemented by a host of additional requirements. I term this the *enriched infixation hypothesis* (see also Rose 2003).

3.1 Infixation hypothesis

The repetition of the reduplicative syllable in Tigre suggests that the frequentative is formed by infixation of the reduplicative syllable [Ca:] into the regular verb, the *infixation hypothesis*. This is the position adopted by Buckley (1990) for Tigrinya and by Petros (1993, 1997) for Chaha. While it appears on the surface to be the most natural approach in an item-and-arrangement approach to morphology, it faces several problems, not just for Tigrinya and Tigre, but for all Ethiopian Semitic languages. First, no matter what the shape of the original verb is, the basic frequentative always takes the same shape CəCa:CəC; gemination and the vowel pattern of the original verb are not maintained in the frequentative, as illustrated for Tigre in (18).⁶

(18)	Regular	Frequentative	
a. Type A	dəgm-a:	dəga:gəm-a:	‘tell’
b. Type B	wəlləb-a:	wəla:ləb-a:	‘look both ways’
c. Type C	bə:rək-a:	bəra:rək-a:	‘bless’

The consonant cluster seen in the 3ms form of Type A verbs is not maintained in the 3ms frequentative. The gemination of Type B is also not maintained, nor is the [a:] vowel of Type C. The vowel of the frequentative is a long [a:] and cannot occur in a closed syllable; this could account for why Type A and B take the form they do, but it does not explain Type C:

⁶ The Type C vowel [a] or gemination in Type B may be carried over to the frequentative in Amharic or Tigrinya. See Leslau (1941) on Tigrinya, Leslau (1995) on Amharic.

- (19) dəgm-a: + [Ca] --> *dəga:gm-a:
 wəlləb-a: + [Ca] --> *wəla:lləb-a:
 ba:rək-a: + [Ca] --> *ba:ra:rək-a:

The problem is better illustrated for Type A by the jussive form. The jussive takes the shape *li-dgəm*, but the frequentative is *li-dəga:gəm*, whereas insertion of the reduplicative syllable /li-dgəm + Ca:/ predicts **li-dga:gəm*, with no vowel between C1 and C2.

Other Ethio-Semitic languages illustrate the same basic problem, as the following Amharic jussive forms demonstrate. If the frequentative were formed by infixing a syllable to the jussive form, we would predict the incorrect forms in (20) for the jussive (in Amharic the frequentative vowel [a] may occur in closed syllables). Note that although the Type B verb *ji-fəlallig* with gemination is possible for some speakers, simple insertion cannot generate the other possible form *without* gemination:

(20)		Regular	Actual	Predicted
		Frequentative	Frequentative	
Type A	ji-sbər	ji-səbabir	*ji-sbabər	‘break’
Type B	ji-fəllig	ji-fəlallig	?ji-fəlallig	‘want’
Type C	ji-mark	ji-mərarik	?ji-mararik	‘surrender’

The second argument against infixation comes from the quadrilateral. As discussed in §2, the quadrilateral forms the frequentative with reduplication and [a:], producing a verb with five consonants. If the reduplicative syllable were simply infixated into the regular verb, we would expect the derivation /dəngəsa: + Ca:/ --> **dənga:gəsa:*, but the actual five-consonant form has an extra vowel [ə] intervening between the second consonant and the reduplicated consonant: *dənəga:gəsa:*. In conclusion, simple infixation of a reduplicative syllable into the regular verb cannot accurately capture all the properties of the frequentative.

3.2 Template hypothesis

If simple infixation to the regular verb stem does not produce the correct output forms, could the frequentative be characterized by its own template to which the root is mapped? I dub this the *template hypothesis*. Raz (1983) treats the frequentative as a separate verb type, Type D, with its own particular template. Angoujard (1988) proposes a template with the penultimate consonant position marked as a ‘copy’ position or an infix in Amharic. The root maps to the template and then the preceding consonant is copied to the copy position. Rose (1992) also proposes a separate frequentative template to which the root is mapped for Chaha. The *template hypothesis* avoids the problems of the infixation hypothesis, and accounts for why the frequentative template is identical for all verb Types. However, by relying on a separate template, this analysis misses the generalization that the position and quality of the vowels is remarkably similar to those of regular quadrilaterals:

(21)	Tigre	Quadrilateral	Frequentative
	Perfective	məskər-a:	dəga:gəm-a:
	Imperfective/jussive	li-məskir	li-dəga:gim

The difference between the quadriliteral and the frequentative templates is the presence of the frequentative [a:] vowel. This pattern is even more striking in Amharic. There is gemination in both perfective and imperfective of both the regular quadriliteral and the frequentative, but not in the jussive. The perfective forms have a vowel [ə] between the two final consonants, whereas the imperfective and the jussive do not. Again, apart from the presence of the vowel [a] between C2 and C3 in the frequentative and the vowel [ə] or no vowel in the quadriliteral, the forms are identical.

(22)	Amharic	Quadriliteral	Frequentative
	Perfective	məsəkkər-	səbabbər-
	Imperfective	-məsəkkir-	-səbabbir-
	Jussive	-məskir-	-səbabir-

If the frequentatives had completely separate templates, their similarities with quadrilaterals would be entirely accidental.

A second problem with the separate template analysis is that two different frequentative templates would be necessary to accommodate those frequentatives formed from triconsonantal forms and those derived from quadriconsonantal forms:

(23)	Triconsonantal:	CəCja:CjəC-
	Quadriconsonantal:	CəCəCja:CjəC-

Finally, it would be difficult to account for the repetition of the reduplicative syllable in Tigre (i.e. *dəga:ga:ga:gəm-a:* from (11)) if the frequentative were built strictly on a template. The Tigre data provide striking evidence that the reduplicative syllable is a salient *isolable* part of frequentative formation.

3.3 Enriched infixation hypothesis

Neither hypothesis is capable of capturing the range of frequentative properties. On the one hand, the frequentative should match the vowel quality and gemination patterns of quadrilaterals, since a frequentative form also has at least four consonants. On the other hand, it must differ from a regular quadriliteral in the position of the reduplicated consonant and the accompanying [a:] vowel, which form a consistent ‘reduplicative syllable’. The ‘reduplicative syllable’ is particularly salient in Tigre as it may be repeated several times. In order to capture all these properties, I propose that the frequentative is formed via infixation of a reduplicative syllable to the regular verb stem, but that the actual surface form is governed by several additional requirements. These requirements obscure the overt relationship between the regular verb and the frequentative:

- (24) i. Template match
 An output form with four (five) consonants must conform to a quadri- (quinqi-)-consonantal template, matching the position and nature of the aspectual vowels
- ii. Root Realization
 All root segments must be represented in the output

iii Frequentative Realization

Reduplication and the affix [a:] must be realized in the frequentative preceding the final syllable of the stem (= preceding the penultimate output root consonant).

One might counter that given these requirements, reference to the regular verb form is unnecessary. However, two pieces of evidence argue in favor of reference to the regular verb. The first piece of evidence is that total copy verbs such as *nəknək* have only two root consonants /nk/, yet the frequentative is *nəkənə:nək-*. If reference were only made to the root, we might expect the frequentative to be *nəkəkək-*, which also matches the frequentative shape. The second piece of evidence comes from languages other than Tigre, in which the frequentative optionally incorporates gemination or the vowel quality that is characteristic of the basic stem. For example, the frequentative of Type C verbs in Amharic may, for some speakers, have the vowel [a] in the second position: *marəkə* ‘capture’ corresponds to *mararrəkə* or, albeit less commonly, *mərrərəkə* (Leslau 1995:456). These results demonstrate the frequentative’s allegiance to the independent regular verb. In this manner, it is similar to other cases of derived stems in Semitic languages, such as broken plurals (McCarthy & Prince 1990, Ratcliffe 1998), denominative verb formation in Modern Hebrew (Bat-El 1994, Ussishkin 1999) or Arabic hypocoristics (Zawaydeh & Davis 1999). I now consider each of the requirements and show how they conspire to produce the frequentative verb form.

3.3.1 **Template Match**

The first requirement involves a match between the number of consonants in the output and the shape of the template. If an output form has four consonants, no matter what the source of the consonants is (i.e. root consonants or their reduplicants), the output must conform to a quadriconsonantal shape, both in the position and quality of vowels, and in consonant gemination. The shape is CəCCəC in the perfective and CəCCiC in the imperfective/jussive. Although ‘template match’ bears some similarity to constraints requiring correspondence between two output forms (i.e. the frequentative and the regular quadriconsonantal stem), one cannot require that every frequentative form match the quadriconsonantal stem. Instead, the shape is determined by the total *number* of consonants of the basic stem plus the reduplicative copy of the frequentative. This templatic requirement overrides the templatic shape of the regular triconsonantal verb stem.⁷ Template match holds for any verbs with four output consonants, including total copy, final doubling and the frequentative. The only difference between the other kinds and the frequentative is the infix [a:] between the second and third consonants in the frequentative (25d):

(25)	Root	Perfective	Imperfective/Jussive	
a. Quadriliteral	mskr	məskər-	-məskir	‘testify, witness’
b. Final doubling	s’nf	s’ənfəf-	-s’ənfif	‘sip’
c. Total copy	nk	nəknək-	-nəknik	‘shake in hysterics’
d. Frequentative	grf	gərarəf-	-gərarif	‘whip a little’

⁷ It is conceivable that the templatic shapes could be derived via alignment constraints (see Buckley 1997 on Tigrinya, Ussishkin 1999 on Modern Hebrew). I do not attempt to provide such an analysis here, but note that the shapes are specific not only to the number of consonants, but also the lexical requirements of the verb. Type B verbs use the same basic templates, but the middle two consonant slots form a geminate: *wəlləb-* (perf.) vs. *-wəllib-* (imperf./juss.). Note that Type A verbs distinguish the imperfective and jussive: *-CəCCiC-* vs. *-CCəC-*.

This suggests that template selection is a function of reduplication and not that reduplication is a byproduct of template selection, as argued by Prunet & Petros (1996) for the Gurage dialect Chaha. They argue that if a root selects a ‘long template’, a quadriconsonantal template, then reduplication automatically follows. While this approach is appealing for the final doubling and total copy cases, it does not naturally extend to the frequentative, which, as I have argued above, cannot be explanatorily derived through template selection. Instead, I am suggesting that the frequentative makes use of pre-existing templates used for other verb forms.⁸ The same template match requirement holds for quinquiconsonantal forms, as we shall see shortly. If there are five consonants in the output, the template must be of a particular shape.

3.3.2 Root realization

The consonant which is copied in frequentative reduplication is the penultimate consonant of the regular verb. In most cases this consonant is also the penultimate root consonant. However, if the regular verb itself contains reduplication, in some cases the penultimate is the reduplicative surface correspondent of the root consonant. This occurs with total copy verbs, such as *nəkənək* from the root /nk/, whose frequentative is *nəkənə:nək*. In other cases, the consonant copied is not the penultimate surface consonant, but the penultimate root consonant. This occurs with weak roots containing glides. Examples include hollow verbs like *dor-* (root *dwr*) which reduplicate to *dəwə:wər-* or glide-final verbs such as *mətt'e-* (root *mtʔj*) in which the mid vowel [e] indicates the presence of the root glide /j/. As the only cases of the peripheral vowels [u o i e] in the verb stems derive from root glides, it is clear that a round vowel corresponds to a labial root glide [w] and a front vowel corresponds to a palatal root glide [j].⁹

The second constraint ensures that all root consonants are present in the frequentative (although final glides may appear fused into front or round vowels). For example, the templatic match requirement and root realization requirement combine to ensure that a non-surfacing glide in a regular hollow verb will be realized in the frequentative. Consider the following forms from the root /dwr/ ‘to go around’:

(26)		Perfective	Imperfective	Jussive
	2ms	dir-ka	ti-dəwɪr	ti-dur
	3ms	dor-a:	li-dəwɪr	li-dur
	3mp	dor-əw	li-dəwɪr-o	li-dr-o

⁸ I do not explore this idea further in this paper, but there seems to be a correlation between the ability to create longer reduplicative verbs and the independent existence of suitable templates in Ethiopian Semitic. See Unseth (1998) for similar observations.

⁹ Two verbs of this shape, *səlom-a:* ‘fast’ and *mot-a:* ‘to die’ reduplicate with a [j] glide instead of the expected [w] glide: *səjajəm-a:* ‘fast intermittently’ not **səwə:wəm-a:*. I attribute this to the presence of a labial consonant in the root, in both cases [m]. While glides usually form a class apart from other consonants in root structure constraints (Greenberg 1950, McCarthy 1994), Ussishkin (1999) has found similar restrictions on the combination of coronals and the palatal glide [j] in Modern Hebrew in the derivation of denominal verbs. It would appear that the OCP on [labial] is overtaxed by having three labial consonants in the frequentative stem, and the [j] consonant is substituted instead of [w]. However, alternations between [w] and [j] are also found in Tigrinya with no apparent trigger (Berhane 1991): *ʃənəwə* or *ʃənəjə* ‘it is ruined’ and in Ammani Arabic (Zaweydeh & Davis 1999): ex. *ʃawad-a* ‘return’ corresponds to the name *ʃajda*.

The root glide /w/ in the verb *dor-* shows up as [u], [w], as part of [o], or not at all. The frequentative form is *dəwawəwə-*. If the base is *dor-* or even *dir-*, the root realization requirement will ensure that the [w] appear in the frequentative.

One could argue that the frequentative is derived from an intermediate stage in the formation of the regular stem at the point when root consonants are combined with vowels prior to any morphophonemic changes. For *dor-*, this would be a form such as *dəwəwə-*. The frequentative and its corresponding regular verb would be related only in the sense that both have the same initial stages in their derivation, i.e. root /dwr/ and pattern /CəCəC/ → *dəwəwə-*. However, the frequentative and the regular verb would then be derived independently of each other from the intermediary stage. The problem with this approach is that there is no sense in which one form is more 'basic' than the other, and yet it is clear that the frequentative builds morphologically and semantically on the regular base form. Furthermore, there are enough clear indications of [w] as the root glide within the verbal paradigm to relate the frequentative directly to the surface form of the regular verb.

3.3.3 Frequentative realization

The third constraint identifies the 'reduplicative syllable' as being integral to the formation of the frequentative. If any component can be identified as the 'frequentative morpheme', it is the syllable composed of *a:* and the reduplicative requirement or morpheme. This is modeled as an abstract morpheme RED in the framework of McCarthy & Prince (1995). Reduplication is integral to the frequentative in Tigre; infixation of only *a:* will result in an intensive form, which is distinguished from the frequentative solely by reduplication. The syllable is prefixed (infix) to the final syllable of the stem. This accounts for the consistent position before the penultimate consonant: ex. *səbər-* --> *səCa:bər-* or *dəngəs'-* --> *dənəCa:gəs'-*. See Broselow & McCarthy (1984), McCarthy & Prince (1986), Spaelti (1997) for similar cases of affixation to prosodic constituents. While reduplication in Semitic is generally rightward in that the copy appears to the right of the base (see the examples of final doubling in (12)), in the frequentative it appears to be leftward. If it were rightward, we would have to assume that the 'reduplicative syllable' were not a syllable, but a V:C sequence (*səba:bər-*) infixes before the final vowel of the stem. Although many reduplicative infixes are vowel-initial (Broselow & McCarthy 1994), those infixes prefixed to final prosodic constituents, such as the final foot or syllable, are often CV and copy the segments to their right. The frequentative matches this pattern. A second argument in favor of the 'reduplicative syllable' is that in Tigrinya, the gemination of the penultimate consonant of a Type B verb may be preserved in the frequentative for some speakers (see Leslau 1941): ex. *bəddəl-ə* → *bədadələ*. If the second consonant were the reduplicated consonant, there would be no direct correspondence between the geminated consonant in the base and the geminated consonant in the frequentative.

Reduplication in the frequentative only copies a single consonant. Some analysts have attempted to explain small-size reduplication via a templatic size constraint on the reduplicant itself (McCarthy & Prince 1986, 1995). This is problematic if the reduplicant is a single consonant, as such a template does not fit within the typology of prosodic constituents outlined in Prosodic Morphology (McCarthy & Prince 1986). Other researchers have eschewed the templatic approach in favor of overall alignment of all syllables in a word (Spaelti 1997, Walker 1998, Ussishkin 1999, 2000). The more syllables are added, the less well they are aligned with the edge of the word. The output with the best alignment is the one that copies the least material, resulting in minimal reduplication. I do not adopt such an approach here as it entails computational difficulties in assessment of violations (see Eisner 1997 for a critique). Spaelti

(1997) also notes that prefixation to a prosodic constituent within the base word reduces the amount of available base material to copy, which helps explain why reduplicative infixes are small in size. For Tigre, we still have to ask the question why the frequentative copies one consonant and not two. If the frequentative is formed via prefixation to the final syllable of the base, why is the output *gəra:rəf-* and not *gəra?arəf-* or *gərfarəf-*? Although reduplication of the final two consonants is possible, it does not convey the frequentative meaning: ex. *hawəfwəf-a:* 'disappear'. Another factor that comes into play in assessing why infixing reduplicants are small in size is how far apart the two halves of the base are when split by infixation in the output. In order to minimize the gap between the two halves, reduplication copies only what is minimally necessary to satisfy the RED morpheme, which requires only reduplication but does not specify how much. Splitting the base incurs a violation of the constraint CONTIGUITY in the OT framework (McCarthy & Prince 1995) which preserves strict precedence structure between two correspondent strings, in this case between the regular verb stem and the output frequentative stem. If this constraint is ranked above MAX_{B-R}, the constraint that requires maximal copy of the base, minimal reduplication results. A violation is assessed for each segment intervening between the two halves. MORPHOLOGICAL EXPRESSION is violated if the input RED fails to be realized in the output as in (27d). Reduplication must occur to express the frequentative. If CONTIGUITY is ranked over MAX_{B-R}, the form with minimal infixation and minimal reduplication is selected (27a).

(27)

gərəf RED+a:	MORPHOLOGICAL EXPRESSION	CONTIGUITY	MAX _R
☞ a. gəra:rəf		**	*
b. gərfa:rəf		***!	
c. gərəfa:rəf		***!*	
d. ga:rəf	*!	*	**

In conclusion, the frequentative is formed via prefixation to the final syllable of the base stem. Copying is rightward and minimal.

3.4 Some examples

A frequentative formed from a triconsonantal root easily meets all the requirements outlined above in (24): template match, root realization and frequentative realization. I set this up in an Optimality Theory-style tableau, although the constraints are not inherently ranked. The point is to show that the candidate in (28a) fares better on all three requirements than any other possible output form:

(28)

/gərəf RED+a:/	Template Match	Root Realization	Frequentative Realization
✓ a. gəra:rəf	✓	✓	✓
b. gəra:rrəf	*	✓	✓
c. gəra:rəf	✓	✓	*
d. gəra:f	*	*	✓

The output *gərarəf* matches the quadriconsonantal verb shape of CəCCəC, with the exception that it has the infix [a:], responding to frequentative realization. The root is represented by all three consonants, and the reduplicative requirement is satisfied.

As for a form like *dor-a:* ‘go around’ whose frequentative is *dəwarwər-a:* ‘go around a little’, it is clear from this example that there is faithfulness to the root segments. The primacy of the root is also apparent in a language like Chaha, in which devoicing of a penultimate consonant is not carried over to the reduplicated consonant in the frequentative (see also Rose 2003):

- (29) a. səpər-ə-m ‘break’ c. səβəpər-ə-m ‘shatter’
 b. dʒəkəm-ə-m ‘hit’ d. dʒəgəkəm-ə-m ‘hit again’

In fact, for Type B verbs such as *dʒəkəm-ə-m* ‘hit’, which have a devoiced penultimate consonant in the perfective, imperfective and jussive (see Banksira 1997, 2000), the frequentative provides the only clue as to the true nature of the underlying consonant. Compare this with the verb *ʃəkət-ə-m* ‘prepare’:

- (30) a. perfective dʒəkəm-ə-m ʃəkət-ə-m
 b. imperfective ji-dʒəkim ji-ʃəkɪt
 c. jussive jə-dəkɪm jə-səkɪt
 d. frequentative dʒigəkəm-ə-m ʃikakət-ə-m
 perfective

The frequentative reveals that *dʒəkəm-ə-m* has an underlying /g/, whereas *ʃəkət-ə-m* has an underlying /k/ (or /x/ in Banksira’s 1997, 2000 analysis)

Tigre allows for verbs with five consonants of the shape CəCəCCəC-ə: i.e. *hawəʃwəʃ-a:*. Most of these verbs involve final reduplication and are derived from triconsonantal roots. This is a pan-Semitic pattern, as documented in Unseth (1998, 2002). Nevertheless, their conjugation patterns are systematic and mirror the quadriconsonantal shape with the addition of an extra Cə syllable (Ca if the C is guttural) at the left edge of the word. Note that the prefix /li-/ appears as [la-] when adjacent to a guttural.

- (31) ‘disappear’ ‘grumble’ ‘to move, hurry (tr.)’
 perfective həwəʃwəʃ-a: gərəmrəm-a: ʔawədwəd-a:
 imperfective/ la-həwəʃwiʃ gərəmrɪm la-ʔawədwid
 jussive

This is the shape used by the quadrilaterals to form a frequentative, and accounts for the existence of the vowel [ə] between the second and third consonants. Again, all criteria are met:

(32)

/dəngəs' RED+a/	Template Match	Root Faithfulness	Frequentative Realization
a. dənəga:gəs'	✓	✓	✓
b. dənə:gəs'	✓	✓	*
c. dənə:nəgəs'	*	✓	*

If the root has four consonants, another option would be for only the vowel [a:] to appear with no reduplication, as in candidate (32b). However, in Tigre, such a form would be interpreted as the intensive rather than the frequentative, and so it would fail on the third requirement of frequentative realization. Such a shape is possible for some speakers of Tigrinya, which does not have the intensive form. Recall that the frequentative in Tigrinya often conveys the notion of intensity or multiple objects. Certain speakers of Tigrinya prefer *məsakər-a*, whereas others *məsəkəkər-a*. For those who prefer the quinquiconsonantal template, more emphasis is placed on reduplication (Rose 2000a). For those who select the quadriconsonantal template, reduplication is suppressed in favor of the shorter frequentative template. There is no room for reduplication within the shorter template without deleting one of the root consonants. This is essentially a trade-off between reduplication and conforming to a quadriconsonantal frequentative shape. In each case, however, the notion of 'frequentative' is expressed in Tigrinya, as there is no possible homophony with an intensive form.

Further reduplication within the frequentative simply repeats the [a:] infix and reduplication, which together form a CV: syllable. This aspect of Tigre frequentatives emphasizes the notion of the reduplicative syllable as representing frequentative. The maximal threshold for repetition appears to be restricted to three at the most.

(33) a.	dor-a:	dəwa:wa:wa:wər-a:	'go around once in a while'
b.	dəgm-a:	dəga:ga:ga:gəm-a:	'tell stories infrequently'
c.	kənfər-a:	kənəfa:fa:fər-a:	'insult occasionally'
d.	dənzəz-a:	dənəza:za:zəz-a:	'feel slightly numb'

While the number of repetitions could be related to the maximal size of the template, i.e. a form with six consonants, I suspect that the threshold has more to do with parsing capacity. There are a few verb forms with six consonants; some of these are conjugated with the auxiliary verb *bela:* 'to say'. All have the peculiarity of the consonant [n] in the second position, suggesting some kind of augmentation. Their shape does not match that of the frequentative with six consonants, suggesting that they do not form a model for the frequentative.

(34) a.	ħank'əla:k'əl-a:	'become loose (teeth)'
b.	səndəldəl bela:	'rock, stagger'
c.	ʔanbədbəd-a:	'tremble, kindle fire'

4 Further Restrictions

There is a restriction in Tigre and Tigrinya that two guttural consonants may not occur in the same stem if they are separated by only a vowel (Raz 1983, Rose 2000b).¹⁰ For example, the causative prefix /ʔa-/ in Tigre (shown in (35a-b)) is not affixed to guttural-initial verb stems. Instead, the first vowel is lengthened (35c) (making it identical to the intensive form) or more commonly, the causative prefix is augmented with the reflexive-passive marker /t-/ (35d-e):

(35)	Type A		Causative	
a.	k'ətla:	'kill'	ʔa-k'təla:	'cause to kill'
b.	səbra:	'break'	ʔa-sbəra:	'cause to break'
c.	ħarsa:	'plough'	ħarəsa:	'cultivate'
d.	ʔak'ba:	'guard'	ʔat-ʔak'əba:	'cause to guard'
e.	ħadga:	'leave'	ʔat-ħadəga:	'make leave'

The restriction is also found in broken plural formation and with the 1st singular imperfective prefix. It also accounts for the lack of verbs in which the final two consonants are guttural, either identical (*Cʔʔ) or two different kinds of gutturals (*Cʔh). The exception to this is the formation of the frequentative, which flouts the restriction:

(36)	a.	baʔasa:	'fight'	baʔa:ʔasa:	'fight a little'
	b.	ʃahada:	'testify'	ʃaha:hada:	'testify a little'
	c.	saʃana:	'load'	saʃa:ʃana:	'load a little'

The importance of reduplication to realize the frequentative and set it apart from the intensive has been amply demonstrated. With no reduplication, the form would be interpreted as intensive: *baʔasa:* 'to fight a lot' (/ə + a/ --> [a:]). Therefore, the necessity of realizing the frequentative via reduplication outweighs the guttural restriction.

The same holds true for Tigrinya, primarily for speakers who prefer the longer template:

(37)	a.	k'wəlʃam-a	'snap in half'	k'wələʃaʃam-a	'snap in many pieces'
	b.	dərʃam-a	'destroy'	dərəʃaʃam-a	'destroy many things'
	c.	məzħaχ-a	'pull out, extract'	məzəħahaχ-a	'pull out many things'

This is in contrast to multiple reduplication, which is ruled out in Tigrinya quadrilaterals even for speakers who prefer the longer templates. See Rose (2000a) for an analysis.

5 Conclusion

In this paper, I have presented new data from Tigre, which illustrate that Tigre holds a unique position within the Ethiopian Semitic family with respect to its intensive and frequentative formation. The intensive is formed by infixation of the vowel [a:], whereas the frequentative is characterized by the same vowel in the same position, but with additional reduplication. The striking property of the frequentative in Tigre is that it may repeat the 'reduplicative syllable' as much as three times, each time with an attenuation of the basic meaning, conveying diminutive

¹⁰ Exceptions include the negative /ʔi-/ and the object clitics with epenthetic [h]: *ħu-hu* 'his brother'. See Rose (2000b) for explanation and analysis.

or elapsed time between action. I maintain that the relationship between the regular verbs and the frequentative argues for a derivation that relies on enriched infixation. The addition of the infix triggers a templatic shape requirement for stems with four or five consonants. This overrides many properties of the regular verb stem. In addition, the frequentative is subservient to the root and the realization of the full reduplicative syllable.

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