# Amharic Internal Reduplication and Foot Structure: A Word-Based Approach[1]

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## 1. Introduction

Most analyses of Semitic languages use a root-and-pattern approach to account for non-concatenative morphology, but this analysis of Semitic languages (i.e, triconsonantal roots) has recently become a subject of debate (cf. e.g, Ussishkin, 2006; Shimron, 2003; and references therein). This debate can be summed up as an opposition between the observed facts of the language, which seem to support an elegant and simple root-and-pattern approach which takes the abstract root as a lexeme, and the desire to use linguistic universals to account for the data in a less language-family-specific way based on whole words as lexemes. Amharic, an Ethio-Semitic language of Ethiopia, has been analyzed with the root-and-pattern method, just like other Semitic languages. A word-based account, however, which does not refer to an abstract underlying root in derivations, will be shown to be a superior analysis for the reduplicative verb form in Amharic; in this case, the word-based account is both elegant and relatively simple.

Under a root-and-pattern analysis, the Amharic reduplicative verb is usually described as a reduplication of the second consonantal radical ($C_2$) with the vowel /a/. Leslau (2007) states:

> The reduplicative stem consists of the repetition of the 2nd radical. Its form in the triradical verbs is *säbabbärä* for types A, B, and C. The reduplicative stem expresses an intensive action, reduplication, repetition, frequency, or attenuated action. (p362)

Thus, from the root *flg* we can derive a reduplicated form as in example (1)[2].

| (1) | Root | Simple | Reduplicative | Gloss |
|---|---|---|---|---|
| | flg | fɛllɛg-ɛ | fɛ**<u>la</u>**llɛg-ɛ | 'want' |

However, in biconsonantal and quadriconsonantal roots, which are not uncommon in Ethio-Semitic languages, this root-and-pattern description is not adequate: a different formula must be given for each biconsonantal verb type along with the quadriconsonantal verbs. Many generative linguists also argue that the root-and-pattern approach treats the Semitic languages as unique amongst the world's languages and suggest a universalist approach is better (e.g, Bat-El, 2003). Rose (2003a) suggests that a mixed approach is best, since the reduplicative pattern in Ethio-

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[2] Transcription in this paper has been regularized between sources to an IPA-based system, except in quotations where *ä* = [ɛ], *y* =[j], *ə* = [ɨ]. Other sources may use *ʌ* or *ə* for the phoneme represented here as *ɛ* and *ï* for [ɨ]. Reduplicated segments will be underlined for clarity.

Semitic languages cannot be accounted for by simple infixation which does not reference the root and verbal template. In Amharic, however, this is not the case: the form of the reduplicative stem can be predicted in a purely word-based approach. The root is still useful for categorizing words in Semitic languages, but need not play a part in their derivations.

This paper will show that a word-based approach is adequate to predict both the placement and quality of the reduplicative morpheme with particular attention paid to the so-called *hollow verbs* (i.e, words analyzed with biconsonantal roots which have lost their historically middle consonant). The implications for this are that scholars should consider abandoning some verbal morphology as root-and-pattern-based in favor of a more universal system.

A description of the reduplicative stem (§2) follows, then I will treat the root-and-pattern analysis (§3), my own word-based account (§4), implications of this word-based account (§5), and finally make a few concluding remarks (§6). Data is taken from Lelsau (1995) unless otherwise specified.

## 2. Background: the reduplicative or frequentative stem

### 2.1 Function of the reduplicative stem

The reduplicative or frequentative stem in Amharic "expresses an intensive action, reduplication, repetition, frequency, multiplicity of action, multiplicity of object, completion of an action, action preformed in a hurry, and attenuated action," (Leslau, 1995: 456). It often combines with the *tɛ-* prefix for a reciprocal meaning, and may combine with the *a-* prefix as well. It is distinct from other forms of reduplication in the language such as total reduplication (*t̠inif* 'little, small' *t̠inif t̠inif* 'very small') or biconsonantal reduplication (cf. Unseth, 2002).

### 2.2 The Shape of the Amharic reduplicative morpheme: [+CONS]a

The reduplicative morpheme is described as being a copy of the second root consonant followed by the vowel /a/. I will be assuming the shape of this morpheme as /[+CONS]a/ as well, where [+CONS] is simply an underspecified consonantal segment which will acquire its features via the phonology of the language (see section 4). This can be abbreviated to REDa.

As Banksira (2000) states, however, there is no real consensus on the form of the reduplicative morpheme in Ethio-Semitic languages. Ussishkin (2003) accounts for similar Arabic forms with simple moraic insertions. This type of morpheme, with a constant vowel and reduplicated consonant is not uncommon in the languages of the world, (a similar shape, though different placement is found in Somali) and often called a *duplifix*. This shape does not require formal theories of reduplication, though such notions can be used. The reduplicative notation for this form will be maintained as it is the traditional descriptive term for this pattern which refers to form, rather than the frequentative which refers to one usual semantic function of this morpheme. Thus, in prose, I may refer to this morpheme as reduplicative, but this should not be construed that formal or theoretic reduplication is necessary to account for this morpheme.

## 2.3 Note on Semitic roots

Semitic languages are usually described in terms of consonants, as they are the most constant element between derived forms. The mostly consonantal writing systems used by the majority of Semitic languages highlight this phenomenon. Even in transliteration, this is easy to see; Arabic shows the quintessential example from the root *ktb* 'having to do with writing' in figure 1:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| / | k | | t | | b | / | (Arabic) |
| | k | a | t | a | b | a | 'he wrote' |
| | k | aa | t | a | b | a | 'he caused someone to write' |
| | k | a | tt | a | b | a | 'he wrote letters to |
| 'a | k | | t | a | b | a | 'he dictated' |
| ta | k | | t | a | b | a | 'he corresponded with' (reciprocal) |
| in | k | a | t | a | b | a | 'he subscribed' |
| i | k | ta | t | a | b | a | 'he copied' |
| ista | k | | t | a | b | a | 'he had a copy made' |
| | k | i | t | aa | b | | 'book, document' |
| | k | u | t | u | b | ii | 'bookseller' |
| | k | u | t | ayyi | b | | 'booklet' |
| ma | k | | t | u | b | | 'office, bureau' |
| ma | k | | t | u | b | a | 'library' |
| mi | k | | t | aa | b | | 'typewriter' |
| ma | k | | t | uu | b | | 'written down; fated' |
| | | | | | | | (Wehr 1994:812-3) |

**Figure 1:** Graphic representation of the root relation between words in Arabic.

Taking the Semitic root as solely consonantal is common, but somewhat controversial today (cf. Ussishkin, 2006; and references therein). Nonetheless, even if just an abstraction, the root does provide a useful way to categorize words. Herein any reference made to a *root* or *root type* is merely a reference to the category of word. The term *stem* will be used for the uninflected verbal base. Non-epenthetic vowels are assumed to be part of the stem. In this analysis I assume that the verbal stem, which often includes vowels, is the lexical item that is selected along with the reduplicative morpheme.

There are three types of biconsonantal roots: those lacking a first, second, or third consonant. An analysis of related languages clearly shows that many of these verbs with biconsonantal roots arise from historically lost sub-velar (e.g. [χ, ʁ, ʕ, ħ]) consonants.

## 2.4 Placement of the reduplicative morpheme

The data below in Figure 2 show the simple and reduplicative perfective forms in five basic root types in Amharic.

| | Root 123(4) | Simple Perfective | Reduplicative Perfective | Gloss |
|---|---|---|---|---|
| **Biconsonantal** | -sr | assɛr-ɛ | a[illegible]ssɛr-ɛ | 'tie, imprison' |
| | s-m | sam-ɛ | [illegible]sam-ɛ | 'kiss' |
| | sm- | sɛmma- | sɛ[illegible]mma- | 'hear' |
| **Triconsonantal** | flg | fɛllɛg-ɛ | fɛ[illegible]llɛg-ɛ | 'want' |
| **Quadriconsonantal** | mnzr | mɛnɛzzɛr-ɛ | mɛnɛ[illegible]zzɛr-ɛ | 'exchange money' |

**Figure 2:** The reduplicative form across five different root types.

I have found no clear examples of this morpheme in roots with five or more consonants, which often exhibit another form of reduplication[3]. In each case, using root and pattern morphology, each type of verbal root may require its own template for derivation. Triconsonantal, quadriconsonantal and biconsonantal -23 and 12- roots may take part of a longer template form with gemination in the parsing foot, but, crucially, biconsonaltal hollow roots do not quite fill the same general (CV)(CV)CVCCVC template, even in their reduplicated form which does not show gemination. Figure 3 shows this; R stands for [+cons] for visual clarity.

| Root Type | Reduplicant | Basic Stem | Pattern | Reduplicative Stem | Pattern |
|---|---|---|---|---|---|
| -23 | C2 | assɛr | CvCCvC | a**sa**ssɛr | v**Ra**CCvC |
| 1-3 | C1 | sam | CvC | **sa**sam | **Ra**CvC |
| 12- | C2 | sɛmma | CvCCv | sɛ**ma**mma | Cv**Ra**CCv |
| 123 | C2 | nɛggɛr | CvCCvC | nɛ**ga**ggɛr | Cv**Ra**CCvC |
| 1234 | C3 | mɛnɛzzɛr | CvCvCCvC | mɛnɛ**za**zzer | CvCv**Ra**CCvC |

**Figure 3**: The reduplicative templates.

## 3. Root-and-Pattern Analysis

A traditional descriptive analysis (resting on Arabic, Hebrew, and Syriac grammatical traditions) has trouble with discussing the placement of the reduplicative morpheme because some biconsonantal verbs are often analyzed as not having a second consonant (i.e, they are hollow verbs). Thus, *nɛggɛrɛ* has three consonants $n_1g_2r_3$, while *samɛ* only has two, $s_1m_3$. This obviously may represent an historical account, but the $s_1m_3$ root *samɛ* 'kiss' must be analyzed differently than the $s_1m_2$ root *sɛmma* 'hear' when words are deconstructed to a consonantal root. A word-based approach does not need this distinction; the basic form of the stem is considered the lexical item, and "defective" or non-triconsonantal roots are accounted for with the same process as strong triconsonantal roots.

[3] Unseth (2002) describes this as biconsonantal reduplication, wherein the last two root consonants appear duplicated. Like penultimate reduplication, this appears across the Semitic languages.

A traditional analysis proposes that the consonantal root is put into a new derivational pattern. Thus, from *fɛllɛg-ɛ* the consonants $f_1l_2g_3$ are extracted and crammed into the reduplicative pattern $C_1\varepsilon C_2aC_2C_2\varepsilon C_3$- yielding *fɛlallɛg-ɛ*.

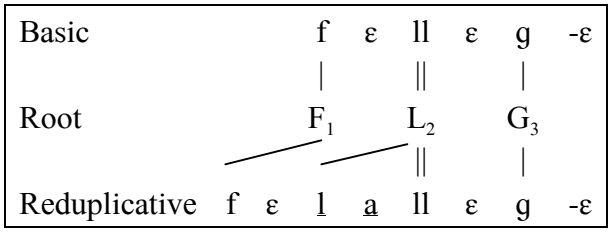


**Figure 4:** Root extraction.

In words with a biconsonantal root, such as *assɛrɛ* ($s_2r_3$), *samɛ* ($s_1m_3$), or *sɛmma* ($s_1m_2$), which do not fit the reduplicative pattern well, a number of theoretical approaches can be used to deal with missing consonants, that is, how to arrive at the forms: *a[redacted]ssɛrɛ*, *[redacted]samɛ*, or *sɛ[redacted]mma*. As described in Rose (2003a), different theoretical approaches posit a number of ways to maintain consonantal roots, such as null pharyngeal or laryngeal segments which surface as [a] (cf. Prunet, 1998; Unseth, 2002), that /a/ as a vowel is an underlying part of a tri-segmental root, rather than a triconsonantal root, or underspecified feature bundles (cf. Banksira, 2000). Unseth says that "underlying abstract consonants are counted in the reduplication," (3) but it is not clear how the derivation of *sasam-* from *sam-* counts Unseth's proposed middle segment of the root *sHm*. These approaches underscore the difficulties a root-and-pattern analysis can face when trying to maintain a triconsonantal or trisegmental root. Namely, these abstract segments still require their own rules or constraints to fit the root-and-pattern approach.

## 4. Word-Based analysis

A word-based analysis seeks to unify the variety of patterns into one coherent rule or constraint system without reference to abstract, underlying consonants. Very little in language can truly be simple, but this approach elegantly generates the reduplicative form. The first thing to notice in unifying these different verbal root types is that the reduplicative morpheme occurs in different places when counting from the left edge of the word, but not when counting from the right of the word. This is consistent with data from other Semitic languages (cf. Moscati et al, 1964). In other words, one could say this morpheme targets the first consonant of a biradical stem, second in a triradical stem, or third in a quadriradical stem or that it simply targets the second consonant from the right, i.e, the penultimate consonant, in all stems. This is shown in Figure 5.

| | | | |
|---|---|---|---|
| Biradical | Reduplicate the first consonant. | sam- | **sa**sam- |
| Triradical | Reduplicate the second consonant. | nɛggɛr- | nɛ**g**aggɛr- |
| Quadriradical | Reduplicate the third consonant. | mɛnɛzzɛr- | mɛnɛ**za**zzer- |

**Figure 5**: Second versus penultimate reduplication.

Even this more sophisticated system of reduplicating the penultimate consonant, however, fails to be the simple rule to account for the data, because one must specify whether this reduplication occurs to the right or the left of the consonant in question.

| | | Right of the Penultimate | Left of the Penultimate |
|---|---|---|---|
| 1-3 | samɛ | *s[redacted]amɛ | [redacted]samɛ |
| 123 | nɛggɛrɛ | *nɛgg[redacted]ɛrɛ | *nɛg[redacted]gɛrɛ |
| 1234 | mɛnɛzzɛrɛ | *mɛnɛzz[redacted]ɛrɛ | *mɛnɛz[redacted]zɛrɛ |

**Figure 6:** The reduplicative morpheme left of the penultimate consonant.

The data is problematic, as neither approach is adequate. Note too, that gemination also counfounds describing the location of this morpheme. Gemination is phonemic in Amharic, but Leslau considers this to be morphologically conditioned and non-contrastive in verbs. (1995:11-13). If the geminate segments are considered two distinct segments (which is not the root-and-pattern analysis), which one is considered the second radical consonant? A word-based account must consider the options that the geminate is two underlying segments.

| | | Right of the antepenultimate | Left of the antepenultimate |
|---|---|---|---|
| 1-3 | samɛ | NA | NA |
| 123 | nɛggɛrɛ | *nɛg[redacted]gɛrɛ | nɛ[redacted]ggɛrɛ |
| 1234 | mɛnɛzzɛrɛ | *mɛnɛz[redacted]zɛrɛ | mɛnɛ[redacted]zzɛrɛ |

**Figure 7:** The reduplicative morpheme left of the antepenultimate consonant.

Even if the geminates are considered two instances of one consonant, troubles still arise. There is no geminated consonant in biconsonantal hollow roots, as shown in Figure 8.

| | | Right of the geminate | Left of the geminate |
|---|---|---|---|
| 1-3 | samɛ | NA | NA |
| 123 | nɛggɛrɛ | *nɛgg[redacted]ɛrɛ | nɛ[redacted]ggɛrɛ |
| 1234 | mɛnɛzzɛrɛ | *mɛnɛzz[redacted]ɛrɛ | mɛnɛ[redacted]zzɛrɛ |

**Figure 8:** The reduplicative morpheme left of the geminated consonant.

The placement of this morpheme cannot be adequately described as a reduplication of the penultimate root consonant; it must be described as left of either the penultimate non-root consonant or the geminated consonant. Clearly, as Rose (2003a) and Rose (2003b) indicate, this cannot be handled by a simple process of infixation, and earlier descriptive accounts are unclear on how this morpheme can be accurately generated. Even theoretical root-and-pattern accounts have difficulties when abstract underlying (i.e, absolutely neutralized) phonemes are posited. A more sophisticated analysis is called for.

This reduplication can be explained when the verbs are looked at from a suprasegmental perspective: the second syllable from the right contains the reduplicative morpheme. In order to

correctly predict the location of this morpheme, I assume a bisyllabic parsing foot (cf. Buckley, 2000 for Tigrinya). Figure 9 shows the location of the parsing foot in relation to the reduplicative morpheme in the verbal stem.

| | | | |
|---|---|---|---|
| a | . (sas | . | sɛr) |
| | (sa | . | sam) |
| sɛ | . (mam | . | ma) |
| fɛ | . (lal | . | lɛg) |
| mɛ | . nɛ . (zaz | . | zer) |

**Figure 9:** Assumed parsing foot and the stem.

### 4.1 Stress

This foot follows from information on Amharic stress. Hayward (1992) tackles the view of Amharic as a tone language (Abraham, 1942), but does not come to any firm conclusions on the stress of Amharic. Leslau (1995:44-5) indicates that "Amharic has an almost even distribution of stress on each syllable." Leslau goes on to indicate, however, that "the syllable preceding a geminated syllable is likely to be stressed." Affixes do not generally interact with stress, and those that do are not verbal forms. Leslau finally says, "The question of the accent in Amharic still awaits a thorough investigation."

Mullen (1986), however, describes Amharic stress at length and in terms of syllable weight, with the notable observation that Amharic stress in verbs is not affected by the addition of affixes or clitics of any sort. Stress is always on the verb-stem, and is always fixed in position. Mullen describes Amharic stress as "weak stress" which does not appear to correlate with all the features of stress in other languages. Mullen very clearly states that stress exists in Amharic. Regardless of any morphological operation, "stress remains on the verbal stem," (Mullen 1986:171). Related languages appear to have right-aligned feet; Banksira (2000) reports penultimate stress for Chaha.

This assumption fits the observation that stems and feet tend to be of the same size (c.f Downing, 2006; and references therein). This assumed foot, then, appears to correlate with the data on Amharic stress, and it should be taken into account in future research on stress in Amharic.

### 4.2 An OT account

The complex nature of the reduplicated verb form can be accounted for with a more sophisticated constraint-based theoretical approach (i.e, Optimaliy Theory, cf. Prince and Smolenksi, 1993), rather than a simple rule-based one. By using two key alignment constraints (cf. Rose, 2003a) and assuming a specific prosodic structure (i.,. a bisyllabic parsing foot, cf. Buckley, 2000), the reduplicative form can be accounted for in all verbal forms with one simple process which is based on two essential constraints:

(2) ALIGN-REDa-FT ALIGN(REDa, LEFT; FOOT, LEFT)
The left edge of the reduplicative morpheme must align with the left edge of some prosodic foot.

(3) ALIGN-FT ALIGN(FOOT, RIGHT; STEM, RIGHT)
The right edge of every prosodic foot must align with the right edge of the verbal stem.

Not only do these constraints accurately predict the location of the reduplicated morpheme in strong triconsonantal roots, but also in biconsonantal and quadriconsonantal roots. Furthermore this analysis can predict the quality of the reduplicative morpheme as well (contra Rose, 2003a). Given the input: /sɛmma+REDa/, the alignment constraints enforce the optimal output: [sɛ.(REDam.ma)]. The quality of the reduplicated segment will be identical to the following consonantal segment (i.e, the tautosyllabic segment or segments within the same prosodic foot) with the vowel [a]: [sɛ(mam.ma)].

### 4.3 Alignment of the foot

The foot type I am assuming is a binary foot which is aligned to the right edge of the stem. Two constraints are needed to properly align this[4] parsing foot: ALIGN-FT (3) and FTBIN (4).

(4) FTBIN
A foot consists of exactly two syllables.

Tableau 1 shows constraints (2) and (3), which enforce the assumed optimal candidate b. These constraints are unranked with respect to one another. From the input stem *mɛnɛzzɛr-*[5], four possible outputs are generated. Candidate (b) is the optimal candidate (marked with an arrow); it shows no violations (indicated with an asterisk) of either constraint.

| | /mɛnɛzzɛr/ | ALIGN-FT | FTBIN |
|---|---|---|---|
| a. | (mɛ.nɛz).zɛr | *** | |
| → b. | mɛ.(nɛz.zɛr) | | |
| c. | (mɛ.nɛz.zɛr) | | * |
| d. | mɛ.nɛz.(zɛr) | | * |

**Tableau 1**: Assumed prosodic structure.

[4] Mullen (1986) doesn't discuss the possibility of secondary stress, or the acoustic correlates of stress, merely the location of primary stress. She proposes that there is only one foot per prosodic word and degenerate feet aren't allowed, and makes use of a level approach wherein verb stems are footed first and any affixes do not alter stress. For this analysis, the existence or nonexistence of other feet is irrelevant. I will align this morpheme with both the foot and the stem; other possible feet will be ignored.

[5] Technically, the input should include inflection suffixes. Final stem consonants can be considered extrametrical to the foot, however. Crucially, non-stem material is not allowed within the foot: *mɛ.(nɛz.zɛ).r-ɛ* not **mɛ.nɛz.(zɛ.r-ɛ)* (cf. Mullen, 1986).

A further constraint, ALIGN-REDa-FT, as seen in (2), will enforce the reduplicative morpheme's position with respect to the foot. Tableau 2 shows five output candidates and their violations[6] of ALIGN-REDa-FT.

| | /fɛllɛg + REDa / | ALIGN-REDa-FT |
|---|---|---|
| | a. la.(fɛl.lɛg) | l!a |
| → | b. fɛ(lal.lɛg) | |
| !← | c. fɛl(la.lɛg) | |
| | d. fɛl(lɛ.lag) | l!ɛ |
| | e. fɛl(lɛg.la) | l!ɛg |

**Tableau 2:** Alignment of the reduplicative morpheme.

ALIGN-REDa-FT alone is not quite adequate, since both candidates (b) and (c) in Tableau 2 are equally optimal; both candidates have no violations of ALIGN-REDa-FT. Another constraint is needed to distinguish between these candidates. That constraint is seen in (5). Note also that here I assign no special status to geminate consonants; each is considered an individual segment.

(5) ALIGN-REDa-ST ALIGN(REDA, LEFT; STEM, LEFT)
The left edge of the reduplicative morpheme must align with the left edge of the verbal stem.

A ranking argument, however, must be made between these constraints. Were ALIGN-REDa-ST ranked above ALIGN-REDa-FT, candidate (a) in Tableau 3 would be the winner, though it is incorrect and not an occurring form in Amharic.

| | /fɛllɛg + REDa / | ALIGN-REDa-ST | ALIGN-REDa-FT |
|---|---|---|---|
| → | a. la.(fɛl.lɛg) | | la |
| !← | b. fɛ(lal.lɛg) | f!ɛ | |
| | c. fɛl(la.lɛg) | f!ɛl | |

**Tableau 3:** Argument for ALIGN-REDa-FT >> ALIGN-REDa-ST.

A biconsonantal verb of the type 12-, which lacks a third root consonant, shows this ranking in Tableau 4 as well, with the correct ranking of ALIGN-REDa-FT >> ALIGN-REDa-ST.

| | /sɛmma + REDa / | ALIGN-REDa-FT | ALIGN-REDa-ST |
|---|---|---|---|
| | a. sa.(sɛm.ma) | s!a | |
| → | b. sɛ.(mam.ma) | | sɛ |

**Tableau 4:** ALIGN-REDa-FT >> ALIGN-REDa-ST

[6] These alignment constraints are gradiently violable and their violations will be marked with the offending segments.

Candidate (a) in Tableau 4 shows two violations of ALIGN-REDa-FT, but crucially there is a fatal violation in (a) due to the constraint ranking. Candidate (b), the optimal candidate, shows two violations of ALIGN-REDa-ST, but it is the occurring candidate; ALIGN-REDa-ST must be ranked lower than ALIGN-REDa-FT.

These constraints also hold for biconsonantal hollow stems that cannot duplicate a supposed null or vocalic underlying segment. Tableau 5 shows the optimal candidate, (a), has no violations of either of these constraints.

| | /sam[7] + REDa / | ALIGN-REDa-FT | ALIGN-REDa-ST |
|---|---|---|---|
| → a. | (sa.sam) | | |
| b. | (sa.mam) | s!a | sa |

**Tableau 5:** The hollow verb in the reduplicative stem.

The ranking of these constraints are summarized in Figure 10.

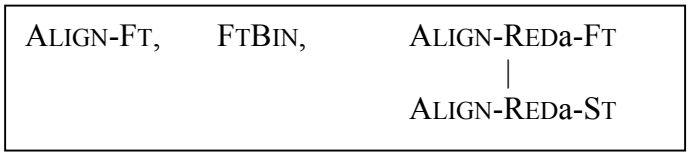


**Figure 10:** Summary of constraints.

### 4.4 The Jussive problem

Rose (2003a) indicates the hollow jussive stem is particularly problematic for a word-based approach. On the surface, this is damning, as it appears impossible to properly predict the lack of a full vowel; a full vowel is found in the simple jussive of the hollow stem (e.g, jɨ -sam), but not in the reduplicative jussive (jɨ-sasɨm, *jɨ-sasam). This is problematic for a word-based approach.

Like other Semitic languages, many Amharic jussive forms show a stem with one fewer mora than the imperfective stem. Shortened jussives may be a case of dissimilation to distinguish the imperfective and jussive in the more common simple form, which may be neutralized in the less frequent reduplicative jussive. This phenomenon may also be tied to issues of historical vowel length which has been lost in modern Amharic. Compare the Arabic data (Wehr, 1996) in Figure 12 to the Amharic forms in Figure 12[8].

[7] Hollow verbs seem to have a degenerate foot (cf. Mullen, 1986). Here I allow the reduplicative morpheme to fully parse the stem since reduplication functions more like compounding than affixation (Downing, 2006; and references therein)

[8] Classical Hebrew also shows similar shortenings in hollow verbs (e.g, jə quum vs. jəqum) and in *hiphʿil* stems.

| Root Type | 1-3 | 12- | 12- | 12- |
|---|---|---|---|---|
| Imperative | jiquum | jarmii | jalqaa | jadʕuu |
| Jussive | jiqum | jarmi | jalqa | jadʕu |
| | 'stand' | 'throw' | 'meet' | 'call' |

**Figure 11:** Moraic loss in the Arabic jussive.

| | (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|---|---|---|---|---|
| Root Type | $123_a$ | $123_b$ | $123_c$ | $12\text{-}_a$ | $12\text{-}_b$ | 1-3 |
| Imperative | jɨsɛb(ɨ)r | jɨfɛllɨg | jɨmarrɨk | jɨsɛma | jɨlɛjj | jɨsɨm |
| Jussive | jɨsbɛr | jɨfɛllɨg | jɨmar(ɨ)k | jɨsma | jɨlɛjj | jɨsam |

**Figure 12:** Moraic loss in the Amharic jussive.

Amharic has three classes of verbs which show slight differences in morphology: type A, which does not show gemination in the imperfective; B, which does show gemination in the imperfective; and C, which is generally similar to B except it shows an [a] vowel instead of [ɛ] in the penultimate stem syllable (e.g. *dɛballɛk'-ɛ* not **dɛbɛllɛk'-ɛ* 'mix'). Hollow root verbs seem to pattern as a type A stem.

It follows from the data in Figure 12 that there is another constraint on the derivation of the jussive which militates for a mora reduction in some forms of the jussive. This moraic loss is supported by the fact that the epenthetic vowel (ɨ) is not always found in the jussive, which leaves otherwise unacceptable consonant clusters intact. That language specific constraint can be modeled as JUSSIVESHORTENING, seen in (6).

(6) JUSSIVESHORTENING Eliminate a mora in Jussive type A or C stems derivations.

This constraint militates for metathesis in triconsonantal type A verbs (Figure 12a), while deletion is preferred in triconsonantal type C verbs (Figure 12c) and Biconsonantal 12- type A verbs (Figure 12d). In the hollow verb (Figure 12f), we see [a] replaced by [ɨ ]. This is also a case of deletion, since [ɨ] is an epenthetic vowel. Interestingly, jussive shortening does not occur with the type B verbs (Figure 12b and e) or the regular 1-3 type.

This is the same phenomenon in the case of the reduplicative jussive; the full vowel of *jɨ-sam* is deleted and replaced by the epenthetic vowel in *jɨ-saɨm*. JUSSIVESHORTENING leaves the reduplicative jussive identical to the reduplicative imperfective. In each case, a moraic loss can explain a shortened jussive form. Type C verbs may show this shortening with their loss of the [a] quality vowel, which was historically long.

Further research in Amharic stress and its relation to the foot, including loan and nonce words, may shed light on this problem. Though lexically fossilized formed need not be accounted for in a word-based theory, it must accurately predict novel forms. It is worth noting, however, that reduplication tends to function more like compounding than affixation (cf. Downing, 2006; and references therein) and that may account for unexpected alternations.

### 4.5 Hollow verbs with medial glides

Hollow verbs are best analyzed as biconsonantal roots, not triconsonantal roots in Amharic. The round feature of velar consonants can alternately be expressed on the consonant or vowel, thus *k'omɛ*[9] and *k'ʷamɛ* are two pronunciations of the same word 'come'. These biconsonantal words clearly follow the derivational pattern of words like *samɛ,* rather than the triconsonantal pattern. Contra Unseth (2002), medial abstract consonants are not counted in this reduplication. Figure 13 shows this graphically. There is also a question of root-faithfulness (cf. Rose, 2003b), as the root *k'wm* duplicates two segments; the root *k'ʷ-m* only duplicates one.

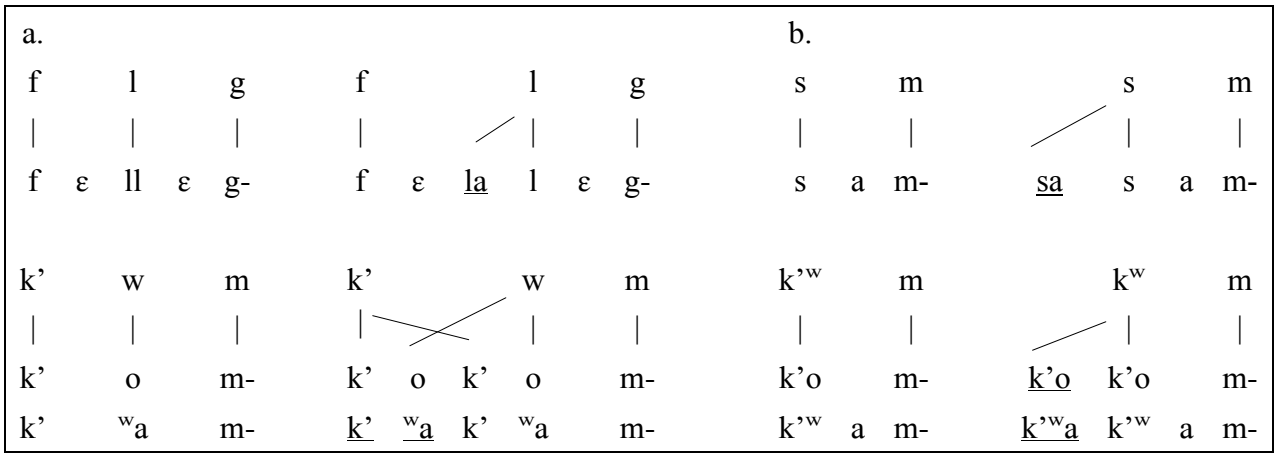


**Figure 13:** Root associations.

## 5. Implications

What this analysis implies, first and foremost, is that a word-based analysis is a possible method to account for these weak verbs. This is done with an infixation system that does not need to reference hypothetically underlying root consonants in any way. Proponents of a root-based morphology for Semitic languages should take note, as all aspects of Semitic verbs need not refer to patterns, and this may cut down on the necessary number of verbal stems to account for the language. This analysis by no means ruins a root-and-pattern analysis; it merely suggests a refinement in terms of this morpheme (and potentially others) as an infix. There are many ways of analyzing Semitic roots; Aronoff (2007) states: "there is a middle ground, where words have morphological structure even when they are not compositionally derived, and where roots are morphologically important entities, though not particularly characterized by lexical meaning."

Furthermore, a word-based account should also be explored in other Semitic languages. The reduplicative morpheme does occur, though rarely, in Akkadian (Kienast, 1957). The Akkadian form is *iparras* and *upar<u>ar</u>ras* when reduplicated. A similar analysis could be used to account for the Akkadian version as well. Whether or not this can be said to be stress-related in Akkadian, however, remains to be seen. Additional candidates for further study include the relation between the *Pi'el* and *Polel* stems in Hebrew, which appear semantically identical though

[9] The reduplicative imperfective and jussive of this are both *ji-kʷakʷim* (Sharon Rose, personal communication); this follows the other 1-3 (i.e. *sam-*) type.

morphologically disparate, or biconsonantal reduplication (e.g. Hebrew *pilpel* verbs, cf. Unseth, 2002). A word-based analysis may be able to unify these or other instances of reduplication based on supersegmental phenomena, whether synchronically or diachronically.

Also, the relationship between orthography or literacy and morphophonology must be explored further. As all the Semitic languages except Maltese use a mostly consonantal orthography (cf. section 2.3), Psycholinguistics studies (cf. Prunet, Béland and Idrissi, 2006; and reference therein) which support a consonantal root may not take into account research on the effect of literacy on phonology (Tarone and Bigelow, 2005). Triradicalism might only be obvious because of this accident of history. Recent studies seem to show conflicting data supporting both the cognitive reality of the root and the priority of the word (cf. Ussishkin, LaCross and Brewer, 2008).

In this word-based analysis, I do not advocate for the elimination of the consonantal root altogether. Such an analysis may, however, be deconstructing words further than is necessary to account for all the data, and consonantal roots have already been argued to lack lexical meaning (cf. Aronoff, 2007; and references therein). Consonantal roots certainly have merit for categorizing verbal types synchronically or diachronically, among other uses. What may be best avoided, however, is a rigid classification of first, second, and third root consonants and operations that target one or more of these. One desideratum, however, is still a clear and formal method of analysis which can treat all words of a particular Semitic language in the same way, to say nothing of treating derivations just as one would treat derivations of a non-Semitic language which are not reduced to consonantal roots and patterns. Morphological ablaut occurs in many other languages (e.g. *sing*, *sang*, *sung* in English); Semitic languages just show a radical case of this. Furthermore, while roots may have morphological significance, not every derived form must make use of them. In fact, roots may not be the basic meaningful unit of language in general, or Semitic languages in particular (cf. Aronoff, 2007). It is perhaps best to think of the root not as an underlying abstract morpheme, but as the means of linking disparate word forms within the lexicon.

## 6. Conclusion

In natural language, new words are coined and this word-based analysis allows for neologisms without reference to morphological roots or individual consonantal positions within those roots. Empirically, the reduplicative stem is better described in terms of prosody or suprasegmental structure: the reduplicative verb is formed with the reduplicative morpheme, a consonant + /a/, in the penultimate syllable with the consonantal portion of the morpheme featurally identical to the following consonant.

This analysis requires the use of a parsing foot. The foot structure assumed here has some precedence (cf. Buckley, 2000 for Tigrinya) and is supported by the sparse information available on stress in Amharic (Leslau, 1995; Mullen , 1986) as well as the observation that stem size correlates with foot size in prosodic morphology (cf. Downing, 2006). The foot hypothesis should be taken into account in future work on Amharic stress, which requires further documentation.

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