

# The morphological structure of the Moro verb

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## 1. Introduction<sup>1</sup>

The verb structure of Kordofanian languages is complex, consisting of a root and a large number of affixes. In the Thetogovela dialect of Moro, the structure is as follows:<sup>2</sup>

- (1) COMP-SM-CLASS-CLAUSE-AMD-OM/PROG-ITER-ROOT-  
AP-LOC.APPL-CAUS-APPL-PASS-AMD-PL-OM-INST-LOC

In this paper, the basic morphological structure of the Moro verb is outlined, and a wide range of affixes and constructions are presented and discussed. Special attention is paid to the role of phonology, particularly tone and vowel harmony, whose distribution serves to delimit domains within the verb.

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<sup>2</sup> Abbreviations: ADJ = adjectival; AMD = aspect/mood/deixis; AP = antipassive/reciprocal/distributive; APPL = benefactive applicative; CAUS = causative; CL = noun class; COMP = complementizer; CONS = consecutive; DU = dual; EXC = exclusive; IMP = imperative; INC = inclusive; INST = instrumental; IPFV = imperfective; ITER = iterative/durative; LOC = locative, LOC.APPL = locative applicative; OC = object case; OM = object marker, PASS = passive; PFV = perfective; PL = plural; PROG = progressive; PROX = proximal; RTC = root clause; DPC = dependent clause; SG = singular; SM = subject marker; SUB = subordinate.

Moro is classified as Western Heiban as part of the Kordofanian language family. Although some researchers have questioned the unity of Kordofanian (Blench, this volume), Moro is closely related to other Heiban languages, in particular, Tira. Moro is recognized as divided into seven different dialects, corresponding to tribal names. The particular dialect under study in this paper is Thetogovela, spoken in the area northeast of the main town of Umm Dorein. This is the dialect identified as Umm Gabralla (Toberelda) in *Ethnologue* (Lewis 2009) and as Tobəɾelda in Blench (2005). Two Moro speakers, Elyasir Julima and Ikhlas Elahmer, provided the data presented in this paper, from the villages of Karakaray and Ikurchi, respectively.

## 2. Aspect/mood/deixis forms and melodic tone patterns

The verb root can never appear alone, but must combine minimally with an aspect/mood/spatial deixis (AMD) suffix. In this section, we examine four such AMD constructions, each of which has a different tonal pattern, which we term *melodic tone*. Most Moro verb roots take the shape (C)VC and (C)VCVC, although the first vowel may be a diphthong and the first or second consonant may be geminate or be expanded to a consonant cluster (CC). There are also short roots consisting of only a consonant, which is usually geminated, and there are some longer roots, which appear to have incorporated lexicalized extension suffixes.

### 2.1 Imperative

Thetogovela Moro has two kinds of imperatives, the proximal/itive imperative and the distal/ventive imperative, distinguished by both tone and a final suffix. The proximal imperative is used for actions that are near to the speaker, or indicate motion away from the speaker. The distal/ventive is used for actions that are far away from the speaker or indicate motion towards the speaker. It can also be used to indicate emotional distance or lack of involvement in the action. We will use the terms ‘proximal’ and ‘distal’ to refer to these forms. The proximal form is the default form; it is more common, and is the form used when location or motion is unexpressed. This type of distinction is also found in the imperfective, and in some subordinate constructions in Moro. Verbal spatial deixis categories are also found in other Kordofanian languages such as Koalib (Quint 2006, 2009) where it is labeled centripetal/centrifugal, as well as Nilo-Saharan languages, particularly Nilotic languages (Dimmendaal 2003).

The proximal imperative is formed from the verb root and a final suffix -ó. All tone-bearing units in the proximal imperative verb stem bear high tone, which is marked with an acute accent (´). Low tone is unmarked. Moro has a two tone system, High (H) and Low (L). Jenks & Rose (2011) analyze it as a H vs. Ø system, where Ø is unmarked.

- |                       |         |                     |               |
|-----------------------|---------|---------------------|---------------|
| (2) a. <i>váleð-ó</i> | pull!   | h. <i>ábár-ó</i>    | fly!          |
| b. <i>táḡát-ó</i>     | lick!   | i. <i>ódáḡn-ó</i>   | squat!        |
| c. <i>págáð-ó</i>     | pay!    | j. <i>ámáddát-ó</i> | help!         |
| d. <i>tʃómbáð-ó</i>   | tickle! | k. <i>érl-ó</i>     | walk!         |
| e. <i>váð-ó</i>       | shave!  | l. <i>ár-ó</i>      | cry!          |
| f. <i>gáḡn-ó</i>      | kill!   | m. <i>áf-ó</i>      | build, shoot! |
| g. <i>lánɖ-ó</i>      | close!  | n. <i>óg-ó</i>      | thresh!       |

Verb roots with high vowels *i* *ɛ* *u* and some *ə*, cause the final suffix -ó to be realized as raised *ú*. This is part of the general vowel harmony system in Moro, whereby the higher vowels *i* *ɛ* *u* trigger raising of the lower vowels *e* *a* *o* to *i* *ɛ* *u*. The vowel *ə* participates in both types of harmony patterns, as seen by a comparison of (2c) and (3b).

- |                        |                     |                   |           |
|------------------------|---------------------|-------------------|-----------|
| (3) a. <i>máḡláf-ú</i> | peel, remove layer! | h. <i>áwút-ú</i>  | throw!    |
| b. <i>rágáḡn-ú</i>     | work!               | i. <i>ílið-ú</i>  | buy!      |
| c. <i>wúndát-ú</i>     | wring!              | j. <i>áḡláf-ú</i> | show!     |
| d. <i>sáð-ú</i>        | defecate!           | k. <i>ándúð-ú</i> | bite!     |
| e. <i>kíð-ú</i>        | open!               | l. <i>úrtáð-ú</i> | pull out! |
| f. <i>túnd-ú</i>       | cough!              | m. <i>íð-ú</i>    | make!     |
| g. <i>dár-ú</i>        | wrap, cover!        | n. <i>ág-ú</i>    | put!      |

The distal imperative is formed from the verb root and the suffix -a. This vowel is raised to *ɛ* when attached to roots with high vowels. The entire verb form is low-toned<sup>3</sup>.

- |                       |                     |                              |               |
|-----------------------|---------------------|------------------------------|---------------|
| (4) a. <i>vəleð-a</i> | pull!               | i. <i>abər<sup>w</sup>-a</i> | fly!          |
| b. <i>pəgəð-a</i>     | pay!                | j. <i>amadaɖ-a</i>           | help!         |
| c. <i>vað-a</i>       | shave!              | k. <i>ar-a</i>               | cry!          |
| d. <i>gəḡn-a</i>      | kill!               | l. <i>af-a</i>               | build, shoot! |
| e. <i>məḡláf-ɛ</i>    | peel, remove layer! | m. <i>ɛwut-ɛ</i>             | throw!        |
| f. <i>rəgəḡn-ɛ</i>    | work!               | n. <i>ilið-ɛ</i>             | buy!          |
| g. <i>səð-ɛ</i>       | defecate!           | o. <i>ənduð-ɛ</i>            | bite!         |
| h. <i>dər-ɛ</i>       | wrap, cover!        | p. <i>əg-ɛ</i>               | put!          |

<sup>3</sup> When followed by a noun phrase, or an object marker, the final suffix vowel carries high tone.

## 2.2 Perfective

The perfective form of the verb also consists of the verb root and the suffix -ó (raised to [ú] by vowel harmony), but it is preceded by, at least, a root clause marker and a noun class concord marker. The following forms illustrate the 3SG perfective form of a number of different verb roots, marked with the default singular human class prefix *g-* (realized as *k* phrase-initially) and a finite clause marker *a-* in (5a-i). The class marker for 3<sup>rd</sup> person changes depending on the noun class of the subject (see Gibbard et al. 2009 for a discussion of Thetogovela Moro noun classes). The *a-* does not appear with the vowel-initial roots in (5j-r) due to vowel hiatus resolution which deletes the first in a sequence of two vowels.

- |        |                     |           |    |                  |              |
|--------|---------------------|-----------|----|------------------|--------------|
| (5) a. | <i>g-a-dogaṭ-ó</i>  | fix       | j. | <i>g-udaḷ-ú</i>  | milk         |
| b.     | <i>g-a-vəleḏ-ó</i>  | pull      | k. | <i>g-abatf-ó</i> | lift         |
| c.     | <i>g-ʌ-məṇʌtf-ú</i> | peel      | l. | <i>g-onḑəṭ-ó</i> | dry (intr.)  |
| d.     | <i>g-a-laləṇ-ó</i>  | run       | m. | <i>g-aṭf-ó</i>   | build, shoot |
| e.     | <i>g-a-vədaḏ-ó</i>  | sweep     | n. | <i>g-aləṇ-ó</i>  | sing         |
| f.     | <i>g-a-morṭf-ó</i>  | take from | o. | <i>g-id-ú</i>    | fall down    |
| g.     | <i>g-ʌ-ṭunḑ-ú</i>   | cough     | p. | <i>g-ur-ú</i>    | blow (intr.) |
| h.     | <i>g-a-waḏ-ó</i>    | poke      | q. | <i>g-al-ó</i>    | slice        |
| i.     | <i>g-a-saṭ-ó</i>    | chew      | r. | <i>g-a-m-ó</i>   | take         |

The 3PL human class prefix is *l-*, e.g. *l-a-dogaṭ-ó* ‘they fixed’. All 1<sup>st</sup> and 2<sup>nd</sup> persons have a fixed class marker *g-* like the forms in (5) do, but the *g-* is preceded by a subject marker, e.g. *á-g-a-vəleḏ-ó* ‘you (sg.) pulled’ or *ná-g-a-vəleḏ-ó* ‘you (pl.) pulled’. See section 5.3 for a complete list. As for the tone pattern, the verb root is low-toned for all perfective verbs. The perfective does not have a distal/proximal distinction.

## 2.3 Distal imperfective

Like the imperative, the imperfective has two different spatial deixis distinctions. We will consider first the distal imperfective in this section, because it closely resembles the perfective in form, and the proximal imperfective has a more complicated tonal system, to be addressed in section 3. The distal imperfective is identical to the perfective in terms of segmental make-up, but has an additional *á-* prefix with consonant-initial roots (6a-e) or, when this vowel is deleted, the H tone appears on the first vowel of the root with vowel-initial roots (6f-j).

- |        |                     |       |    |                  |              |
|--------|---------------------|-------|----|------------------|--------------|
| (6) a. | <i>g-á-dogaṭ-ó</i>  | fix   | f. | <i>g-údaḏ-ú</i>  | milk         |
| b.     | <i>g-á-vəleḏ-ó</i>  | pull  | g. | <i>g-ábatf-ó</i> | lift         |
| c.     | <i>g-á-lal:ən-ó</i> | run   | h. | <i>g-á'f-ó</i>   | build, shoot |
| d.     | <i>g-á-vədaḏ-ó</i>  | sweep | i. | <i>g-áləŋ-ó</i>  | sing         |
| e.     | <i>g-á-waḏ-ó</i>    | poke  | j. | <i>g-á'l-ó</i>   | slice        |

We assume that this is a separate distal imperfective prefix *á-* rather than a high tone that appears on the finite root clause vowel *a-*. This is due to the behavior of other clause markers. Relative clauses, clefts and some subordinate clauses are marked with *é-* or *ǎ-* rather than the finite root clause marker *a-*<sup>4</sup> (see section 5.1), e.g. *uǎǎí kévəleḏó*<sup>5</sup> ‘the man who pulled it’. The exception to this pattern is with distal imperfectives: *uǎǎí kávəleḏó* ‘the man who pulled it (over there)’. We surmise that vowel hiatus between the clause prefix and the distal imperfective prefix results in loss of the second vowel, the clause prefix: *k-é-á-vəleḏ-ó* → *kávəleḏó*. This is the same process that leads to the loss of the distal imperfective prefix (6f-j) adjacent to vowel-initial roots, as well as the clause vowel in (5j-r).

The four forms so far discussed all display different tone patterns depending on the aspect, mood or spatial deixis. We refer to this type of tone pattern as melodic tone, following similar terminology in the literature on Bantu languages (Odden 1989, Marlo 2007). The distinction between the proximal imperative and the perfective illustrates that while suffixes can be phonologically identical, the tone of the rest of the verb stem can differ.

(7)	ROOT + AFFIXES	TONE MELODY
Proximal imperative	[ROOT-ó]	[H-H]
Distal imperative	[ROOT-a]	[L-L]
Perfective	<i>g-a</i> -[ROOT-ó]	[L-H]
Distal imperfective	<i>g-[á-ROOT-ó]</i>	[H-L-H]

The hallmark of the melodic tone verbs is that no matter the nature of the verb root—its length or syllable structure, the tone pattern of the basic verb stem is the same. This is quite different from the next set of verb forms we will examine, in which tone patterns differ depending on the segmental and syllabic make-up of the verb root.

<sup>4</sup> The absence of *a-* could be a co-occurrence restriction or could be due to vowel hiatus resolution if the prefixes are ordered *a-é* or *a-ǎ*.

<sup>5</sup> The prefix *k-* instead of *g-* indicates ‘strong concord’; see Jenks (this volume).

### 3. Aspect/mood/deixis forms and default tone

The proximal imperfective has a final suffix *-a* and the same prefixes as found with the perfective. However, unlike the perfective and the distal imperfective, the tone patterns that appear on verb roots in the proximal imperfective are varied and complex. These have been discussed and analyzed at length in Jenks & Rose (2009, 2011). Here we outline the basic forms.

Verb roots of the shape CVCVC (long roots) have a HH pattern on the root. The final *a* may be raised to *ɐ* or *iə* with vowel harmony.

(8) CVCVC roots with light syllables: HH-L

a.	<i>g-a-távəð-a</i>	spit	k.	<i>g-ɐ-rəgən-iə</i>	work
b.	<i>g-a-kʷərəð-a</i>	scratch	l.	<i>g-ɐ-məpɐtʃ-ɐ</i>	peel
c.	<i>g-a-ləŋet-a</i>	know	m.	<i>g-ɐ-məlɐð-iə</i>	exchange, replace
d.	<i>g-a-vərəð-a</i>	rake	n.	<i>g-ɐ-rəmɐt-iə</i>	be blind
e.	<i>g-a-rəmɐtʷ-a</i>	tend	o.	<i>g-ɐ-rəmʷig-iə</i>	get drunk
f.	<i>g-a-dogət-a</i>	fix	p.	<i>g-ɐ-tiðən-iə</i>	slip
g.	<i>g-a-vələð-a</i>	pull	q.	<i>g-a-pəgəð-eə</i>	pay
h.	<i>g-a-nətəð-a</i>	be emaciated, waste away	r.	<i>g-a-ŋərəð-eə</i>	break off small piece, tap lightly
i.	<i>g-a-təŋət-a</i>	lick	s.	<i>g-a-ʧəpəð-eə</i>	be rotten
j.	<i>g-a-ləvətʃ-a</i>	hide			

The choice of final *-ɐ* or *-iə* does not appear predictable. Some roots (8q-s) show a final low *-eə* suffix, so diphthongs may have another source besides vowel harmony. The final consonant in all these long verb roots is usually one of a small class: *ð t tʃ n*; these are all consonants that appear in extension suffixes (section 6), so it is possible that these final consonants represent lexicalized extension markers.

There is a small set of CVCVC roots with a single H tone on the first syllable only. There are so few of these forms that it is hard to make any generalizations. These are exceptions to the more general HH pattern.

(9) HL pattern

a.	<i>g-ɐ-dɐdəð-ɐ</i>	hiccup	b.	<i>g-a-vədað-a</i>	sweep
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Short verbs of the shape CVC fall into two classes with respect to the distribution of H tone. While all verbs of this shape have H on the root vowel, H extends onto the final vowel for most verbs. This creates a lexical distinction between H-H and H-L melodies.

- |      |                   |                          |                            |
|------|-------------------|--------------------------|----------------------------|
| (10) | H-H pattern       |                          | H-L pattern                |
| a.   | <i>g-Λ-sáð-á</i>  | defecate                 | f. <i>g-a-tóð-a</i> move   |
| b.   | <i>g-a-wáð-á</i>  | poke                     | g. <i>g-a-váð-a</i> shave  |
| c.   | <i>g-a-nát-á</i>  | taste                    | h. <i>g-a-sát-a</i> chew   |
| d.   | <i>g-a-rát-á</i>  | clear land after harvest | i. <i>g-a-rát-eə</i> kneel |
| e.   | <i>g-a-boán-á</i> | like, want               | j. <i>g-a-noán-a</i> watch |

Another group of consonant initial verbs begins with a closed syllable, closed by a nasal, an *r* or a geminate consonant. In these cases, H tone is restricted to the closed syllable and does not extend beyond it to the following syllable. There are no exceptions to this pattern that we have found.

- |      |   |    |  |
|------|---|----|--|
| (11) | HL pattern with CVCCVC or H-L pattern with CVCC roots |    |  |
| a.   | <i>g-a-m<sup>w</sup>ándəð-eə</i> ask                  | g. | <i>g-a-wárð-a</i> write                |
| b.   | <i>g-a-wándaɾ-a</i> see                               | h. | <i>g-a-várt-a</i> lead, be in front of |
| c.   | <i>g-Λ-vándəɳ-a</i> snap, break                       | i. | <i>g-a-lánd-a</i> close                |
| d.   | <i>g-a-láləɳ-a</i> run                                | j. | <i>g-Λ-túnd-Λ</i> cough                |
| e.   | <i>g-Λ-láləð-iə</i> scatter                           | k. | <i>g-a-mórtf-a</i> take from           |
| f.   | <i>g-a-tfómbəð-a</i> tickle                           | l. | <i>g-a-kárm-a</i> find guilty and fine |

Finally, there is a group of consonant-only verb roots. As there is no root vowel that can bear H tone, these are all low-toned forms.

- |      |  |    |                                  |
|------|--|----|----------------------------------|
| (12) | C-only roots – no H tone                 |    |                                  |
| a.   | <i>g-a-mɿ-a</i> take                     | d. | <i>g-Λ-p<sup>w</sup>ɿ-Λ</i> beat |
| b.   | <i>g-a-rɿ-a</i> kick (once), pound, stab | e. | <i>g-Λ-tɿ-iə</i> drink           |
| c.   | <i>g-a-sɿ-a</i> eat                      |    |                                  |

Vowel-initial roots show a different tone pattern from the consonant-initial roots. Most vowel-initial roots with two vowels have a H tone only on the second vowel. This H tone does not extend to a following suffix.

- |      |                                   |    |                                   |
|------|-----------------------------------|----|-----------------------------------|
| (13) | LH pattern – V-initial verb roots |    |                                   |
| a.   | <i>g-ogát-a</i> jump              | d. | <i>g-abát<sup>w</sup>-a</i> climb |
| b.   | <i>g-obáð-a</i> run away          | e. | <i>g-udáð-Λ</i> milk              |
| c.   | <i>g-Λwút-Λ</i> drop              | f. | <i>g-abátf-a</i> lift             |

Recall that the clause marker *a-*, which marks finite clauses and normally precedes the root, is deleted by a regular hiatus process in which the first of two adjacent vowels deletes.

Vowel-initial roots that are of the shape VC have no H tone:

## (14) L-L pattern – VC roots

- |    |                |             |    |                |              |
|----|----------------|-------------|----|----------------|--------------|
| a. | <i>g-al-a</i>  | slice       | c. | <i>g-ur-ʌ</i>  | blow (intr.) |
| b. | <i>g-oað-a</i> | mill, grind | d. | <i>g-oar-a</i> | badmouth     |

If the initial syllable is closed, however, H tone does appear on the initial syllable:

## (15) H-L pattern with VCC and HL pattern with VCCVC roots

- |    |                  |              |
|----|------------------|--------------|
| a. | <i>g-ʌnd-iə</i>  | catch        |
| b. | <i>g-áf-a</i>    | build, shoot |
| c. | <i>g-ónðæt-a</i> | dry (int.)   |

Finally, there are a few VC and VCV roots that show a single H tone on an initial vowel only; some (16d,e) are borrowings from Arabic:

## (16) H-L and HL exceptional pattern with VC or VCV roots

- |    |                 |  |
|----|-----------------|--|
| a. | <i>g-oás-a</i>  | wash                                       |
| b. | <i>η-ól-a</i>   | drip (e.g. <i>ηáwá ηóla</i> ‘water drips’) |
| c. | <i>g-ʌηəf-ʌ</i> | show                                       |
| d. | <i>g-ákəm-a</i> | judge                                      |
| e. | <i>g-álab-a</i> | play                                       |

The patterns for tone distribution on the roots of proximal imperfective verbs are as follows. Less common forms are in parentheses.

## (17) H tone melodies on proximal imperfective verbs

Type of root		Long	Short
Light syllables	C-initial	HH-L	H-H
		(HL-L)	(H-L)
	V-initial	LH-L	L-L
		(HL-L)	(H-L)
Heavy syllables	C- or V-initial	HL-L	H-L

The tone patterns are therefore largely predictable in the proximal imperfective, being dependent on the syllable structure of the root (Jenks & Rose 2009, 2011). The verb root has a H tone on the first vowel of the verb root, unless the root is vowel-initial. This H tone never extends onto a second syllable if the first syllable is closed, but usually extends onto a second syllable if the first syllable is open. There are some exceptions to this pattern, but all involve a H tone on the first vowel that does not extend. The only forms that do not have H tone are short C- or VC roots. As a result of this largely predictable distribution, we refer to the tone pattern on proximal imperfective verbs as *default tone*. Since the general pattern is for verb roots



to have H tone and to locate it preferentially at the left edge, Jenks & Rose (2011) argue that the H tone is inserted, as in certain Bantu languages with predictable tone systems (Odden 1989). The lexical dimension of the system concerns not the appearance of H tone, but its ability either to extend, or to appear on a root-initial vowel.

In addition to the proximal imperfective, a number of other verb forms also employ default tone. These all appear in subordinate verb forms, which are marked by different prefixes than the imperfective and perfective forms discussed above. This sample shows the roots *ʃombəð* (HL pattern) ‘tickle’ and *ilíð* (LH pattern) ‘buy’ in 3SG. Unlike the proximal imperfective, there is no clause marker or class marker. Instead, an invariant subject marker appears (3SG is *áη-/áη-* or *áηá-*) which may be preceded by a complementizer *ná-*, *nə-* or *ʃ-*. The proximal/distal distinctions in these verb forms is the same as with the main imperfectives and imperatives, but the distinction is conveyed only through the final suffix, not tone patterns.

(18)		‘tickle’	‘buy’
	subordinate 1 proximal	(n)-áη- <sup>↓</sup> ʃómbəð-e	(n)-áη-ilíð-i
	subordinate 1 distal	(n)-áη- <sup>↓</sup> ʃómbəð-a	(n)-áη-ilíð-Λ
	subordinate 2 proximal	(n)-áη- <sup>↓</sup> ʃómbəð-a	(n)-áη-ilíð-Λ
	subordinate 2 distal	(n)-áη- <sup>↓</sup> ʃómbəð-ó	(n)-áη-ilíð-ú
	consecutive imperfective	ʃ-áη- <sup>↓</sup> ʃómbəð-ó	ʃ-áη-ilíð-ú
	consecutive proximal perfective	n-áηá- <sup>↓</sup> ʃómbəð-e	n-áη-ilíð-i
	consecutive distal perfective	n-áηá- <sup>↓</sup> ʃómbəð-a	n-áη-ilíð-Λ
	negative	g-an:á áη- <sup>↓</sup> ʃómbəð-a	g-an:á áη-ilíð-Λ
	negative imperative	án:á á- <sup>↓</sup> ʃómbəð-a	án:á í <sup>↓</sup> líð-Λ

Subordinate 1 verbs are used in future constructions following the verbs *ið* ‘make, do’ or *vəl/vəd* ‘go’, and as complements of certain verbs such as *boqη* ‘want’. They are marked with -e in the proximal, but with -a if a distal form is possible:

(19)	óráη	g-a-vəl-á	áη- <sup>↓</sup> áp-e	ηerá
	man	SM.CL-RTC-go-IPFV	3SG.SM-take-SUB1	child
	the man is going to hold the child			

Subordinate 2 verbs occur as complements of the verbs *indəʃfín* ‘try’ and *neð* ‘refuse’. The distal form ends in ó, but otherwise has the same tone pattern.<sup>6</sup>

<sup>6</sup> The exception to default tone in the subordinate forms are the 1PL.EXCL and the 3PL, which always have low toned roots.



proximal imperfective	(SM-)CL-	-a	default	<i>g-a-lávǎtf-a</i>
proximal imperative	—	-a	melodic L	<i>lǎvǎtf-a</i>
negative	SM	-a	default	<i>g-anǎ</i> <i>ǎŋ-<sup>l</sup>lávǎtf-a</i>
negative imperative	SM	-a	default	<i>ǎnǎ ǎ-<sup>l</sup>lávǎtf-a</i>
subordinate 2 proximal	( <i>nǎ-</i> ) SM	-a	default	<i>(n)-ǎŋ-<sup>l</sup>lávǎtf-a</i>
subordinate 1 distal	( <i>nǎ-</i> ) SM	-a	default	<i>(n)-ǎŋ-<sup>l</sup>lávǎtf-a</i>
consecutive distal perfective	<i>nǎ-</i> SM	-a	default	<i>n-ǎŋǎ-<sup>l</sup>lávǎtf-a</i>
subordinate 1 proximal	( <i>nǎ-</i> ) SM	-e	default	<i>(n)-ǎŋ-<sup>l</sup>lávǎtf-e</i>
consecutive proximal perfective	<i>nǎ-</i> SM	-e	default	<i>n-ǎŋǎ-<sup>l</sup>lávǎtf-e</i>

In conclusion, there is a wide array of aspect/mood/deixis constructions consisting of an AMD suffix in combination with i) a particular subject marking paradigm and ii) default tone or a specific melodic tone pattern. Melodic tone patterns occur with imperatives, perfective and distal imperfective. Default tone patterns occur with most dependent verb forms as well as the proximal imperfective.

#### 4. Macrostem prefixes

There are several prefixes that precede the verb root. We propose that they are divided into two groups, those that form part of a constituent we label the *macrostem*, demarcated by the left square bracket in (23) and those that precede it as part of a larger *verb stem* constituent. Evidence for this division is based on phonology.

- (23) COMP-SM-CLASS-CLAUSE-AMD- [OM/PROG-ITER-ROOT...  
[*macrostem*

##### 4.1 Progressive *v-*

Many vowel-initial roots have an extra prefix *v-* that only appears in the proximal imperfective. As reported in Jenks & Rose (2009), this prefix, which we label ‘progressive’ is restricted to appear i) only on vowel-initial roots and ii) only if the verb root contains no round vowel or labial

consonant. The *v*-prefix does not have a clear meaning in most cases, although its presence can sometimes distinguish the standard inceptive interpretation of the proximal imperfective from the progressive.

- |         |                     |           |    |                          |      |
|---------|---------------------|-----------|----|--------------------------|------|
| (24) a. | <i>g-a-v-áj-á</i>   | die       | e. | <i>g-Λ-v-álíð-Λ</i>      | buy  |
| b.      | <i>g-a-v-ár-á</i>   | cry       | f. | <i>g-Λ-v-Ágár-iə</i>     | read |
| c.      | <i>g-Λ-v-ád-iə</i>  | fall down | g. | <i>g-a-v-áláη-a</i>      | sing |
| d.      | <i>g-Λ-v-Ánd-iə</i> | catch     | h. | <i>g-a-v-ándətfín-iə</i> | try  |

Some roots require the *v*-prefix, whereas for others, it is optional: e.g. *g-Λ-v-Ág-iə* or *g-Λg-iə* ‘s/he is about to put’. When the *v*-prefix appears, the verbs resemble consonant-initial roots in terms of tone distribution: H tone appears on the first vowel of the root, and can extend to the right if on a light syllable. Jenks & Rose (2009) argue that the *v*-prefix licenses the default H tone appearing on the first vowel of the root as it provides an initial consonant within the macrostem.

#### 4.2 Durative/iterative

The durative/iterative prefix directly precedes the root, and conveys the meaning of repeated action or sustained action. It is a reduplicative prefix and takes the shape *Vk-* if it attaches to a vowel initial noun, where the *V* copies the first vowel of the root. Or, it takes the shape *CaC-* if it attaches to a consonant initial noun, where the *C* stands for copies of the first root consonant.<sup>7</sup> The addition of *CaC-* results in a geminate consonant with the root-initial consonant (we transcribe the geminates as two consonants here to show morpheme boundaries). The forms shown here are in the proximal imperfective:

- |      |                    |                         |       |
|------|--------------------|-------------------------|-------|
| (25) |                    | Durative/Iterative      |       |
| a.   | <i>g-ogət-ə</i>    | <i>g-ók:-ogət-a</i>     | jump  |
| b.   | <i>g-ál-a</i>      | <i>g-ák:-al-a</i>       | slice |
| c.   | <i>g-a-ðáw-á</i>   | <i>g-a-ðáð-ðəw-a</i>    | poke  |
| d.   | <i>g-a-váléð-a</i> | <i>g-a-váf-fərleð-a</i> | pull  |
| e.   | <i>g-a-távəð-a</i> | <i>g-a-ḏát-tavəð-a</i>  | spit  |

<sup>7</sup> Another method of marking the durative/iterative is through the infix *-r-*, which appears after the first vowel of the root. It can occur alone, typically with vowel-initial roots, or co-occur with the reduplicative prefix:

<i>ηodórəwa</i>	<i>ηidú</i>	the leaves fell	<i>ηodórəwa</i>	<i>ηirtú</i>	the leaves fell (rep.)
<i>gápa</i>		he is about to carry	<i>gárpa</i>		he is carrying
<i>ígílið-ú</i>		I bought it	<i>ígirliðú</i>		I bought (it) (rep.)

f.	<i>g-a-dárn-a</i>	<i>g-a-dát-tərn-a</i>	press
g.	<i>g-a-kʷərəð-a</i>	<i>g-a-gák-kʷərəð-a</i>	scratch
h.	<i>g-a-bár-á</i>	<i>g-a-báp-pər-a</i>	touch
i.	<i>g-ʌ-pʷəl-iə</i>	<i>g-ʌ-báp-pʷəl-iə</i>	hollow a hole

Voiced geminate obstruents that result from the prefixation are devoiced (except for *ð*:). When the root-initial consonant is voiceless (25e,g,i), voiceless dissimilation occurs and the first consonant of the prefix becomes voiced. Voiceless dissimilation is widespread in Moro and prevents two voiceless consonants co-occurring across an intervening vowel (Rose 2011). The geminate devoicing and voiceless dissimilation mean that the form of the prefix is always  $C_{[+voice]}aC_{[-voice]}$  regardless of the underlying voicing quality of the initial root.<sup>8</sup> The durative/iterative prefix is H toned in these forms, but the root is not. This pattern is true not just for the proximal imperfective, but indeed all forms that have *default tone*. Also note that vowel harmony affects the durative prefix, raising the vowel from *a* to *ʌ*, as in (25i). Finally, the progressive *v*-prefix precedes the durative prefix: *kʌ-v-ʌk-ʌnd-iə* ‘he is holding (durative)’.

Verb forms that have *melodic* tone apply the particular melodic tone pattern associated with that AMD form to the constituent consisting of root and prefix:

(26)	Perfective	[L]-ó	<i>g-a-[bap-pər]-ó</i>	he touched
	Distal imperfective	á-[L]-ó	<i>g-á-[bap-pər]-ó</i>	he is about to touch (there)
	Proximal imperative	[H]-ó	<i>[páp-pár]-ó</i>	touch!
	Distal imperative	[L]-a	<i>[pap-pər]-a</i>	touch! (there)

To summarize, both the *v*-prefix and the durative/iterative interact with the tone pattern applied to the verb stem. The *v*-prefix allows H tone to appear on vowel-initial roots in the proximal imperfective by serving as the initial consonant of the root. The durative/iterative adopts the tone pattern of the root depending on the aspect/mood/deixis form. For default tone, it is consistently H-toned, and H tone fails to appear on the verb root. Jenks & Rose (2011) analyze this distribution as the macrostem requiring a H tone at the left edge. Since the durative/iterative prefix is a closed syllable, H tone does not extend onto the next syllable. No H tone is needed on the verb root. In other words, default tone appears on the durative/iterative prefix. For

<sup>8</sup> This is true except in the imperative, where the initial obstruent of the durative/iterative is voiceless.

melodic tone verb forms, however, the durative/iterative prefix is either H or L depending on the particular tone requirements of each tone melody.

#### 4.3 Object marker

The next prefix to consider is the object marker. Object markers in Moro do not inflect for noun class, and cannot co-occur with an overt lexical object. As in related languages such as Tira and Otoro (Stevenson 1941/2009), object markers appear as either prefixes or suffixes, depending on the particular aspect/mood/deixis construction. Consider the contrast between the verb *g-a-ŋá-tfombəð-a* ‘s/he is about to tickle you’ and *g-a-tfombəð-á-ŋá* ‘s/he tickled you’. The object marker *ŋá* is the same in both verb forms; only its position differs. Prefixal object markers occur with the proximal imperfective and all the subordinate verb forms outlined in section 3 — in other words, precisely those verb forms that are marked with default tone. A list of object markers for the proximal imperfective is given below<sup>9</sup>:

(27) Proximal imperfective with objects

1SG	<i>g-a-ŋá-tfombəð-a</i>
2SG	<i>g-a-ŋá-tfombəð-a</i>
3SG	<i>g-a-ŋó-tfombəð-a</i>
1DU.INC	<i>g-á-ńdā-tfombəð-a</i>
1PL.INC	<i>g-á-ńdā-tfombəð-a-r</i>
1PL.EXC	<i>g-a-ŋá-tfombəð-á-lánda</i>
2PL	<i>g-á-ńdā-tfombəð-a</i>
3PL	<i>g-a-tfómbəð-a-lo</i>

When the object prefix appears before the root, the H tone that normally appears on the root (*g-a-tfómbəð-a* ‘s/he is about to tickle’) is absent. The 3<sup>rd</sup> plural is the exception to the prefix pattern. Its object marker consistently appears as a suffix in all verb forms, and the H tone appears on the verb root.

In two forms, the 1PL.EXC and the 1PL.INC, an additional suffix is also observed. The suffix *-lánda* distinguishes the 1SG object from the 1PL.EXC object. The *-r* is a plural marker also used to distinguish 1PL.INC subject from 1DU.INC subject, and to distinguish the 2SG from the 2PL imperative, see (28):

<sup>9</sup> It is not easy to tell if the 1PL.EXC is *-álánda* or *-lánda*. Data from the position of the plural marker *-r* (section 6.1) suggests the later. Thanks to Angelo Naser for comments on this point.

(28)	1DU.INC	<i>álá-tfombəð-a</i>	we two are about to tickle
	1PL.INC	<i>álá-tfombəð-a-r</i>	we all are about to tickle
	2SG PROX.IMP	<i>tfómbəð-ó</i>	tickle!
	2PL PROX.IMP	<i>tfómbəð-ó-r</i>	tickle! (pl.)

If there is more than one object marker, only one can appear as a prefix, and the other must appear as a suffix. See Rose & Jenks (2011) for more details.

The object prefixes appear before the durative/iterative prefix, and cannot co-occur with the progressive *v*-prefix. This latter restriction is morphophonological rather than semantic, as *v*- can co-occur with the 3PL *-lo* object marker: *g-á-n-and-iə* ‘he is about to hold me’ versus *g-á-v-ánd-iə-lo* ‘he is about to hold them’. The H tone from the object prefix shifts to the previous vowel.

The H tone which normally appears on the root or on the durative/iterative prefix is absent when an object prefix is present. Rose & Jenks (2011) argue that the H tone of the object marker functions as the default tone of the verb stem, obviating the need to position a H tone on the verb root. Another possible analysis is to treat this as a type of tone dissimilation effect, in which only a single H tone is allowed at the left edge of the macrostem. Finally, like the durative/iterative prefix, vowel harmony can affect the object prefix: e.g. *g-á-ŋá-dər-iə* ‘he is about to cover you’.

To summarize, the durative/iterative prefix, the progressive prefix, and the object marker all affect the distribution of default H tone. The leftmost element in the macrostem bears H tone, and the other elements do not. We now turn to the other prefixes in the verb stem, many of which have H tone that co-occurs with default H tone. We maintain that this constitutes evidence for the macrostem boundary.

## 5. Verb stem prefixes

The prefixes that occur to the left of the macrostem boundary are as follows<sup>10</sup>.

<sup>10</sup> It is possible that there is also a tense prefix developing in the language. For example, the form *á-gá-g-a-təŋat-ó* ‘you had licked it’ suggests a reduplicative prefix *gá-* with H tone that copies the elements to its right. However, this ‘prefix’ appears to be the fusion of the verb ‘to be’ with a following verb with the same subject, clause and aspect marking, giving the appearance of reduplication: *á-g-a(w)-ó á-g-a-təŋat-ó* → *ágága-təŋat-ó*. There is no vowel harmony between the two, an indication of separate words: *né-n-i-*

(29) COMP-SM-CLASS-CLAUSE-AMD-[OM/PROG-ITER-ROOT...]

Starting from the macrostem boundary, we have already discussed the distal imperfective prefix *á-* in section 2.3 that appears before the basic verb stem. Since it appears only with melodic tone, its effect on default tone cannot be determined, and we do not discuss it further.

### 5.1 Clause markers

There are three basic clause markers that Moro employs in a variety of constructions: *a-*, *é-*, *á-*. They all appear following the class marker and preceding the macrostem, and can be raised by vowel harmony.

The finite root clause marker *a-* appears on the verb in basic main clause forms (30a-b) as well as in some subordinate clauses introduced by verbs such as *lənɛt* ‘know’ or *aɬ* ‘say/think’ (30b). We gloss this vowel as ‘root clause’ (RTC):

- (30) a. *um:iə* *g-a-land-ó* *ɬurí*  
 boy SM.CL-RTC-close-PFV door  
 the boy closed the door
- b. *mama* *g-a-v-áɬ-á* *um:iə* *g-a-ker-ó* *gəla*  
 mama SM.CL-RTC-PROG-think-IPFV boy SM.CL-RTC-broke-PFV plate  
 Mama thinks the boy broke the plate

The clause marker *é-* is used in some subordinate constructions that are complements of main verbs of perception such as *n-* ‘hear’ or *wəndaɬ* ‘watch, see’ (31a), as well as in subject clefts, relative clauses and content cleft questions (31b). This *é-* does not co-occur with a complementizer. We gloss it here as Dependent Clause 1 (DC1).

- (31) a. *ɲálo* *g-a-wəndaɬ-ó* *kúku-ɲ* *g-é-m-ó* *ów:á*  
 Ngalo SM.CL-RTC-watch-PFV Kuku-OC SM.CL-DPC1-take-PFV woman  
 Ngalo watched Kuku marry the woman
- b. *ɲwáɬɬáki* *g-é-m-ó* *ów:á* *k-oal-á*  
 who SM.CL-DPC1-take-PFV woman SM.CL-tall-ADJ  
 Who married the tall woman?

---

*sɛtf-ú* ‘that I had seen’ We therefore leave aside further discussion of a possible tense prefix in this paper.



The clause marker *ǎ-* appears in some subordinate constructions as the complement of verbs such as *mwandǎǎ* ‘ask’ and *lugǎ* ‘tell’ (32a) as well as with non-subject clefts, relative clauses, and content cleft questions (32b). We gloss it here as Dependent Clause 2 (DC2).

- (32) a. *é-g-a-m<sup>w</sup>andǎǎ-ó-ŋó*                      *tá*                      *g-ǎ-<sup>l</sup>nátf-a-lo*  
 1SG.SM-CL-RTC-ask-PFV-3SG.OM    COMP    SM.CL-DPC2-give-IPFV-3PL.OM  
*utǎrǎ*  
 pig  
 I asked him to give them a pig
- b. *ŋwǎndǎk:i*                      *(n-)úǎí*                      *(ná-)g-ǎ-wǎndǎt-ó*  
 CLEFT.what                      (COMP-)man                      (COMP-)SM.CL-DPC2-watch-PFV  
 What did the man watch?

The clause marker *ǎ-* does not appear with 1<sup>st</sup> and 2<sup>nd</sup> persons. These forms also lack the class marker *g-* which typically precedes the clause marker, so the main verb form is distinguished from the dependent clause by the lack of these markers. Compare the main form *é-g-a-wǎndǎt-ó* ‘I watched it’ with the alternate clause form: *ŋínǎ-ŋ:i é-wǎndǎt-ó* ‘the dog that I watched’.

With respect to tone interaction, the prefixes *é-* and *ǎ-* co-occur with default tone of the macrostem. This is seen with example (33), in which the *é-* appears adjacent to the H tone at the left edge of the macrostem. In this example, the prefix triggers downstep on the verb root H tone in (33a) or the durative H-toned prefix in (33b):

- (33) a. *ŋerá ŋ-é-<sup>l</sup>ǎw-á*                      the girl who is about to poke  
 b. *ŋerá ŋ-é-<sup>l</sup>ǎǎǎ-ǎw-a*                      the girl who is about to poke repetitively

This type of tone interaction is markedly different from that between the durative/iterative prefix and root tone within the macrostem. In that case, only one H tone can appear, and it appears on the leftmost element. The H tone of the clause marker, on the other hand, co-occurs with H tone on the macrostem. Downstep is an indication of two separate H tones (Odden 1982) and the fact that it occurs only when these particular affixes are juxtaposed, but not others, indicates a boundary. We therefore conclude that downstep marks the left edge of the macrostem.<sup>11</sup>

<sup>11</sup> We have no evidence to postulate a floating L tone to mark downstep, so we assume that two separate H tones across a boundary is sufficient.

## 5.2 Class marker

The class marker is always a single consonant from the set  $\delta$ -,  $g$ -,  $l$ -,  $r$ -,  $j$ -,  $n$ -,  $\eta$ -,  $n$ - and it varies depending on the noun class of the subject. There are a number of different noun classes in Moro, as documented in Black & Black (1971) and for Thetogovela Moro in Gibbard et al (2009). As mentioned above, the default class marker  $g$ - that appears in finite 1<sup>st</sup> and 2<sup>nd</sup> person root clause forms does not appear in the verb forms of dependent clause 2 forms (those marked with  $\delta$  in 3rd person).

## 5.3 Subject markers

There are three basic paradigms of subject markers, and they appear as prefixes on the verb. They are positioned before the class marker and clause marker, if these are present. Otherwise, they directly abut the macrostem.

In root clauses, the subject marking paradigm is given below. The final aspect/mood vowel is either  $\delta$ - (perfective, distal imperfective) or  $a$ - (proximal imperfective), and the root bears H tone according to the type of root and AMD construction. The root is preceded by the clause marker  $a$ - and the default class marker  $g$ - in 1<sup>st</sup> and 2<sup>nd</sup> persons, or by a noun class agreement marker in 3<sup>rd</sup> persons. As noted above, in clauses marked with  $\delta$ -, the paradigm is similar, but with non-3<sup>rd</sup> persons the  $g$ - and clause marker are absent. Vowel harmony extends from the root to the subject markers, raising  $e$   $a$  to  $i$   $\wedge$  respectively, e.g.  $\acute{i}$ - $g$ - $\acute{u}l\acute{i}\delta$ - $\acute{u}$  'I bought it' or  $n\acute{u}$ - $g$ - $\acute{u}l\acute{i}\delta$ - $\acute{u}$  'we (not you) bought it'.

(34)

PERSON/ NUMBER	SUBJECT MARKER	FINITE VERB, PROXIMAL IMPERFECTIVE	DEPENDENT $\delta$ -CLAUSE, PROXIMAL IMPERFECTIVE
1SG	$\acute{e}$ -	$\acute{e}$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$n$ - $\acute{e}$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
2SG	$\acute{a}$ -	$\acute{a}$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$n$ - $\acute{a}$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
3SG	CL-	$g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$(n\acute{a})$ - $g$ - $\delta$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
1DU.INC	$\acute{a}l(\acute{a})$ -	$\acute{a}l(\acute{a})$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$n$ - $\acute{a}l(\acute{a})$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
1PL.INC	$\acute{a}l(\acute{a})$ - $r$	$\acute{a}l(\acute{a})$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$ - $r$	$n$ - $\acute{a}l(\acute{a})$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$ - $r$
1PL.EXC	$n\acute{a}$ -	$n\acute{a}$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$n\acute{a}$ - $n\acute{a}$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
2PL	$n\acute{a}$ -	$n\acute{a}$ - $g$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$n\acute{a}$ - $n\acute{a}$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$
3PL	CL-	$l$ - $a$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$	$l$ - $\delta$ - $\acute{t}\acute{o}mb\acute{a}\delta$ - $a$

The H-toned subject markers co-occur with default H tone on the root, and are usually separated from it by the clause marker. However, with vowel-

initial roots with initial H tone, in which the clause marker is deleted due to hiatus, or with 1<sup>st</sup> and 2<sup>nd</sup> person dependent clause constructions in which class marker and clause marker are absent, downstep is observed: *é-<sup>l</sup>g-áfí-a* ‘s/he is about to shoot/build’. Therefore, the downstep already observed between some clause markers and default tone also occurs between H-toned subject markers and default tone. Note that the default tone does not appear in 1PL.EXC and 3PL forms of the dependent clause. The lack of default H tone in these forms is also observed in the subordinate constructions discussed below.

In subordinate forms, the subject marking paradigm is different, both in the segmental and tonal form of the markers, but also the tone patterns of the paradigm. First, the subject markers that are segmentally identical to the subject markers in the other patterns in (34) do not have H tone. Second, the 3<sup>rd</sup> person subject markers are invariable and do not indicate noun class. The 3SG subordinate form is *áfí(ǎ)-* and the consecutive is *ǎí(ǎ)-*. Third, the tone on the verb stem is default tone in all persons except the 1PL.EXCL and 3PL forms, which lack default H tone.

(35)

PERSON/NUMBER	SM	SUBORDINATE	CONSECUTIVE
1SG	<i>e-</i>	<i>e-tfómbəð-a</i>	<i>e-tfómbəð-a</i>
2SG	<i>a-</i>	<i>a-tfómbəð-a</i>	<i>a-tfómbəð-a</i>
3SG	<i>áfí(ǎ)-/ǎí(ǎ)-</i>	<i>áfí(ǎ)-<sup>l</sup>tfómbəð-a</i>	<i>ǎí(ǎ)-<sup>l</sup>tfómbəð-a</i>
1DU.INC	<i>al(ǎ)-</i>	<i>al(ǎ)-tfómbəð-a</i>	<i>al(ǎ)-tfómbəð-a</i>
1PL.INC	<i>al(ǎ)- -r</i>	<i>al(ǎ)-tfómbəð-a-r</i>	<i>al(ǎ)-tfómbəð-a-r</i>
1PL.EXC	<i>ja-</i>	<i>ja-tfómbəð-a</i>	<i>ja-tfómbəð-a</i>
2PL	<i>ja-</i>	<i>ja-tfómbəð-a</i>	<i>ja-tfómbəð-a</i>
3PL	<i>alǎ-/lǎ-</i>	<i>alǎ-tfómbəð-a</i>	<i>alǎ-tfómbəð-a</i>

The complementizers that accompany the subordinate or consecutive can add a H tone onto the subject markers.

#### 5.4 Complementizers

There are three complementizers that attach at the left edge of the verb stem: *nǎ-*, *nǎ-* and *tǎ-*. The complementizer *nǎ-* occurs on subordinate forms and on non-subject relative clauses, clefts and wh-questions, while the other two are restricted to the consecutive, *nǎ-* occurring on the perfective and *tǎ-* on the imperfective:

- (36) a. *ná-g-ɬ-tf-ánó* *nə-na-tað-e-lo*  
 1PL.EXC.SM-CL-RTC-get\_mad-PART COMP-1PL.EXC.SM-leave-  
 -CONS.PFV-3PL.OM  
 we (not you) got mad and left them
- b. *ná-g-a-kəl-ó* *eréð* *tə-na-wat-ó*  
 1PL.EXC.SM-CL-RTC-cut- PFV cloth COMP-1PL.EXC.SM-sew-CONS.IPFV  
 we (not you) cut the cloth and we are about to sew it

The H tone of the complementizer appears on the first vowel of the subject marker if vowel-initial. Complementizers also co-occur with H tone of the other verb stem prefixes, and fail to trigger downstep, except when their H tone ends up on a prefix that is adjacent to default H tone in the macrostem.

### 5.5 Summary

The behavior of the prefixes shows a clear division between those closest to the verb root within the macrostem and those outside the macrostem. The leftmost macrostem prefix hosts default H tone. This tone can be inserted or, in the case, of object prefixes, underlying. Some of the verb stem prefixes have underlying H tone, and they trigger downstep at the macrostem boundary, but they do not show tone interaction with each other. The tonal behavior motivates a morphophonological boundary between macrostem and non-macrostem prefixes. Vowel harmony crosses this domain, and all prefixes undergo vowel harmony.

We now turn to the suffixes that appear following the root. We divide these into three groups. First are the ‘extension’ suffixes, which are part of the macrostem. Second, the aspect/mood vowel, discussed in sections 2 and 3, is added to the macrostem, and along with the non-macrostem prefixes, forms the *verb stem*. Third is a series of clitics that attach following the AMD vowel. These include object markers and instrumental and locative clitics.

## 6. Extension suffixes

Moro has a series of extension suffixes that appear following the verb root and before the final aspect/mood vowel, in the following basic order:

- (37) ROOT-AP-LOC.APPL-CAUS-APPL-PASS

These markers are the anti-passive/reciprocal/distributive *-əð*, the locative applicative *-at*, the causative *-i*, the benefactive applicative *-ət* and the

passive/reflexive *-ən*. Some representative verb forms of the verb for *kəv* ‘pinch’ are given below, drawn from Strabone & Rose (to appear).

(38)	PERFECTIVE	PROXIMAL IMPERATIVE	PROXIMAL IMPERFECTIVE
	<i>g-a-kəw-ó</i>	<i>kəw-ó</i>	<i>g-a-kəv-á</i>
anti-passive/reciprocal	<i>g-a-kəv-əð-ó</i>	<i>kəv-əð-ó</i>	<i>g-a-kəv-əð-eə</i>
locative applicative	<i>g-a-kəv-aɬ-ó</i>	<i>kəv-aɬ-ó</i>	<i>g-a-kəv-aɬ-a</i>
causative	<i>g-ʌ-kəv-í</i>	<i>kəv-í</i>	<i>g-ʌ-kəv-iə</i>
benefactive applicative	<i>g-ʌ-kəv-əɬ-ú</i>	<i>kəv-əɬ-ú</i>	<i>g-ʌ-kəv-əɬ-iə</i>
passive/ reflexive	<i>g-ʌ-kəv-ən-ú</i>	<i>kəv-ən-ú</i>	<i>g-ʌ-kəv-ən-iə</i>

There are several points of note. First, each of the suffixes appears before the final aspect/mood vowel, except for the causative, which combines with or replaces the final aspect mood vowel. This is expected, as it is the only suffix that is composed of a single vowel. Second, the causative, benefactive applicative and passive/reflexive all trigger vowel harmony, raising the root and prefix vowels as well as the final aspect/mood vowel. Third, the tone pattern of the basic stem applies to the forms with extension affixes, too. Setting aside the causative, the other affixes are low-toned in the perfective, high-toned in the imperative, and default tone is found in the proximal imperfective. Since the root shown is a CVC root with H tone extension, H tone appears on the following extension suffix, but not the final AMD vowel. We now turn to each suffix and give examples.

#### 6.1 The anti-passive/reciprocal/distributive suffix *-əð*

The suffix *-əð* has a variety of meanings. It can indicate a missing human object argument, a type of anti-passive. Consider the following set of sentences:

- (39) a. *é-g-ákəm-a-lo* I am judging them  
 b. *é-g-ákəm-a udzɪ* I am judging the man  
 c. *é-g-ákəm-əð-eə* I am judging (= I am judging someone)  
 d. *é-g-a-m:-ó kodza-ŋ* I married Koja  
 e. *é-g-a-m:-əð-ó* I got married (= *lit.* I took someone)  
 f. *k-a-ðəw-á iriə* s/he is about to poke cows  
 g. *k-a-ðəw-əð-ea* s/he gives injections (= *lit.* poke people)

If the object is overtly expressed, either as an object marker or a lexical noun phrase, then the *-əð* cannot occur, as seen in (39a,b,d,f). The suffix *-əð* does not trigger vowel harmony, but causes diphthongization of the final vowel

suffix *-a* to *-eə*, which could indicate the suffix is actually *-əðe*. If the final vowel suffix is *-ó* or *-é*, however, no diphthongization is observed.

With ditransitives, *-əð* co-occurs with the direct object and indicates the absence of the indirect object, the unspecified human recipient of the action, hence the term anti-passive.

- (40) a. *k-a-nátj-a udzǐ áḍámá* s/he is about to give the man a book  
 b. *kúku g-a-nátj-əð-eə wánde?* what is Kuku about to give?  
 c. *k-a-nátj-əð-eə áḍámá* s/he is about to give a book (to s.o.)

Another meaning of this marker is reciprocal:

- (41) a. *l-a-noán-a ɲerá* they are tending to the child  
 b. *l-a-noán-əð-eə* they are tending to each other

Finally, it may also have a distributive reading if the lexical object is overtly expressed.

## 6.2 The locative applicative *-at*

The locative applicative is *-at*. It does not trigger any phonological processes on the verb stem, other than the [a] can be optionally dropped following sonorants. The locative applicative co-occurs with an overt locative expression such as a locative-marked noun (with prefix *n-* or *é(k)-*) as in (42b,c) or a postpositional phrase, and it can also co-occur with the locative clitic *-u* as in (42d), to be discussed in section 5.2. In (42e,f), the distinction between the locative applicative and the benefactive applicative is clearly demonstrated, with the locative marker displaying a malfactive reading.

- (42) a. *k-a-kál-á rḍa* s/he is cutting the meat  
 b. *k-a-kál-at-a rḍa ík-wǐjál* s/he is cutting the meat on the floor  
 c. *k-a-bəḍ<sup>w</sup>-at-a n-aletə* s/he is about to climb over the wall  
 d. *k-a-bəḍ<sup>w</sup>-at-ɬ-u* s/he is about to climb up it  
 e. *é-g-a-mi-at-ó ɲerá áḍámá* I took the book from the girl  
 f. *í-g-ɬ-mi-at-ú ɲerá áḍámá* I took the book for the girl

The locative applicative cannot co-occur with the benefactive applicative (43c).

- (43) a. *é-g-ab-at-ó áḍámá é-lná* I carried the book into the room  
 b. *í-g-ɬb-at-ú ɲerá áḍámá* I carried the book for the girl  
 c. *í-g-ɬb-it-ú ɲerá áḍámá é-lná* I carried the book for the girl into the room

## 6.3 The causative suffix -i

As noted above, the causative vowel combines with the final aspect/mood vowel rather than preceding it if there are no additional extension suffixes intervening. In addition, the causative imposes a particular tone pattern that the other extension suffixes do not. As discussed in Strabone & Rose (to appear), the causative requires a H tone on the preceding stem in default tone constructions, and allows no H tone on the causative marker. For long verbs, this does not alter the basic tone pattern, but for short verbs, it does, as shown below:

(44)	ROOT SHAPE	TONE	PROXIMAL IMPERFECTIVE	TONE	CAUSATIVE PROXIMAL IMPERFECTIVE	
a.	CVC	H-H	<i>g-a-ðáw-á</i> <i>g-a-lág-á</i>	H-L	<i>g-Λ-ðáw-iə</i> <i>g-Λ-lág-iə</i>	poke weed
b.	C:	L-L	<i>g-a-s:-a</i>	H-L	<i>g-Á-s:-iə</i>	eat
c.	VC	L-L	<i>g-al-a</i> <i>g-oað-a</i>	H-L	<i>g-Ál-iə</i> <i>g-uÁð-iə</i>	slice mill, grind

The tone pattern in the causative consists of L tone on the causative proximal imperfective suffix, and a preceding H tone on the root or the clause marker preceding it, if there is no root vowel.

Vowel harmony is observed with the causative, and it also triggers palatalization of a preceding dental stop. In these examples, the melodic tone pattern is carried over to the causative.

(45)	PERFECTIVE	CAUSATIVE PERFECTIVE	
a.	<i>g-a-təŋat-ó</i>	<i>g-Λ-təŋatf-í</i>	lick
b.	<i>g-a-dogat-ó</i>	<i>g-Λ-dugatf-í</i>	repair
c.	<i>g-a-rəm<sup>w</sup>ət-ó</i>	<i>g-Λ-rəm<sup>w</sup>ət<sup>w</sup>f-í</i>	take care of
d.	<i>g-ogət-ó</i>	<i>g-ugət<sup>w</sup>f-í</i>	jump
e.	<i>g-a-land-ó</i>	<i>g-Λ-land<sup>w</sup>-í</i>	close

The causative follows the anti-passive/reciprocal/distributive and the locative applicative marker, as seen in the following examples. The causative combines with the final aspect/mood vowel, raises vowels and causes palatalization of the dental stop of the locative applicative in (46b). This example also shows that the AP suffix -əð precedes the locative applicative.

- (46) a. *k-Λ-məg-əð-iə lidzí*  
s/he is putting a curse on the people
- b. *k-Λ-məg-əð-Atf-iə ów:á lidzí é-lná*  
s/he is putting a curse on the people in the room

6.4 The (benefactive) applicative suffix  $-\text{ə}\text{t}$ 

The applicative is usually interpreted as benefactive:

- (47) a. *k-a-dáŋ-á í-ðádí* s/he is sitting/waiting in the crevice  
 b. *k-a-dáŋ-á-t-ia ɲerá í-ðádí* s/he is sitting/waiting for the girl in the crevice

The applicative suffix causes vowel raising of the root and preceding prefixes, as well as raising of the final aspect/mood vowel. It also triggers palatalization of a preceding dental stop, and the palatal consonant fronts the suffix vowel to [i]. The voiceless dental stop of the applicative suffix triggers voiceless dissimilation on the preceding voiceless dental stop.

- |      |                                  |                                      |              |
|------|----------------------------------|--------------------------------------|--------------|
| (48) | PERFECTIVE                       | APPLICATIVE PERFECTIVE               |              |
| a.   | <i>g-a-təŋa-t-ó</i>              | <i>g-a-təŋa-t-ə-t-ú</i>              | lick         |
| b.   | <i>g-a-doga-t-ó</i>              | <i>g-a-duga-t-ə-t-ú</i>              | repair       |
| c.   | <i>g-a-rəm<sup>w</sup>-ə-t-ó</i> | <i>g-a-rəm<sup>w</sup>-ə-t-ə-t-ú</i> | take care of |
| d.   | <i>g-ogə-t-ó</i>                 | <i>g-ugə-t-ə-t-ú</i>                 | jump         |
| e.   | <i>g-a-land-ó</i>                | <i>g-a-lan-t-ə-t-ú</i>               | close        |

Vowel raising and palatalization suggest that the suffix was originally  $-\text{it}$ , but vowel reduction has caused a change to  $-\text{ət}$ .

The applicative can also be used as a comparative (Gibbard, Kertz & Simons 2010).

- (49) *kúku g-a-si-ə-t-ú ome máŋga ramram*  
 Kuku SM.CL-RTC-eat-APPL-PFV fish mango quickly  
 Kuku ate the fish more quickly than (he ate) the mango

The locative applicative and the benefactive applicative do not co-occur. Their different locations with respect to the causative can be observed in the following sentences. In the first case, the causative raises the vowels and triggers palatalization of the  $t$  of the locative applicative suffix. In the second case, the causative precedes the benefactive applicative, so no palatalization is observed.

- (50) a. *ów:á g-ubəð-ət-í ɲíní é-ŋəbórɔ*  
 woman SM.CL-run-LOC.APPL-CAUS.PFV dog LOC-yard  
 the woman made the dog run in the yard
- b. *ów:á g-ubəð-i-t-ə-lo ɲíní*  
 woman SM.CL-run-CAUS-APPL-PFV-3PL.OM dog  
 the woman made the dog run away from them



## 6.5 The passive/reflexive suffix -ən

The passive/reflexive suffix is ordered after the applicative. Phonologically, the passive/reflexive behaves like the applicative suffix -ət in that it triggers vowel raising and palatalization of a preceding dental stop. The ə of the suffix is fronted to i after a palatal consonant.

(51)	PERFECTIVE	PASSIVE PERFECTIVE	
a.	<i>g-a-təŋat-ó</i>	<i>g-a-təŋaɕ-ən-ú</i>	lick
b.	<i>g-a-dogat-ó</i>	<i>g-a-dugaɕ-ən-ú</i>	repair
c.	<i>g-a-rəm<sup>w</sup>ət-ó</i>	<i>g-a-rəm<sup>w</sup>əɕ-ən-ú</i>	take care of
d.	<i>g-ogət-ó</i>	<i>g-ugəɕ-ən-ú</i>	jump
e.	<i>g-a-land-ó</i>	<i>g-a-lanɕ-ən-ú</i>	close

This suffix has a reflexive reading when used as follows:

(52)	a.	<i>k-a-təŋat-ó logopájá</i>	s/he licked the cup
	b.	<i>k-a-təŋatf-ən-ú ɣɿ<sup>w</sup>ɿ</i>	s/he licked his lips/mouth
	c.	<i>k-a-təŋatf-ən-ú</i>	s/he licked herself/himself

The passive is ordered after the causative and applicative:

(53)	a.	<i>ɿní ɿ-ubəð-ət-f-i-n-ú</i>	<i>é-ŋəbórtó</i>
		dog SM.CL-run-LOC.APPL-CAUS-PASS-PFV	LOC-yard
		the dog was made to run in the yard	
	b.	<i>ow:a g-ubəð-i-tf-ən-ə-ŋó</i>	
		woman SM.CL-run-CAUS-APPL-PASS-PFV-3SG.OM	
		the woman was made to run away from him	

When the passive suffix is attached to V-initial roots, it does not bear H tone with long roots, but does have a H tone with short roots, even though the initial vowel still lacks H tone. The same pattern is also found for the other -VC extension suffixes.

(54)		IMPERFECTIVE	IMPERFECTIVE PASSIVE	
	H-H	a. <i>g-a-boáŋ-a</i>	<i>g-a-buáŋ-án-iə</i>	like, want
		b. <i>g-a-wáð-a</i>	<i>g-a-wáð-ən-iə</i>	poke
	H-L	c. <i>g-a-váð-a</i>	<i>g-a-váð-ən-iə</i>	shave
		d. <i>g-a-tóð-a</i>	<i>g-a-túð-ən-iə</i>	move
		e. <i>g-al-a</i>	<i>g-al-ən-iə</i>	slice
		f. <i>g-oað-a</i>	<i>g-uað-ən-iə</i>	mill, grind

The extension markers, with the exception of the causative, can bear default H tone extended from a short vowel root. The extension markers also participate in vowel harmony. The locative applicative marker can be raised,

and the causative, passive and benefactive applicative trigger vowel harmony. Due to their tight phonological interaction with the root, we consider the extension markers to be part of the macrostem.

Is the aspect/mood/deixis vowel that follows the extension markers also part of the macrostem? We propose that it is not for two reasons. First, downstep occurs between default tone in the macrostem and a high-toned AMD suffix. Second, the AMD constructions assign either melodic tone or default tone to the macrostem, but this is independent from the tone of the actual AMD suffix. We therefore propose that the right edge of the macrostem boundary is located after the final extension suffix and before the AMD suffix:

- (55) ... [OM/PROG-ITER-ROOT-AP-LOC.APPL-CAUS-APPL-PASS ]-AMD  
[*macrostem* ]

There may be additional evidence for another domain internal to the verb stem, the *inflectional stem*, which consists of the macrostem and the AMD affixes, but we do not pursue these arguments here. See Rose & Jenks (2011).

## 7. Clitics

The clitic group is attached following the verb stem, and consists of four basic markers: the object marker, the plural, the locative and the instrumental.

### 7.1 Object marker and plural -r

As discussed in section 4.3, object markers occur primarily as prefixes with verb forms that have default tone. Verb forms with melodic tone consistently have object marker enclitics as shown below for the perfective form of *g-a-tfombəð-ó* ‘s/he tickled’. The final -ó is altered to [á] or [ó] depending on the following vowel.

- |      |         |                                     |
|------|---------|-------------------------------------|
| (56) | 1SG     | <i>g-a-tfombəð-ó = <b>ɲé</b></i>    |
|      | 2SG     | <i>g-a-tfombəð-á = <b>ɲá</b></i>    |
|      | 3SG     | <i>g-a-tfombəð-ó = <b>ɲó</b></i>    |
|      | 1DU.INC | <i>g-a-tfombəð-ó = <b>ńda</b></i>   |
|      | 1PL.INC | <i>g-a-tfombəð-ó = <b>ńd-r</b></i>  |
|      | 1PL.EXC | <i>g-a-tfombəð-á = <b>lánda</b></i> |
|      | 2PL     | <i>g-a-tfombəð-ó = <b>ńda</b></i>   |
|      | 3PL     | <i>g-a-tfombəð-ó = <b>lo</b></i>    |

The other melodic tone forms are similar:

- (57) with 3SG object
- |    |                     |                           |
|----|---------------------|---------------------------|
| a. | distal imperfective | <i>g-á-tfombəð-ó = ηó</i> |
| b. | proximal imperative | <i>tfómbəð-ó = ηó</i>     |
| c. | distal imperative   | <i>tfombəð-á = ηó</i>     |

The object markers that appear as these enclitics do not interact with the H tone of the macrostem. H tone appears normally on the verb stem in the forms that require it, and there is no downstep. In addition, there is vowel harmony evidence that these markers are not as fully incorporated phonologically as the prefixes and the AMD suffix, as they do not undergo vowel harmony. The AMD suffixes are raised by vowel harmony, as are all preceding prefixes, including the object marker (58f):

- (58)
- |    |                                   |                             |
|----|-----------------------------------|-----------------------------|
| a. | <i>é-g-a-veð-ó</i>                | I slapped (sthg)            |
| b. | <i>é-g-a-veð-á</i>                | I am about to slap (sthg)   |
| c. | <i>é-g-a-ηá-veð-a</i>             | I am about to slap you      |
| d. | <i>í-g-λ-bug-ú</i>                | I hit (sthg)                |
| e. | <i>í-g-λ-búg<sup>w</sup>-λ</i>    | I am about to hit (sthg)    |
| f. | <i>í-g-λ-ηλ-bug<sup>w</sup>-λ</i> | I am about to hit you (sg.) |

However, clitics following the aspect/mood/deixis suffixes are not generally affected by vowel harmony:

- (59)
- |    |                         |               |
|----|-------------------------|---------------|
| a. | <i>é-g-a-veð-á = ηá</i> | I slapped you |
| b. | <i>í-g-λ-bug-ú = ηá</i> | I hit you     |

Object enclitics, unlike object prefixes, also fail to interact tonally with the rest of the verb stem. Coupled with the vowel harmony evidence, this indicates a morpho-phonological boundary between the AMD suffix and the object markers. The phonological evidence, coupled with the fact that the object markers cannot co-occur with lexical noun phrases indicates that they are clitics.

Recall from section 4.3 that the plural marker *-r* combines with the subject marker for 1DU.INC to indicate the 1PL.INC subject. The *-r* in this use follows the AMD suffix and precedes other object suffixes (60a,b). However, it also combines with the 1DU.INC *-nd-* object marker to create the 1PL.INC object (60c). It always appears as a suffix, directly following the *nd* component if the latter is a suffix, otherwise, in the standard position following the AMD suffix, and preceding other object suffixes (60c).

The instrumental clitic *-ja* appears following the verb stem, and after the object marker clitics. Like the object markers, the instrumental clitic cannot co-occur with an overt instrumentally-marked noun phrase. Although the instrumental suffix that appears on nouns is inflected for noun class, the instrumental clitic that appears on verbs is not.

- The *-ja* is low-toned itself but its attachment triggers a H tone on the preceding vowel.

The locative clitic *-u* appears at the end of the verb stem, following the object clitics and the instrumental. It does not co-occur with a locative-marked noun or a postpositional phrase (62a,b). Like the instrumental clitic, the locative clitic triggers a H tone on the preceding vowel.

- (62) a. *é-g-a-vádað-a*                      *ŋará é-ina*  
 1SG.SM-CL-RTC-sweep-IPFV trash LOC-room  
 I am sweeping trash from the room

- b. *é-g-a-vádað-á=u*                      *ɲará*  
 1SG.SM-CL-RTC-sweep-IPFV-LOC    trash  
 I am sweeping trash from it (i.e. the room)
- c. *k-a-vádað-á=já=u*  
 SM.CL-RTC-sweep-IPFV-INST-LOC  
 he is sweeping with it from it

Like the object marker clitics that precede them, these clitics do not participate in vowel harmony, except in a local fashion, for example, the sequence *á=u* is realized *áu*. The clitic sequence also manifests its own tone pattern: there is a H tone at the left edge and L tone at the end of the clitic group. The L tone requirement forces realization of the H tone onto the preceding vowel. If there is only one H toned object marker clitic, then the H tone is maintained, suppressing the L tone, but if there are two, the second object marker is low-toned: *g-a-naɲf-á-ɲó* 's/he gave it to him' versus *g-a-naɲf-á-ńda-ɲo* 'he gave him to us'.

## 8. Conclusion

In this article, the basic structure of the verb in the Thetogovela dialect of Moro is presented. Moro has a large series of prefixes and suffixes, but these can be divided into three distinct domains. The macrostem consists of the root and several prefixes and suffixes, including an object marker. It is characterized by a single H tone at the left edge when there are no specific tonal melodies required by the aspect/mood/deixis system. The larger verb stem includes the aspect/mood/deixis suffix and a series of prefixes to the left of the macrostem. Those prefixes with H tone trigger downstep on an adjacent H tone across the macrostem boundary, while H tone suffixes are downstepped by an adjacent H tone at the right boundary of the macrostem. The verb stem also constitutes the domain of vowel harmony. A clitic group is attached at the right edge of the verb stem. The clitics are separate phonologically from the rest of the verb stem as they do not participate in vowel harmony, and initiate their own tonal complex. This outline illustrates both the complexity of the Moro verb as well as the interplay between phonological processes and morphological structure.

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