

Inalienable personal possessives in Moro and Tira

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1 Introduction¹

A grammatical distinction between alienable and inalienable possession is observed in many languages of the world. Alienable possession indicates temporary or loose ownership, whereas inalienable possession expresses a more intimate or inherent possession where the item cannot be separated from the owner, such as a part/whole relationship, body part or kin term (Nichols 1988). For example, in Manam (Austronesian), inalienable possessives include kin terms and other social/cultural relations, part/whole relationships, elements of the body and physical attributes. In (1), the kin term ‘father’ has a pronominal possessive suffix, but the word ‘loincloth’ shows a separate possessive classifier to which the suffix attaches (Lichtenberk 1983: 278, 294).

(1) Manam

- | | |
|------------------|-----------------------------|
| a. <i>tamágu</i> | b. <i>?úsi négu</i> |
| <i>tamá-gu</i> | <i>?úsi né-gu</i> |
| father-1SG.POSS | loincloth POSS.CLF-1SG.POSS |
| ‘my father’ | ‘my loincloth’ |

Inalienable possessive constructions such as those in (1) may involve obligatorily possessed nouns that cannot occur alone with a non-possessed or generic sense. In Dënesųłné (Athapaskan), the body part *naghé* ‘eye’ cannot occur alone, but must have a possessor, e.g., *dëne naghé* ‘person’s eye’ (Saxon & Wilhelm 2016: 43). Likewise, such nouns may have bound pronominal possessive affixes, as in Iipay (Kumeyaay, Yuman), where the kin term *-taʔ* ‘mother’ is a bound root with a possessive prefix: *?ə-taʔ* ‘my mother’, *pa-taʔ*

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‘his mother’ (Langdon 1970: 143). Haspelmath (2017) refers to these as possidend nouns.

There are two main syntactic means of indicating possession. Predicative possessive constructions relate two nominals via a predicate, often the verb ‘have’ or an existential copula (Stassen 2001). Attributive possessive constructions, on the other hand, involve two nominals that are juxtaposed and can be linked to each other via adnominal marking. One nominal is the possessor (dependent) and the other the possessum (head); the order in which they appear identifies their role and one or both may also be marked morphologically (Nichols 1988, 1992). If the head is marked, it is usually with possessive affixes, while if the dependent is marked, it is usually with genitive case, although there may also be agreement with the head. Inalienable/alienable distinctions are most commonly found with attributive constructions (Heine 1997).

In some languages, there is a split system where inalienable possessives have one type of marking and alienable possessives have another. For example, in Eastern Pomo (Pomoan), kin terms have head-marking (2a), whereas most other nouns have dependent marking with genitive case (2b) (McLendon 1975: 92, 108).

(2) Eastern Pomo

a.	<i>wíbayle</i>	b.	<i>wáx jári</i>
	<i>wí-bayle</i>		<i>wá-x jári</i>
	1SG-husband		1SG-GEN basket
	‘my husband’		‘my basket’

Kin terms are reported to manifest inalienable possession in the languages of the Nuba Mountains (Manfredi 2022). In this article, we examine kin terms in the West Heiban languages, Moro and Tira, both of which show the inalienable/alienable distinction. This distinction is manifested only with pronominal possession, and many of the terms are possidend nouns (with an obligatory possessive affix). The kin terms are a small set, numbering around 12 or 13 terms. They include consanguineal and affinal terms, as well as terms for close family-like relationships that we term ‘social’.

The inalienable pronominal possessives have a constellation of distinct properties, some of which point toward a grammaticalization path from independent alienable possessives. First, the pronominal person suffixes that mark inalienable possession show no number distinctions for the possessor, although they do show inclusive distinctions. This is in contrast to alienable possessive markers, which show eight person/number/inclusivity distinctions, suggesting a reduction in the number marking system for inalienable

possessives. Second, there are multiple methods of marking plural on the inalienably possessed noun, including noun class prefixes, additional concord markers on certain nouns, and plural suffixes; the additional concord markers appear to be preserved from older forms. Third, some inalienable possessives can appear either with no suffixes with a generic sense, or only when the possessor is itself case-marked. Fourth, in Tira, accusative case is marked with a suffix, either with or without a tone change vis-à-vis the nominative form, or there is no separate marker of accusative case.² While most inalienable kin terms show no overt accusative marking, a subset of three terms show a change in tone between nominative and accusative. Finally, both languages show vowel alternations in inalienable kin terms. In Moro, there is evidence for both root-controlled and suffix-controlled vowel harmony, but with restrictions on the domain of application in kin terms. In Tira, there are vowel alternations in the first person suffix that trace back to a former vowel harmony pattern.

Tira and Moro are classified as West Heiban languages, part of the Heiban group of Niger-Congo languages of the Nuba Mountains (Schadeberg 1981). They form part of the Kordofanian family, although the genetic status of this family has been called into question (Dimmendaal 2018). Heiban languages have a system of noun classes, marked in most cases by an initial consonant on the noun, with modifying elements showing noun class concord. Verbs have noun class agreement markers with nominals. The Heiban languages for which there are available data also have a nominative/accusative case alignment system with accusative case marking.

The Tira data in this paper are drawn from research with Himidan Hassen, a speaker of the Kadar dialect. Himidan is from the village of Kumo near the town of Kauda. He grew up speaking Tira, which he also learned to read and write in school, along with Arabic and English. He left the Nuba Mountains in 2005 and lived in Kakuma refugee camp and Nakuru in Kenya, where he also learned Swahili. Himidan currently lives in Canada and still speaks Tira regularly.

The Moro data were provided by Elyasir Julima, from Karakaray in the Moro Hills, a speaker of the Thetogovela dialect. Elyasir grew up primarily in Omdurman in a Moro-speaking area, and was raised by his grandmother who was monolingual in Moro. He returned to the Nuba Mountains during his childhood when feasible. Elyasir learned Arabic and English in school, but did not receive Moro language instruction. He moved to Egypt in 2001 with his Moro-speaking wife and children and then to the United States, where he has lived for over 20 years, making regular trips back to Sudan, or to Egypt where many Moro reside.

² Lack of overt accusative case marking is lexical. It is not an indication of differential object marking based on syntactic or semantic criteria.

The paper is organized as follows. In SECTION 2, we introduce possessive constructions, showing both nominal possession with genitive case, alienable and inalienable pronominal possessives and predicative possession. In SECTION 3, we introduce kin terms and show how the plural possessed forms are encoded. In SECTION 4, we discuss bare forms of nouns normally marked with inalienable suffixes. In SECTION 5, we discuss tone patterns in Tira inalienable forms, and in SECTION 6, we discuss vowel alternations.

2 Possessive constructions

Attributive possessive constructions in Moro and Tira can be divided into adnominal possession and pronominal possession. Pronominal possession shows distinctions between alienable and inalienable possession.

2.1 Adnominal possession

Adnominal possession is indicated in both languages with a genitive case prefix on the possessor that agrees in noun class with the possessum. The genitive prefix is of the shape *Cɛ́* in Tira and *íC:ɛ́* or *Cɛ́* in Moro, where C is a noun class concord consonant. The order of the phrase is POSSESSUM CL.GEN-POSSESSOR. Both possessor nouns in the data in (3) and (4) belong to CLg, but the noun class of the possessum differs based on plurality (CLl ‘egg’ or CLŋ ‘eggs’), which is reflected in the concord of the genitive prefix. The vowel of the genitive marker deletes before a vowel-initial noun, as in (3b) and (4b).³

(3) Tira

- | | | | |
|----|--------------------------|----|---------------------------|
| a. | <i>léŋ lékúkù</i> | b. | <i>ŋéŋ ŋórá</i> |
| | <i>léŋ lé-kúkù</i> | | <i>ŋéŋ ŋ-órá</i> |
| | CLl.egg CLl.GEN-CLg.Kuku | | CLŋ.egg CLŋ.GEN-CLg.child |
| | ‘Kuku’s egg’ | | ‘the child’s egg’ |

(4) Moro

- | | | | |
|----|--------------------------|----|-------------------------|
| a. | <i>léŋ íl:ɛ́kúk:ù</i> | b. | <i>ŋéŋ íŋ:úm:ið</i> |
| | <i>léŋ íl:ɛ́-kúk:ù</i> | | <i>ŋéŋ íŋ:-úm:ið</i> |
| | CLl.egg CLl.GEN-CLg.Kuku | | CLŋ.egg CLŋ.GEN-CLg.boy |
| | ‘Kuku’s egg’ | | ‘the boy’s eggs’ |

In Moro, the basic genitive case marker is *Cɛ́*. This is used for non-specific possession (5a) as well as in compounds (5b):

³ In other work, we indicate only high tone (á) in Moro and leave low tone unmarked; for ease of comparison with Tira, we mark low tone (à) as well in this paper.

- (5) Moro
- a. *ìrə̀ŋ gə̀màtʃó*
ìrə̀ŋ gə̀-màtʃó
 CLg.name CLg.GEN-CLg.man
 ‘name of an adult’
- b. *ŋàl:ətʃà ŋə̀láj*
ŋàl:ətʃà ŋə̀-láj
 CLŋ.sweetness CLŋ.GEN-CLl.bee
 ‘honey’ (lit. ‘sweetness of bees’)

If a specific individual/entity or a personal name is the possessor, then the ‘strong concord’ version of the genitive is used as in (4). The strong concord has the form *íC:š-*, with gemination of the concord marker, and an initial vowel (Jenks 2013a, 2013b). This seems to be an amalgamation of the demonstrative pronoun *íC:i*, which is also used as a relative pronoun, and the genitive marker *Cš-*. Indeed, in written Moro, the genitive construction is written with separate words, as NOUN *iCi* Cə̀ NOUN, as in the example from the story ‘The lion and the hyena’ in the Moro Story Corpus (<https://linguistics.berkeley.edu/moro/>) in (6):

- (6) Written Moro
- día irri rə̀ ŋwə̀lia*
día irri rə̀ ŋwə̀lia
 CLr.cow CLr.DEM CLr.GEN CLŋ.hyena
 ‘the hyena’s cow’

2.2 Alienable pronominal possession

For most nouns, pronominal possession is indexed by possessive pronouns which follow the noun and show concord for noun class.

- (7)
- | | Tira | Moro |
|-------|-----------------|-----------------------|
| 1SG | <i>éC-èní</i> | <i>íC:-ə̀ŋ-C-ə̀ŋ</i> |
| 2SG | <i>éC-š</i> | <i>íC:-ò-C:-è</i> |
| 3SG | <i>éC-úŋ</i> | <i>íC:-òŋ-C-òŋ</i> |
| 1DUAL | <i>éC-ə̀lí</i> | <i>íC:-ə̀lə̀ŋ-C-ì</i> |
| 1INCL | <i>éC-ə̀lír</i> | <i>íC:-ə̀ndí-C-ì</i> |
| 1EXCL | <i>éC-ə̀j</i> | <i>íC:-ə̀ŋ-C-ə̀ŋ</i> |
| 2PL | <i>éC-àló</i> | <i>íC:-àlš-C:-è</i> |
| 3PL | <i>éC-én</i> | <i>íC:-èn-C-èn</i> |

In Tira, the template *éC*-PRON is employed,⁴ whereas in Moro, it is either *íC*-PRON-*C*-*è* or *íC*:PRON-*C*:PRON (see also Jenks 2013a on Moro). The pronominal possessives are provided in (7).

Concord for noun class is shown in (8) for the 3PL form *éC-én*, where the *C* indicates concord with the noun class of the noun.

- (8) Tira
- | | | | |
|---------------------|--------------|-----------------------|---------------|
| a. <i>léŋ él-én</i> | ‘their egg’ | c. <i>àjén ég-én</i> | ‘their hill’ |
| b. <i>ŋéŋ éŋ-én</i> | ‘their eggs’ | d. <i>nàjén én-én</i> | ‘their hills’ |

A complete paradigm of Tira pronominal possessive pronouns is shown in (9) for the word *léŋ* ‘egg’, which is CL1. The first and second person forms all show a LH tone pattern on the pronoun, while the third person forms have H tone.

- (9) Tira *léŋ* ‘egg’
- | | | | | | |
|-----|-------------------|-------|-------------------|-------|--------------------|
| 1SG | <i>léŋ él-èŋí</i> | 1DUAL | <i>léŋ él-žlí</i> | 1INCL | <i>léŋ él-žlíŋ</i> |
| | | | | 1EXCL | <i>léŋ él-ǎj</i> |
| 2SG | <i>léŋ él-š</i> | | | 2PL | <i>léŋ él-àló</i> |
| 3SG | <i>léŋ él-úŋ</i> | | | 3PL | <i>léŋ él-én</i> |

Moro pronominal possessors have strong concord *íC*: with suffixes. There are two kinds of templates, one with reduplication and one without. For 2SG, 2PL and the inclusive forms, 1DUAL and 1INCL, the template is *íC*:PRON-*C*:*è*. The final /e/ is raised to [i] with 1DUAL and 1INCL due to height harmony triggered by the vowels /ɜ/ or /ɔ/ (Ritchart & Rose 2017). For 1SG, 1EXCL, 3SG and 3PL, the template is *íC*:PRON-*C*:PRON, with reduplication of the pronominal, as shown in (10) with the word *ðəl* ‘horn’ of CLð. The concord consonant is not geminated when following a consonant.

- (10) Moro *ðəl* ‘horn’
- | | |
|-------|-------------------------|
| 1SG | <i>ðəl íð:-əŋ-ð-əŋ</i> |
| 2SG | <i>ðəl íð:-ò-ð:-è</i> |
| 3SG | <i>ðəl íð:-òŋ-ð-òŋ</i> |
| 1DUAL | <i>ðəl íð:-žłəŋ-ð-ì</i> |
| 1INCL | <i>ðəl íð:-əndí-ð-ì</i> |
| 1EXCL | <i>ðəl íð:-àŋ-ð-àŋ</i> |
| 2PL | <i>ðəl íð:-àłó-ð:-è</i> |
| 3PL | <i>ðəl íð:-èn-ð-èn</i> |

⁴ Stevenson (1949; see Schadeberg (ed.) 2009) transcribes the initial vowel of the possessive template as [i].

Possession is one of the ways in which the Thetogovela dialect of Moro differs from standard written Moro. In written Moro, the paradigm in (11) is employed. The inclusive and plural forms resemble Thetogovela, but with no additional suffix, either *C:e* or reduplication. The singular forms are built from a different base *əlějə* and have person suffixes. In written Moro, the letters <đ ě ñ> correspond to [ð ɛ ŋ]. The *iCi* element is added for greater specificity, but is not required. Vowel harmony is responsible for the *eđ/iđ* alternation.⁵

- (11) Written Moro *đəl* ‘horn’
- | | |
|-------|---------------------------|
| 1SG | <i>đəl iđi đ-əlějə-ñi</i> |
| 2SG | <i>đəl iđi đ-əlaɾə-ŋa</i> |
| 3SG | <i>đəl iđi đ-əlějə-ŋu</i> |
| 1DUAL | <i>đəl iđi iđ-ələŋ</i> |
| 1INCL | <i>đəl iđi iđ-əndr</i> |
| 1EXCL | <i>đəl iđi eđ-añ</i> |
| 2PL | <i>đəl iđi eđ-alo</i> |
| 3PL | <i>đəl iđi eđ-en</i> |

2.3 Inalienable pronominal possession

Inalienable pronominal possessives are found only with a small set of kin terms. They involve bound suffixes with no number distinction for the possessor in the first, second and third person forms, where 1EXCL is the plural counterpart of 1SG. These suffixes also do not show noun class concord (although see SECTION 4.1 for exceptions with regard to plural marking). The suffixes are provided in (12):⁶

- (12)
- | | Tira | Moro |
|-----------|----------------|-------------------|
| 1SG/1EXCL | <i>-áj/-ěj</i> | <i>-əŋ</i> |
| 2SG/2PL | <i>-əló</i> | <i>-əlò</i> |
| 3SG/3PL | <i>-én</i> | <i>-èn</i> |
| 1DUAL | <i>-əlí</i> | <i>-ələŋ</i> |
| 1INCL | <i>-əlír</i> | <i>-ələŋ-əndr</i> |

The suffixes resemble the plural suffixes of possessive pronouns in both languages, although there are distinct forms for 1DUAL and 1INCL. The Moro 1INCL inalienable suffix is actually a double suffix consisting of the 1DUAL suffix *-ələŋ* and the 1INCL suffix *-əndr* found in alienable possessives. Examples are provided of two cognate nouns with these suffixes in (13) and (14). Note

⁵ Written Moro does not indicate tone, and since we do not know exactly how this would be pronounced when read aloud (this may depend on a person’s dialect), we only indicate the written form.

⁶ The vowel alternation will be addressed in SECTION 7.

that the root in Moro exhibits vowel harmony triggered by the 1DUAL and 1INCL suffixes, so the noun root *ðr-* raises to *ùr-*.⁷

- (13) Tira ‘sibling’ (noun class concord: *g*)
- | | | | |
|-----------|---------------|--------|----------------|
| 1SG/1EXCL | <i>ðr-áj</i> | 1 DUAL | <i>ðr-àlí</i> |
| 2SG/2PL | <i>ðr-àló</i> | 1 INCL | <i>ðr-àlír</i> |
| 3SG/3PL | <i>ðr-én</i> | | |
- (14) Moro ‘sibling’ (noun class concord: *g*)
- | | | | |
|-----------|---------------|--------|---------------------|
| 1SG/1EXCL | <i>ðr-àŋ</i> | 1 DUAL | <i>ùr-àlóŋ</i> |
| 2SG/2PL | <i>ðr-àlò</i> | 1 INCL | <i>ùr-àlóŋ-əndr</i> |
| 3SG/3PL | <i>ðr-èn</i> | | |

It has been noted in the typological literature that inalienable possessives tend to exhibit structural properties that distinguish them from alienable possessives (Heine 1997). First, they involve a tighter structural bond between possessum and possessor (Nichols 1992:117). Second, they have less complex structures (van Rijn 2016, Haspelmath 2017). The West Heiban inalienable possessives fit this typological profile. They have bound suffixes. The lack of noun class concord and lack of plural distinctions in (13) and (14) compared to those with alienable pronominal possessives can also be construed as less complex in terms of structure.

When two nominals are linked in an attributive possessive relationship, the genitive construction is used, regardless of whether one of the nouns has an inalienable pronominal suffix or not. In the examples in (15) and (16), there are two indications of possession, the inalienable bound suffix and the class-marked genitive prefix on the possessor. In (15a) and (16), the possessum is an inalienably marked noun and requires a possessive suffix.

- (15) Tira
- a. *ðéṭén ðékúkù*
ðéṭ-én *ðé-kúkù*
 CLð.father-3POSS CLð.GEN-CLg.Kuku
 ‘Kuku’s father’
- b. *léŋ léðéṭáj*
léŋ *lé-ðéṭ-áj*
 CLl.egg CLl.GEN-CLð.father-1POSS
 ‘my father’s egg’

⁷ It is possible to add the possessive pronouns used with alienable forms (as in SECTION 2.2) after these suffixed forms to disambiguate the number of the possessor: e.g., Tira *ðr-én ég-én* ‘their sibling’.

- (16) Moro
ùḍḗrén káljàsèr
ùḍḗr-én k-áljàsèr
 CLg.mat.uncle-3POSS CLg.GEN-CLg.Elyasir
 ‘Elyasir’s maternal uncle’

In (17) an example with two inalienably possessed nominals is shown. Here, the fact that both ‘uncle’ and ‘father’ are inalienably possessed does not affect the use of the genitive to link them.

- (17) Tira
ídérén kéḍétáj
ídér-én ké-ḍét-áj
 CLg.mat.uncle-3POSS CLg.GEN-CLḍ.father-1POSS
 ‘my father’s maternal uncle’

2.4 Predicative possession

Both Tira and Moro use the verb ‘have’ to express predicative possession between two nominals, including stand-alone pronouns:

- (18) Tira
àprí jèrḍó léḗ-è
àprí j-èrḍ-ó léḗ-è
 CLj.boy CLj-have-PFV CLL.egg-ACC
 ‘the boy has an egg’

- (19) Moro
íḡ:é-w ḡ-èrḗ-ó ìrìə joàḡnà
íḡ:é-w ḡ-èrḗ-ó ìrìə j-oàḡnà
 1SG.PRN-EMPH 1SG-have-PFV CLj.cow CLj-many
 ‘as for me, I have many cows’

Predicative pronominal possession in Tira involves juxtaposition of the noun and pronominal possessive pronouns with no copula, as in (20).

- (20) Tira
léḡ lôn íl-èḡí
léḡ lôn íl-èḡí
 CLL.egg CLj-DEM CLL.POSS-1SG.POSS
 ‘that egg is mine’

In Moro, the same construction includes a prefixed element *Cà-* instead of strong concord on the nominal. Jenks et al. (to appear) analyze this as the preverbal root clause element that normally appears on main clause verbs.

- (21) Moro
ðàmàlà ðàðó
ðàmàlà ð-à-ð-ó
 CLð.camel CLð-RTC-CLð-2SG.POSS
 ‘the camel is yours’

Stevenson (2009/1942) notes a similar element for Tira, namely *aC-* instead of *iC-* preceding the possessive pronoun. We gloss this as POSS.PRED. This is not found in Himidan’s speech. In Stevenson’s transcription, <th> is [ð] and he does not mark tone.

- (22) Tira
ireth kai agun
ireth k-ai a-g-un
 CLg.cloth CLg-DEM POSS.PRED-CLg.POSS-3SG.POSS
 ‘that cloth is his’

We now explore kin relationships in more detail, and then examine the phonological and morphological properties of the inalienable forms.

3 Kin relationships

Inalienable possession is only indicated on kin terms in Moro and Tira, and only for pronominals. Body parts, which are often inalienably possessed in other languages (Chappell & McGregor 1996, Nichols 1988), show alienable possession. TABLE 1 lays out the stems for the different kinds of kin terms. These are divided into consanguineal (blood) relations, affinal (marriage) relations and what we term ‘social’ kin terms. Social kin terms refer to relationships that are familial-like in terms of closeness, but would not fit into a family tree. The term ‘community’ is a loose translation for *dəng-*, expressing the concept of one’s immediate locale, which includes one’s neighbors, family and general close entourage. This word is inalienable in Moro but alienable in Tira. The word *əmàð-* for ‘peer/agemate’ is typically used to refer to those young men who are married at the same time in traditional marriage ceremonies. The shading in the cells is intended to highlight stems used for multiple kin relationships.

	MORO ⁸	TIRA
CONSANGUINEAL		
‘father/paternal uncle’	<i>èt-</i>	<i>ðét-</i>
‘mother/paternal aunt’	<i>lèŋg-</i>	<i>léŋg-</i>
‘maternal uncle/aunt’	<i>ùdár-</i>	<i>ídér-</i>
‘sibling/cousin’	<i>òr-</i>	<i>ðr-</i> ⁹ (paternal)
‘grandparent/grandchild’		<i>ùrnèŋg-</i>
‘offspring’	<i>íðjónŋ-</i>	<i>èðèŋg-</i>
AFFINAL		
‘parent-in-law/child-in-law’	<i>ùn-</i>	<i>ùn-</i>
‘co-spouse’	<i>ùmàrt-</i>	<i>èròmɿ-</i>
‘wife/fiancée’	<i>wàs-</i>	<i>w(à)-</i>
‘husband/fiancé’	<i>èváŋg-</i>	<i>èmàn-</i>
‘husband’s brother’	<i>èváŋg-</i>	<i>ij-</i>
‘brother’s wife’	<i>wàs-</i>	<i>ij-</i>
‘husband’s sister’	<i>wàs-</i>	<i>ij-</i>
‘wife’s brother’	<i>wàs-</i>	<i>ib-</i>
‘sister’s husband’	<i>ib-</i>	<i>ib-</i>
‘wife’s sister’	<i>ib-</i>	<i>ib-</i>
SOCIAL		
‘peer/agemate’	<i>èmàð-</i>	<i>èmàð-</i>
‘community’	<i>dèŋg-</i>	(alienable)

TABLE 1: Inalienable kin term stems

Both languages show similar kin terminology. There are no gender distinctions for many of the terms (uncle/aunt, sibling/cousin, grandparent/grandchild, parent-in-law/child-in-law), but gender is important for paternal/maternal lineage with respect to uncle and aunt. It is also important for determining sibling-in-law terms. However, for sibling-in-law, it is not the gender of the person referred to, but the anchor to ‘ego’ that matters. For example, in Tira, *ib-* is a sibling-in-law and can refer to a man or a woman, but only to sibling-in-laws for whom the anchor is a woman, either one’s wife or one’s sister being the anchor to the person being referred to.

There are some differences between the two languages for affinal relationships. Tira has two different words for different kinds of ‘sibling-in-laws’. The word *ij-* indicates a male anchor (husband/brother) of the referent and *ib-* indicates a female anchor (wife/sister). In Moro, the word *ib-* also refers to female anchors,

⁸ This list expands on the eight terms provided in Jenks (2013a).

⁹ This is only ‘paternal cousin’ in Tira. ‘Maternal cousin’ is indicated by a separate word with alienable possession.

but is not used for wife’s brother, for which *was-* is employed, which is generally used for male anchors. However, the term for a husband’s brother is the same as the word for ‘husband’.

In general, the types of kin terms documented for Moro and Tira resemble those documented in other Nuba Mountain languages (Manfredi 2022, Veit & Schneider-Blum 2024), particularly with respect to Koalib/Rere, another Heiban language (Demir Nalci et al., to appear). For example, there is a separate term for maternal uncle/aunt, while paternal uncle/aunt uses the same term as father/mother. Moro has no separate word for grandparent or grandchild, but Tira shows intergenerational skipping, with the same word employed for both grandparent and grandchild.

There are some other kin terms that do not have inalienable suffixes but instead employ the personal possessive pronouns of alienably possessed nominals, as discussed in SECTION 2.2. A list of alienable kinship terms is provided in TABLE 2.

	MORO	TIRA	COMMENT
CONSANGUINEAL			
‘dad’	<i>ápà</i>	<i>ábà</i>	term of address
‘mom’	<i>nánà</i>	<i>ájà</i>	term of address
‘grandfather’	<i>útódíó</i>	--	term for older man
‘grandmother’	<i>ópá</i>	--	term for older woman
‘maternal cousin’	--	<i>ηέρα</i>	
‘maternal sibling’	--	<i>ìlìṣìṣ</i>	
‘child’	<i>ηέρα</i>	<i>óra</i>	
SOCIAL			
‘community’		<i>ìdáná</i>	cf. Moro inalienable

TABLE 2: Alienable kin terms

Moro uses the general words for older man and older woman to refer to grandfather and grandmother. There is no distinct word for ‘grandchild’. The word for ‘maternal cousin’ in Tira is similar to the word for ‘child’ in Moro, which can also mean ‘girl’ more generally. Neither language has a gender-specific term ‘son’ or ‘daughter’. The inalienable gender-neutral term ‘offspring’ can be used, or the alienable word for ‘child’ or ‘boy’.

Examples of these kin terms with possessive pronouns are provided in (23) and (24):

- (23) Tira
ilìḡinà èg-èḡí
ilìḡinà *èg-èḡí*
 CLg.maternal sibling CLg.POSS-1SG.POSS
 ‘my maternal sibling’
- (24) Moro
ḡerà íḡ:òḡ:è
ḡerà íḡ:-ò-ḡ:-è
 CLḡ.child CLḡ.POSS-2SG.POSS-CLḡ-2SG.POSS
 ‘your child’

3.1 Plural of possessed

Inalienable kin terms often show double or even triple marking for plurality (see TABLE 3 and examples (25) and (26)).

	MORO		TIRA	
	SINGULAR	PLURAL	SINGULAR	PLURAL
‘father/pat. uncle’	<i>èḡ-</i>	<i>èr-</i>	<i>ḡ-èḡ-</i>	<i>r-èḡ-</i>
‘mother/pat. aunt’	<i>l-èḡḡ-</i>	<i>èl-</i>	<i>l-èḡḡ-</i>	<i>l-èl-</i>
‘mat. uncle/aunt’	<i>ùḡḡr-</i>	<i>l-ḡwḡr-l-</i>	<i>íḡḡr-</i>	<i>l-ḡḡr-l</i>
‘sibling/cousin’	<i>òr-</i>	<i>l-òr-l</i>	<i>ḡr-/àrò</i>	<i>l-ḡr-</i> <i>àl/làrò</i>
‘grandparent/grandchild’			<i>ùrn-èḡḡ-</i>	<i>l-ùrn-èḡḡ-</i>
‘parent/child-in-law’	<i>ùn-</i>	<i>èl-nw-</i>	<i>ùn-</i>	<i>l-ùn-</i>
‘co-spouse’	<i>ùm-àrt-</i>	<i>l-è-mùrt-</i>	<i>èr-èmt-</i>	<i>l-r-èmt-</i>
‘peer/close friend’	<i>è-màḡ-</i>	<i>l-è-màḡ-</i>	<i>è-màḡ-</i>	<i>l-è-màḡ</i>
‘sister’s husband/ wife’s sister’	<i>ìb-</i>	<i>l-àb-</i>	<i>ìb-</i>	<i>l-àb-(al)-</i>
‘brother’s spouse/ husband’s sibling’			<i>ìj-</i>	<i>l-ìj-l</i>
‘wife’	<i>wàs-</i>	<i>l-wàs-</i>	<i>w(a)-</i>	<i>l-áj-l-</i>
‘husband’	<i>è-váḡḡ-</i>	<i>l-à-vá-l</i>	<i>è-màn</i>	<i>l-è-màn</i>
‘offspring’	<i>íḡḡḡḡḡ-</i>	<i>l-íḡḡḡḡḡ-</i>	<i>èḡḡḡḡḡ-</i>	<i>l-èḡḡḡḡḡ-</i>
‘community’		<i>d-èḡḡ-</i>	--	--

TABLE 3: Inalienable singular/plural stems

The main method of indicating plural is through noun class. Inalienable kin terms belong to the human noun class pairing *g* (singular) and *l* (plural), except for ‘father’ in Tira, which is *ḡ* (singular)/*r* (plural) and ‘community’ which is a location and does not have noun class. Both Tira and Moro have lost the original

noun class prefix *k(w)/g(w), leaving vowel-initial nouns in the singular¹⁰ and an *l*-plural noun class prefix in most forms (see Schadeberg 1981, Gibbard et al. 2009 on Moro). Concord and verb agreement serve to reveal the noun class. Koalib maintains the original noun class marker of this class, as can be seen with the cognate of *ùn-/lùn-*, which is *kú:n-/lú:n-* ‘parent-in-law’ in Koalib (Rere) (Demir Nalci et al., to appear). The bound plural noun class marker is shown as a prefix in the table; this makes comparison with the singular easier. In addition to the prefix *l*- in the plural, there are some forms with an additional *l* following the root. We examine these in the next section.

3.2 Vestiges of noun class concord

An extra *l* appears between the root and inalienable suffixes in certain plural forms in both languages. Fuller forms with third person suffixes are in (25) and (26).

- (25) Tira
- | | | | | |
|----|----------------|-------------------------|-------------------|---------------------------|
| a. | <i>ídér-én</i> | ‘his/her m. uncle/aunt’ | <i>lédér-l-én</i> | ‘his/her m. uncles/aunts’ |
| b. | <i>w-én</i> | ‘his/her/their wife’ | <i>láj-l-én</i> | ‘her/their husbands’ |
- (26) Moro
- | | | | | |
|----|--------------|-------------------------|-----------------------|--------------------------|
| a. | <i>òr-én</i> | ‘his/her/their sibling’ | <i>lòr-l-én-àndá</i> | ‘his/her/their siblings’ |
| b. | <i>èv-én</i> | ‘her/their husband’ | <i>lèvá-l-én-àndá</i> | ‘her/their husbands’ |

If the grammaticalization pathway was that inalienable possessives developed from standard possessive pronouns that became bound to the kin term stems, this marker is likely the vestige of a noun class concord marker *l*- on person suffixes (cf. Tira alienable *léñ él-én* ‘their egg’). The concord marker [l] seems to have been preserved with nouns whose roots end in a vowel, glide or [r]. It is not preserved when the root ends in an obstruent [t ð s b] or a nasal [n].

Support for the additional *l* being a noun class marker comes from the fact that [ŋg] appears in the singular of the words for ‘offspring’, ‘husband’, ‘mother’ and ‘grandparent/grandchild’, where *l* appears in the plural (27)-(28). This marker is probably a former *g* noun class concord. Indeed, Tira has *ŋg* as a concord/agreement marker for this particular noun class.

¹⁰ In the *g*-class, the vowel can be analyzed as a noun class prefix, probably the remnant of the original noun class marker, that had a round vowel/labial glide. See Gibbard et al. (2009) for details.

(27) Tira
l'é-ŋg-én 'his/her/their mother' *l'é-l-én* 'his/her/their mothers'

(28) Moro
lè-ŋg-én 'his/her/their mother' *èl-én-àndá* 'his/her/their mothers'

The concord *g* is preserved with roots with a final vowel or final [ŋ]. Compare Moro *dəŋg-àp* 'my community' with Tira *ìdájá* 'community', which is an alienable form. However, not all words with *ŋg* in the singular have *l* in the plural. The words for 'offspring' and the Tira word for 'grandparent/grandchild' have final *ŋg* in the plural form as well. If the final *ŋg* was historically a concord marker, it is possible that it has now lexicalized and been extended to both singular and plural in these forms.

These vestiges of concord marking suggest a diachronic pathway whereby pronominal possessives became grammaticalized as bound inalienable suffixes on kin terms, with loss of the concord prefix in forms that ended in obstruents or nasals, but preservation with other roots.

3.3 Plural suffixes

The associative plural suffix is also added to inalienable kin terms as a mark of plurality. In Thetogovela Moro, the associative plural marker *-àndá* is used with proper nouns and certain alienable kin terms (29a-c). It has the allomorph *-ŋéndà* after vowel-final words. It is obligatorily used on all inalienable plural forms (29d-g).

- (29) Moro
- | | |
|------------------------|----------------------------|
| a. <i>dʒòrdʒ-àndá</i> | 'George and company' |
| b. <i>kúk:ù-ŋéndà</i> | 'Kuku and company' |
| c. <i>áp:à-ŋéndà</i> | 'dads/dads and company' |
| d. <i>èr-áp-àndá</i> | 'my fathers' |
| e. <i>èl-áp-àndá</i> | 'my mothers' |
| f. <i>lòrl-áp-àndá</i> | 'my siblings/pat. cousins' |
| g. <i>Iwàs-áp-àndá</i> | 'my wives' |

In Tira, the associative plural marker *-ŋá* can be used optionally on inalienable plural forms:

- (30) Tira
- | | |
|------------------------|------------------------|
| a. <i>kúkù-ŋá</i> | 'Kuku and company' |
| b. <i>ájà-ŋá</i> | 'mom/moms and company' |
| c. <i>l-ìb-èj(-ŋá)</i> | 'my siblings-in-law' |

A similar use of the associative plural on inalienable possessives is also noted for Koalib (Rere) (Demir Nalci et al., to appear) and other Nuba Mountain languages (see Manfredi 2022 for details). In Koalib (Rere), the associative plural *-(í)ḡá* occurs on the word for ‘mother’ (*léḡ-éí-ḡé* ‘my mothers’) and optionally on the word for father (*réḡ-éí(-ḡé)* ‘my fathers’) (Demir Nalci et al., to appear).

4 Bare forms

Certain kin nouns in both languages can occur with no inalienable suffixes, with a generic sense (see TABLE 4).

Some forms end in a consonant, but some of these forms have an extra vowel that does not appear with the suffixes, for example, Tira *ùnḡ* ‘an in-law’ vs. *ùn-éí* ‘my parent-in-law’. The form with the final vowel is likely to be the base and its vowel is deleted with the vowel-initial bound suffixes.

	MORO	TIRA
‘sibling, relative’	<i>òrḡwà</i>	<i>àrò</i>
‘wife’	<i>wàsà</i>	
‘co-spouse’		<i>èrḡmḡ</i>
‘in-law’	<i>ùnḡ</i>	
‘parent-in-law/child-in-law’		<i>ùnḡ</i>
‘peer/agemate’		<i>èmàḡ</i>
‘offspring’		<i>ìḡḡḡ</i>
‘grandparent/grandchild’		<i>ùrnḡ</i>

TABLE 4: Bare forms of inalienable possessives

In Moro, the word *òrḡwà* appears with an extra [wa] syllable in addition to the base *òr-* ‘sibling’. In written Moro, ‘his sister/brother’ does not use the inalienable possessive suffixes for third person but is instead expressed with *orba* (the standard written Moro form of *òrḡwà*) and an alienable possessive: e.g., *orba ḡèlḡḡḡ* ‘his/her sibling/relative’ (cf. (11) in SECTION 2.2). In Tira, the same word for ‘sibling/pat. cousin’ also cannot take third person inalienable suffixes and occurs alone or with a possessive pronoun: *àrò* (*éḡúḡ*) ‘his/her sibling’; otherwise, independent pronominal possessive pronouns are normally not used with inalienable kin terms in this manner.

In Moro, some stems can appear with no suffixes only with a case-marked overt nominal possessor. This occurs with ‘mother,’ ‘father’ and ‘uncle/aunt’ (Jenks & Sande 2017), as shown below. The name Kuku has an accusative case marker *-ḡ*. If the nominal possessor is not case marked, the inalienable suffix is required.

- (31) Moro
- a. *ləŋgə kúkɯ-ŋ* ‘Kuku’s mother’
 - b. *eɬə kúkɯ-ŋ* ‘Kuku’s father’
 - c. *uɖɜrəwɔ́ kúkɯ-ŋ* ‘Kuku’s uncle’

In Tira, the bare form can occur in a genitive construction without a generic meaning. However, this is an alternative to the form with the third person suffix, *ùn-én*.

- (32) Tira
- | | | |
|---|-----------|----------------------|
| <i>ùnɔ́</i> | <i>ké</i> | <i>ìb-èj</i> |
| CLg.parent-in-law | CLg.GEN | brother-in-law-1POSS |
| ‘my wife’s brother’s father-in-law’ ¹¹ | | |

These bare forms are also suggestive of diachronic development from unaffixed nouns to hosting inalienable pronominal possessive suffixes.

5 Tone marking accusative case in Tira

Tira marks accusative case with a variety of suffixes. The selection of which case allomorph to employ is lexically determined. In the examples in (33), the tone of the suffix matches the tone found on the final tone-bearing unit of the root.

- (33) Tira
- | | NOMINATIVE | ACCUSATIVE | |
|----|--------------|----------------|----------------|
| a. | <i>ðàŋàl</i> | <i>ðàŋàl-à</i> | ‘sheep’ |
| b. | <i>lómón</i> | <i>lómón-é</i> | ‘day’ |
| c. | <i>àprí</i> | <i>àprí-ŋá</i> | ‘boy’ |
| d. | <i>lídí</i> | <i>lídí-ɔ́</i> | ‘clay pot’ |
| e. | <i>èlâ</i> | <i>èl-è</i> | ‘mushroom sp.’ |

However, with other nouns, there are also tone changes on the stem, but not in a predictable manner. This is similar to patterns reported for Koalib (Rere) (Quint & Allasonnière-Tang 2022). (34b-c) show that a nominative LL can correspond to either LH-H or HH-H in the accusative.

- (34) Tira
- | | NOMINATIVE | | ACCUSATIVE | |
|----|----------------|----|------------------|--------------|
| a. | <i>ləmɔ́ð</i> | LH | <i>ləmɔ́ð-á</i> | LL-H ‘log’ |
| b. | <i>ùɾɔ́zèn</i> | LL | <i>ùɾɔ́zèn-é</i> | LH-H ‘gourd’ |

¹¹ As *ùnɔ́* can reference four relationships in English (father-in-law, mother-in-law, son-in-law, daughter-in-law) and *ìb-* can translate as three (wife’s brother, wife’s sister, sisters’s husband), there are many other possible translations for this sentence besides the one given here.

c.	<i>òrì</i>	LL	<i>órí-ṣé</i>	HH-H	‘water’
d.	<i>lùbùtù</i>	LHH	<i>lúbút-é</i>	HH-H	‘dove’

Some nouns show no distinction between nominative and accusative (35).

(35) Tira

	NOMINATIVE	ACCUSATIVE	
a.	<i>ḍár</i>	<i>ḍár</i>	‘rope’
b.	<i>ùḍḍ</i>	<i>ùḍḍ</i>	‘worm’
c.	<i>làṙà</i>	<i>làṙà</i>	‘candle’

So far we have not noted any lexical nouns in which the accusative is marked only by tone change, although such patterns are attested in Koalib (Rere) (Quint & Allasonnière-Tang 2022). Moro has a limited accusative case marking system (Jenks & Rose 2018) and does not seem to employ tone changes to mark accusative case.

Inalienable possessives in Tira do not have accusative case suffixes, but some nouns do show tone changes. Monosyllabic nouns that are H-toned in the nominative show a change in the accusative. The root is L and the suffix is -LH instead of -HH. This is the pattern found for ‘father’, ‘mother’ and ‘wives’.

<i>father H</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>ḍét-áj</i>	H-H	<i>ḍèt-áj</i>	L-H
2SG/2PL	<i>ḍuét-áló</i>	H-HH	<i>ḍèt-àló</i>	L-LH
3SG/3PL	<i>ḍét-én</i>	H-H	<i>ḍèt-én</i>	L-H
<i>mother H</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>létṅ-áj</i>	H-H	<i>lètṅ-áj</i>	L-H
2SG/2PL	<i>létṅ-áló</i>	H-HH	<i>lètṅ-àló</i>	L-LH
3SG/3PL	<i>létṅ-én</i>	H-H	<i>lètṅ-én</i>	L-H
<i>wives H</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>l-áj-l-áj</i>	H-H	<i>l-àj-l-áj</i>	L-H
2SG/2PL	<i>l-áj-l-áló</i>	H-HH	<i>l-àj-l-àló</i>	L-LH
3SG/3PL	<i>l-áj-l-én</i>	H-H	<i>l-àj-l-én</i>	L-H

TABLE 5: Tira tone change on root and second person suffix; H nominative roots

However, with all other nouns, no tone changes are found, and the nominative and accusative are identical in tone. This is true for all bisyllabic HH nouns, but also for other monosyllabic nouns such as parent-in-law, which has L-H in the nominative.

<i>parent-in-law L</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>ùn-éj</i>	L-H	<i>ùn-éj</i>	L-H
2SG/2PL	<i>ùn-àló</i>	L-LH	<i>ùn-àló</i>	L-LH
3SG/3PL	<i>ùn-én</i>	L-H	<i>ùn-én</i>	L-H
<i>peer LL</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>èmàð-áj</i>	LL-H	<i>èmàð-áj</i>	LL-H
2SG/2PL	<i>èmàð-àló</i>	LL-LH	<i>èmàð-àló</i>	LL-LH
3SG/3PL	<i>èmàð-én</i>	LL-H	<i>èmàð-én</i>	LL-H
<i>mat. uncle/aunt HH</i>	NOMINATIVE		ACCUSATIVE	
1SG/1EXCL	<i>ídér-éj</i>	HH-H	<i>ídér-éj</i>	HH-H
2SG/2PL	<i>ídér-àló</i>	HH-LH	<i>ídér-àló</i>	HH-LH
3SG/3PL	<i>ídér-én</i>	HH-H	<i>ídér-én</i>	HH-H

TABLE 6: Tira nouns with no tone change; L, LL and HH nominative roots (all other forms)

We analyze the tone changes in terms of accusative case being indicated by L tone on the root. There is no segmental accusative suffix in these forms that accompanies the L tone.¹² As there are multiple ways of marking accusative case, including no marking, the fact that some inalienable possessives show a tone change and some show no change is in keeping with the overall system of case marking. This is lexical, so we do not attempt to explain why certain nouns have this pattern and others do not.

However, the tone change on the second person suffix (-HH versus -LH) is not due to grammatical tone case assignment but to phonology. We maintain that the underlying form of the second person suffix is *-àló* with LH tone. This is the form that appears in both the nominative and accusative of all the other inalienable forms that do not show tone change, and it is the pattern for the 2PL alienable possessive. H tone spreads from the root to the suffix in the nominative, so /ðéʔ-àló/ → [ðéʔàló], as shown in (36):



H tone does not, however, spread from bisyllabic roots with HH tone. This is due to the way H tone spreading operates in Tira, being triggered only by a singly-linked autosegmental H tone. Consider the following sentences, drawn from Kaldhol (2024). In (37a), the LH noun *dijó* ‘cow’ spreads its H tone onto the low-toned

¹² Inalienably possessed nouns have vowel-initial suffixes. It is possible, therefore, that an accusative suffix has been attached to these forms, but due to vowel hiatus resolution, it does not surface.

object *ɣəm̀ð* ‘food’. In (37b), on the other hand, the HH noun *ðámlá* does not spread its tone as it is doubly linked.¹³

(37) Tira

a. *lá ɣátsà dijɔ ɣóm̀ð*
l-á ɣátsf-à dijɔ ɣóm̀ð
 CLI-IPFV give-FV CLr.cow CLɣ.food
 ‘they will give the cow food’

b. *lá ɣátsà ðámlá ɣəm̀ð*
l-á ɣátsf-à ðámlá ɣəm̀ð
 CLI-IPFV give-FV CLð.camel CLɣ.food
 ‘they will give the camel food’

H tone does not spread from the bisyllabic H toned forms such as *úðér-* due to the same restriction.

The tone change pattern is also seen with the singular noun ‘wife’ in (38), but the first and third person suffixes also show a tone change. While the second person suffix is *-áló* with LH tone, the first and third person suffixes have a $\overline{\text{LH}}$ rising tone rather than just H tone.

(38) Tira

<i>wife</i> H	NOMINATIVE		ACCUSATIVE	
1SG/1EXPL	<i>w-áj</i>	-H	<i>w-ǎj</i>	$-\overline{\text{LH}}$
2SG/2PL	<i>w-áló</i>	-HH	<i>w-áló</i>	-LH
3SG/3PL	<i>w-én</i>	-H	<i>w-ě́n</i>	$-\overline{\text{LH}}$

The plural form of ‘wife’ is *lájł-áj* ‘my wives’ (ACC. *lájł-áj*) and the Moro singular cognate is *wàs-*, e.g., *wàs-ájł* ‘my wife’. This suggests that the root may not just be /w-/, as it appears, but actually /wa-/.¹⁴ The root vowel is deleted before vowel-initial inalienable suffixes. If the tone on the accusative root is L, as it is in the plural, the L-H sequence would become a contour tone [ǎ] or [ě́] following vowel deletion; the root tone is recuperated on the suffix, a type of tone stability. This is demonstrated in (39).

(39) Tira

<i>wife</i> H	NOMINATIVE		ACCUSATIVE	
1SG/1EXPL	/wá-áj/	→ [wáj]	/wà-áj/	→ [wǎj]
2SG/2PL	/wá-áló/ → [wá-áló]	→ [wáló]	/wà-áló/	→ [wǎló]
3SG/3PL	/wá-én/	→ [wén]	/wà-én/	→ [wě́n]

¹³ These nouns are in object position, but have no overt accusative case marking.

¹⁴ There is another word *ðwá* ‘woman, female’ (cognate with Moro *ðwá*) which may or may not be related to *wà-*.

In conclusion, a small class of inalienable kin terms (‘mother’, ‘father’, ‘wife’) show accusative case via a tone change. The remaining inalienable kin terms show no distinction between nominative and accusative.

6 Vowel alternations

Both languages show vowel alternations in the inalienable possessives. These have to do with vowel harmony in Moro, and possible vestiges of vowel harmony in Tira.

6.1 Moro vowel harmony

Moro has a productive system of vowel harmony in which lower vowels /e a o ə/ are raised to their higher counterparts [i ɜ u ə] by the higher vowels /i ɜ u ə/ (Ritchart & Rose 2017). Harmony operates bidirectionally, but kin terms show restrictions in the progressive direction. See Jenks (2013a) for discussion.

Suffixes with lower vowels show raising when the suffixes are attached to stems with high vowels. This occurs with the stems *ùn-* (40c,f) and *ìb-* (40d,h). The first person /-áɲ/ and third person /-én/ suffixes are raised to [ɛɲ] and [ín] respectively. This is an example of progressive height harmony.

- (40) Moro progressive harmony
- | | | |
|----|--------------|--------------------------------|
| a. | <i>òr-áɲ</i> | ‘my/our (EXCL) sibling’ |
| b. | <i>èt-áɲ</i> | ‘my/our (EXCL) father’ |
| c. | <i>ùn-ɛɲ</i> | ‘my/our (EXCL) parent-in-law’ |
| d. | <i>ìb-ɛɲ</i> | ‘my/our (EXCL) sibling-in-law’ |
| e. | <i>òr-én</i> | ‘his/her/their sibling’ |
| g. | <i>èt-én</i> | ‘his/her/their father’ |
| f. | <i>ùn-ín</i> | ‘his/her/their parent-in-law’ |
| h. | <i>ìb-ín</i> | ‘his/her/their sibling-in-law’ |

Harmony can also operate in the regressive direction. This occurs with the first person dual suffix *-ɛ́lɛ́ɲ*, which has high vowels. It causes stems with low vowels to raise, so /o e a/ are raised to [u i ɜ] respectively.

- (41) Moro regressive vowel harmony from inalienable suffixes
- | | | | | | |
|----|----------------|-------------------------|----|--------------------|----------------------|
| a. | <i>òr-áɲ</i> | ‘my/our (EXCL) sibling’ | d. | <i>ùr-ɛ́lɛ́ɲ</i> | ‘our (DUAL) sibling’ |
| b. | <i>èt-áɲ</i> | ‘my father’ | e. | <i>ìt-ɛ́lɛ́ɲ</i> | ‘our (DUAL) father’ |
| c. | <i>èmàð-án</i> | ‘my peer’ | f. | <i>ìməð-ɛ́lɛ́ɲ</i> | ‘our (DUAL) peer’ |

The inalienable kin terms show two kinds of restrictions in the progressive direction related to a bisyllabic window. First, a bisyllabic root does not cause raising of a suffix (**ùdɛ́r-ín*). Instead, the form is disharmonic.

- (42) Moro monosyllabic inalienable suffixes
- a. *ùḍḗr-én* ‘his/her/their mat. uncle/aunt’
 - b. *ìḍḗḅḅg-én* ‘his/her/their offspring’
 - c. *ùmèrt-én* ‘his/her/their co-spouse’

Second, a bisyllabic suffix cannot undergo raising from a root with a high vowel (**ùn-èlú*, **ùn-èlò*), as shown for the second person suffix.

- (43) Moro bisyllabic inalienable suffixes
- a. *ùn-àló* ‘your parent-in-law’
 - b. *ìb-àló* ‘your sibling-in-law’

Both restrictions can be analyzed as harmony operating in a bisyllabic domain. Harmony can apply from root to suffix as long as both of them are monosyllabic. Harmony applies from the initial vowel of the root in (42), but applies only to the second root vowel. In (43), the initial vowel of the suffix is within a bisyllabic window, but this would make the suffix partially harmonized – **ìb-èlò* – which the language does not allow.

This restriction differs from progressive harmony in the verbal domain, which is iterative – both the manner applicative suffix *-aḍaṭ* and the imperfective suffix *-a* are raised by a high-voweled root (44b). Enclitics are outside the harmonic domain and do not harmonize (44c), but this is the only restriction on harmony.

- (44) Moro harmony in the verb
- a. *g-à-lág-àḍaṭ-à*
CLg-RTC-cultivate-MAN.APPL-IPFV
‘s/he is about to cultivate in this manner’
 - b. *g-è-kíḍ-èḍḗṭ-è*
CLg-RTC-open-MAN.APPL-IPFV
‘s/he is about to open in this manner’
 - c. *g-è-kíḍ-èḍḗṭ-è = lò*
CLg-RTC-open-MAN.APPL-IPFV-3PL.OBJ
‘s/he is about to open them in this manner’

The limitations on progressive harmony with inalienable suffixes are suggestive of gradual incorporation into the harmonic domain; vowel harmony is only partially extended to bound suffixes. It is not a restriction on particular suffixes, but on the size of the harmonic domain.

6.2 Tira vowel alternations

Tira does not have vowel harmony, but there are vowel alternations in the inalienable suffixes. These may be vestiges of a former harmony system. The first person possessive suffix has two allomorphs: *-aj* and *-ej*.

(45) Tira first person suffix allomorphs

	<i>-áj</i>		<i>-éj</i>
‘mother’	<i>léŋg-áj</i>	‘uncle/aunt’	<i>ídér-éj</i>
‘father’	<i>ðét-áj</i>	‘co-spouse’	<i>èrèmt-éj</i>
‘sibling’	<i>òr-áj</i>	‘sibling-in-law’	<i>ìb-éj</i>
‘wife’	<i>w-áj</i>	‘parent-in-law’	<i>ùn-éj</i>
‘husband’	<i>èmán-áj</i>	‘offspring’	<i>èðèŋg-éj</i>
‘peer/agemate’	<i>èmàð-áj</i>	‘grandfather’	<i>ùrnèŋg-éj</i>
‘sibling-in-law’	<i>ìj-áj</i>		

At first glance, there seems to be nothing that would predict the choice of suffix. Roots such as *èmán-* and *èðèŋg-* seem very similar phonologically in that both have low vowels. The tone of the root can be either low or high in both lists. However, when compared to the Moro cognates, a striking pattern emerges. The cognate stems of *-éj* forms all have high vowels in Moro (*ùdár-*, *ùmàrt-*, *ìb-*, *ùn-*, *íðéŋg-*) whereas the cognate stems of *-áj* forms all have lower vowels in Moro (*làŋg-*, *èt-*, *òr-*, *wàs-*, *èváŋg-*, *èmàð-*). There are no cognates for *ùrnèŋg* or *ìj-*, as Moro does not have these forms.

Simmons (2023) shows that Tira /ɛ/ corresponds to Moro high /ɜ/ or /i/, or to Moro low /e/. The alternation of the first person *-áj/-éj* suffix parallels the Moro first person suffix *-áj/-éj* alternation and appears to reflect an older vowel system before sound changes in Tira converted some high vowels to /ɛ/. *-ej* was likely **-ɛj*, with vowel raising applied to all suffixes following high vowels, but is now realized as [ɛ].

7 Conclusion

Moro and Tira both have a set of inalienable pronominal possessed kin terms. There are a number of affinal and social kin terms, with some differences between the two languages. These inalienably possessed kin terms use bound suffixes to express the pronominal possessor, but no number distinctions. There is additional plural marking of the possessed: leftover concord suggests grammaticalization from the concord of possessive pronouns while the use of the associative plural on kin terms is an areal phenomenon. In Tira, there are tone changes that index accusative case on certain inalienable forms. This can be explained as being part of the general case marking system of the language, which employs tone changes. Finally, there are vowel alternations in both

languages. In Moro, general vowel harmony shows domain restrictions, suggesting a gradual incorporation of former suffixes into the nominal system. In Tira, vowel alternations seem to be a synchronically arbitrary pattern, but a comparison with Moro shows that they are connected to a former vowel harmony system. These patterns are suggestive of a grammaticalization pathway from independent alienable pronominal possessives to inalienable suffixes, with a reduction in form of pronominal possessor marking.

Abbreviations

CL	noun class	MAN.APPL	manner applicative
CLF	classifier	OBJ	object
DEM	demonstrative	POSS	possessive
EXCL	exclusive	SG	singular
FV	final vowel	PL	plural
GEN	genitive	PRED	predicate
INCL	inclusive	RTC	root clause
IPFV	imperfective		

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