

2015

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Recommended Citation

Jakobi, Angelika and Hamdan, Ahmed (2015) "Number Marking on Karko Nouns," *Dotawo: A Journal of Nubian Studies*: Vol. 2 , Article 13.

Available at: <http://digitalcommons.fairfield.edu/djns/vol2/iss1/13>

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Number Marking on Karko Nouns

Angelika Jakobi and Ahmed Hamdan*

1. Introduction

Karko is a little described language¹ spoken in the west of the northern Nuba Mountains of Sudan. Karko speakers refer to their language by the terms *kâñŋ* or *káákmbèè*. The latter term is a genitive noun phrase literally meaning “Karko’s language.” According to the co-author of this paper, who is a mother-tongue speaker of Karko, the Karko population amounts to about 15,000 individuals, most of whom are living in urban centers outside of the rural Karko area, e.g. in the southern Kordofan towns Dilling and Kadugli, in the northern Kordofan city of El-Obeid, and even in Khartoum, and Port Sudan. The co-author of this paper claims that the scattered Karko communities stick to their language and culture, in spite of their fragmentation.

Karko is part of Kordofan Nubian, a group of closely related languages which are also known as Hill Nubian (in German as *Bergnubisch*). They represent a branch of the Nubian language family which, according to Claude Rilly,² is genetically related to Nara in Eritrea, Ama (Nyima) in the Nuba Mountains, Tama of Darfur, and even the extinct Meroitic language. These languages form the northern subgroup of Eastern Sudanic which, in turn, is a primary branch of Nilo-Saharan.

With respect to number marking, there are considerable differences between the Nile Nubian languages and the Kordofan Nubian languages. In the Nile Nubian languages – i.e. Old Nubian, Nobiin, Dongolawi, and Kunuz (also known as Kenzi or Kenuzi) – only plural

* We are grateful for Vincent van Gerven Oei’s and Gertrud Schneider-Blum’s helpful comments on previous drafts of our paper.

1 In JAKOBI’s ms *Kordofan Nubian: A Synchronic and Diachronic Study* (to appear) there is a grammatical sketch of Karko.

2 RILLY, *Le méroïtique et sa famille linguistique*.

suffixes are employed. According to Werner, Nobiin has four suffixes, two having a low tone, *-ii*, *-ncii*, and two having a high tone, *-rīi* and *-gūu* (allomorph *-kūu*). The noun root preceding the plural suffix always takes low tone(s), no matter which tone(s) the noun root has in the singular form.³

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1	<i>dīrbád / dīrbàd-ii</i>	“chicken / chickens”
2	<i>úmbúu / ùmbùu-ncii</i>	“trunk of date-palm / trunks of date-palm”
3	<i>áadèm / àadèm-rīi</i>	“person / people”
4	<i>gòr / gòr-kūu</i>	“heifer / heifers”

In the Kordofan Nubian languages, by contrast, number marking on nouns is much more complex. In fact, it has features characteristic of the system attested in many other Nilo-Saharan languages. According to Dimmendaal, this system “involves a tripartite division between singulative, plural, and replacive marking on nouns.”⁴ The characteristics of this system are briefly illustrated in exx. 5–10 from Tagle, a Kordofan Nubian language spoken in the east of the northern Nuba Mountains.⁵

Singulative marking is defined as the marking of an inherently plural noun stem.⁶ The marked singulative form contrasts with the unmarked plural form. This number marking pattern is attested on nouns that designate items that naturally occur in collectives, such as hair and beans, as seen in exx. 5 and 6. The singulative form designates a single item out of that natural group or collective of items. This suggests that singulative marking has a semantic base.

5	<i>ʔil-tô / ʔil</i>	“(a single) hair / hair”
6	<i>ókù-dû / úkù</i>	“bean / beans”

Plural marking involves a variety of suffixes which are attached to an inherently singular noun stem, as already illustrated by the Nobiin exx. 1–4. In the Kordofan Nubian languages, however, the suffixation of specific plural markers may trigger the alternation of the root vowel. This is shown in the Tagle ex. 8, where the plural suffix *-ì* triggers the root vowel /*ε*/ to be realized as [ɪ] in the plural form.

7	<i>ʔɔŋ / ʔɔŋ-ì</i>	“calebash bowl / calebash bowls”
8	<i>têr / tìr-ì</i>	“girl / girls”

3 WERNER, *Grammatik des Nobiin*, p. 80.

4 DIMMENDAAL, “Number Marking and Noun Categorization in Nilo-Saharan Languages,” p. 214.

5 The Tagle language is also considered in IBRAHIM & JAKOBI, “Attributive Modifiers in Taglennaa.”

6 DIMMENDAAL, “Number Marking and Noun Categorization in Nilo-Saharan Languages,” p. 220.

The replacement pattern, in turn, involves a set of paired singular and plural suffixes that replace each other, as attested by the suffixes -à / -í and -ū / -î in exx. 9 and 10.

tùjj-à / t'újj-í "trough/troughs"
 kít-ū / kít-î "door/doors"

9
 10

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The examples also illustrate that tonal alternations are involved in number marking on nouns. Tone as a concomitant and even sole number marking device is addressed in our comments on several tables discussed in section 4 and 5 below. However, we will not offer a full discussion of tone and its function in number marking.

Apart from these formal aspects, the marking or non-marking of nouns for number may be semantically motivated. Whereas nouns designating natural collectives or pairs of items are often unmarked for number, nouns designating individuated items being part of these collectives are marked by singulatives, as illustrated in exx. 5 and 6. Moreover, body part and kinship terms as well as diminutives often select specific number markers. This fact provides another piece of evidence of the relevance of semantics in number marking.

A further semantic property of the typical Nilo-Saharan number marking system is related to the grammatical behavior of nouns denoting substances and collectives.⁷ In Karko, as we will show in section 6, nouns denoting substances grammatically behave like count nouns. Unlike English which often does not allow the plural marking of nouns denoting a substance (*beers, *bloods), in Karko it is quite possible to attach a plural suffix to such nouns. The unmarked counterpart, however, is either inherently singular or plural. This can be seen from their modifiers (e.g. demonstratives, adjectives) which occur in the singular or plural form, respectively.

The aim of our paper is to provide evidence of this rich system in Karko, but we also intend to show how this system is complicated by morphophonemic alternations of the nominal roots, including quality and quantity changes of the root vowel and the deletion of root-final consonants. These alternations often result in changes of the syllable structure.

2. Phonology, syllable structure, and morphophonemic alternations

Before embarking on the main topic of our paper, we will provide a brief outline of the Karko vowel system, the syllable structure, and the alternations of the noun roots. These issues are relevant to un-

⁷ Ibid., pp. 292f.

derstand the alternations encountered in the number marking system.

As seen in table 1, Karko has a vowel system characterized by the distinction of eight vowel qualities. Except for the mid-central vowel /ə/, which is attested as short vowel only, all other vowels appear both short and long. That is, there is a phonological opposition between short and long vowels.

When /ə/ and /ɔ/ are lengthened they are both realized as [ɔ:]. That is, there is a phonological opposition between the short vowels /ə/ and /ɔ/ but the opposition between /ə:/ and /ɔ:/ is neutralized in favor of /ɔ:/.

Table 1. The vowel system

i, i:	u, u:
e, e:	o, o:
ə	
ɛ, ɛ:	ɔ, ɔ:
a, a:	

Note: In order to provide space for the tonal accents, long vowels are written as double vowels in the examples below, for example, jīl instead of jī:l, and tēē instead of tē:.

Unlike other Kordofan Nubian languages, Karko has a special type of vowel harmony system which is characterized by progressive vowel assimilation.⁸ Except for the diminutive plural suffix -nēē (see section 5), syllabic suffixes employed in number marking have an unspecified vowel. This target (suffix) vowel assimilates all phonological features of the trigger (root) vowel, i.e. the suffix “copies” the phonological features of the root vowel. This can be briefly illustrated by the plural suffix -Vnd, which is realized as [end], [and], or [ond], respectively, depending on the preceding root vowel, e.g. ēb-ēnd “tail-PL,” ām-ānd “ram-PL,” and ōr-ōnd “head-PL.”⁹ Although these examples appear to suggest that tone is “copied” to the suffix vowel, this is not the case. In fact, tone is not conceived to be a property of a vowel but rather a property of a syllable. Evidence for this is provided by lost syllables whose tones often attach to the previous syllable (for more details, see below).

Karko also differs from other Kordofan Nubian languages in admitting complex syllables, including syllables ending in two consonants. Table 2 provides an overview of the possible syllable types attested in monosyllabic words. They can be grouped into syllables

8 The scope of the vowel copying system and its limits have not yet been investigated. We can, however, safely say that, except for the diminutive plural marker -nēē, all syllabic number marking suffixes attest vowel copying.

9 Abbreviations used: * - unattested; 1, 2, 3 - 1st, 2nd, 3rd person; Ar. - Arabic; C - consonant; IMP - imperative; OBJ - object; PL - plural; SG - singular; SBJ - subject; sp. - species; V - vowel; VN - verbal noun.

with a short vowel (V, VC, CV, CVC, VCC, CVCC) and corresponding syllables with a long vowel (V:, V:C, CV:, CV:C, V:CC, and CV:CC). The syllable structures V and CV are rare; they occur in function words rather than in content words.

Syllable types with short vowel	V	è “I (1SG SBJ),” à “you (2SG OBJ)”
	VC	èt “baobab-tree,” ar “container,” òg “blood”
	CV	gɔ̄ “this,” té “he, she, it (3SG SBJ)”
	CVC	têr “bull,” dât “clay,” bût “cat”
	VCC	ɔ̄nd “husband’s sibling,” ànd “donkey,” ènd “Pennisetum millet,” ə̀d “breast”
Syllable types with long vowel	CVCC	tõnd “child,” jíld “tooth,” d̀ə̀ld “granary”
	V:	òò “hot,” òò “head,” úú “hawk”
	V:C	íil “body,” ēēb “tail,” áàm “ram”
	CV:	tíí “beer,” bùù “antelope,” ʃɔ̄ɔ̄ “year”
	CV:C	ʃɪl “chief,” t̄ēj “oil,” b̀̀ɔ̄ɔ̄ “dog”
	CV:CC	báàld “locust,” kààng “Karko language”

Table 2. Syllable types of monosyllabic words 275

Some word-initial consonants are attested with labialization, e.g. [tw, ʃw, ʃw, kw, dw, d̄w, jw, gw, ŋw], but they do not have phoneme status because they are always followed by one of the front vowels, /i, e, ε/, or the low central vowel /a/, as illustrated in table 3. This distributional restriction is also true for word-initial [w]. For this reason labialization is not considered to be a feature of those consonants but rather a characteristic of the vowels realized as [wi, wi:, we, we:, wε, wε:, wa, wa:]. Note that the front vowels /i, e, ε/ and the central low vowel /a/ are also attested without labialisation when following an initial consonant.

w	wéend “soil,” wād “in-law (wife’s father, daughter’s husband)”
tw	twàn “chin”
t̄w	t̄wéè “calebash bowl.PL,” t̄wǎr “frog.PL”
ʃw	ʃwìid “sand,” ʃwáad “whip”
kw	kwéétég “setting bones.VN,” kwèèd “tree sp. (Ar. <i>nabaq</i>),” kwàâ “spear”
dw	dwééd “cloud,” dwád “running.VN”
d̄w	d̄wàà “wrestling.VN”
jw	jwáá “duckweed”
gw	gwág “ant-eater”
nw	nwàár “run.IMP.2SG”
ɲw	ɲwààɲ “long and pointed (e.g. nose)”
ŋw	ŋwáɲ “snore.VN,” ŋwáɲ “cooked first milk of cow or goat,” ŋwéénd “rubbish”

Table 3. (C)w + front vowel

Morphophonemic alternations of roots play an important role in Karko grammar. In the nominal number marking system we encounter:

1. lengthening of the root vowel in the unmarked singular or plural forms of nouns, e.g. jíł-d / jíil “toot/teeth,” ēēb / ēb-ēnd “tail/tails”;
2. quality alternations of the root vowel which commonly coincide with quantity alternations, e.g. ʃòò / ʃêr “giraffe,” tēē / tēr “girl”;
3. loss of root-final /r/, e.g. òò / òr-ònd “head” and tíí / tîr “beer,” see table 21.

The lengthening of the root vowel (either in the singular or plural form) is only attested by nouns having a morphologically unmarked (C)VC-shaped root. Thus in this environment the phonological opposition between short and long vowels is neutralized; in other words, the lengthening of the root-vowel of a noun is predictable.¹⁰

Nouns that do not fulfill these conditions do not exhibit a quantity alternation of their root vowel. This is true for nouns that have – both in the singular and the plural form – a (C)VC-root with a short vowel. These nouns are assumed to have lost a syllabic suffix, e.g. ʃíj / ʃíj “maternal uncle” and êt / êt “sibling.” This assumption is supported by the presence of falling and rising tones on these monosyllabic nouns. Falling and rising tones often reflect the loss of a syllabic suffix. The tone of that suffix is preserved by attaching to the preceding tone of the root.¹¹

Moreover nouns having a long root vowel both in the singular and plural form retain this long vowel, as is attested in māā / māā-nd “hum of camel,” kēē-d / kēē-n “tree sp. (Ar. *giddēem*).” Also quantity alternations of the root vowel neither occur on nouns with a (C)VCC-shaped root, e.g. ènd / ènd-ēn “donkey,” dèld / dèld-ēn “granary,” nor on bisyllabic nouns, e.g. bóḡèl / bóḡèl-d “lion,” and kāmàl / kāmàl-ān “camel.”

As for the quality alternation of the root vowel – which commonly coincides with a quantity alternation – we assume that it is triggered by a lost syllabic suffix represented by or including a high front vowel.¹² Due to this vowel, the root vowel is raised, that is, $\varepsilon \rightarrow e$ and $\circ \rightarrow \text{ə}$, as attested by tēē / tēr “girl,” bòòl / bòl “dog,” əl-d / əl “breast.”

After having provided some phonological and morphophonemic background information, we will now turn to the main topic.

10 According to HELLWIG & SCHNEIDER-BLUM, “Tabaq,” this neutralization is also attested in Tabaq, a language closely related to Karko.

11 The assumption that the rising tone in the plural form of Karko êt / êt “sibling” originates in a lost syllabic suffix whose tone has attached to the previous tone is corroborated by the cognates ɪt-á / ɪt-ā attested in the closely related Kwashi language.

12 In the closely related Kwashi language the assumed high front vowel is realized as [i]. It is attested both as the plural suffix -i, e.g. bòòl / ból-ī “dog” and as part of the singulative suffix -dī, e.g. òl-dī / ól “breast.” It may be noticed that in this language, too, the suffix vowel [i] triggers the raising of the root vowel /ɔ/ which is therefore realized as [o].

We will first address singulative marking, then, in section 4, plural marking, and in section 5 the replacement pattern. Section 6 is devoted to the grammatical behavior of nouns denoting substances and natural collectives. In section 7 we will summarize our findings and raise some questions to be answered in future studies.

3. Singulative marking

In Karko there are two singulative suffixes, $-(V)t$ and $-d$, as illustrated in tables 4 and 5, respectively. The corresponding plural forms are morphologically unmarked.

Table 4 shows that the singulative suffix $-(V)t$ has two allomorphs: $-t$ is selected when following a vowel-final root, $-Vt$ after a consonant-final root. Contrary to our expectation, the singulative form of “hair” is not $t\bar{e}l-\acute{e}t$ but rather $\text{t}\bar{e}r-\acute{e}t$. So the root-final /l/ is realized as retroflex [r]. This may be due to the adoption of the retroflex articulation of the word-initial /t/. The noun $\text{t}\bar{e}r-\acute{e}t$ / $t\bar{e}l$ is also irregular in respect to the uncommon alternation of the word-initial consonant: in the singular form there is an alveolar-retroflex /t/ but in the plural form there is a dental /t/.

singular	plural	gloss
wèê-t	wèè	sorghum cereal
t̄er-ét	tèèl	hair
ènd-ét	ènd	Pennisetum millet

Table 4. The singulative $-(V)t$, plural unmarked

Word-final stops are commonly unaspirated. However, the consonant of the suffix $-(V)t$ is always realized as an aspirated voiceless dental stop [tʰ]. This aspiration reflects a lost vowel which is still retained in the other Kordofan Nubian languages, for instance, in Tagle $\text{t}\bar{r}l-t\bar{u}$ “(a single) hair.”

As illustrated by $t\bar{e}l$ in table 4 and by $j\bar{r}l$ and $\text{ɔ}\bar{ɔ}l$ in table 5, the root vowels are lengthened when the root has a (C)VC-structure; in other words, $tel \sim \text{t}\bar{e}l$, $jil \sim j\bar{r}l$ and $\text{ə}l \sim \text{ɔ}\bar{ɔ}l$ are considered to represent the roots, respectively.

singular	plural	gloss
jíl-d	j̄r̄l	tooth
əl-d	ɔ̄ɔ̄l	breast

Table 5. The singulative $-d$, plural unmarked

The pattern attested in table 5 is reversed in the nouns presented in table 7 where the nouns have an unmarked singular form and a plural form marked by $-d$.

4. Plural marking

Plural marking in Karko involves a variety of suffixes which are attached to an inherently singular noun stem. They are *-(V)nd*, *-ɖ*, *-(V)l*, *-Vr*, *-Vɲ*, *-Vŋ*.

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The suffix *-(V)nd* has two allomorphs: *-Vnd* occurs on roots ending in a consonant and *-nd* on roots ending in a vowel. In the case of *ōō / ōr-ōnd* ‘‘head’’ we assume that *ōr* is the root, as attested in the plural form, and that the root-final /r/ has been deleted in the singular form. This is a common process in the language, as illustrated in table 21.

Depending on the syllable structure of the noun root, the singular form may undergo a lengthening of the root vowel or not. In case of *ōg* and *úk*, for instance, we assume that a singular suffix has been lost from this root. For this reason the root vowel is not lengthened. In case of *ōō* and *ēēb*, however, we assume that the root is monosyllabic having the syllable structure VC, as attested in the plural forms, *ōr-ōnd* and *ēb-ēnd*. Monosyllabic roots of this shape predictably undergo vowel lengthening.

Table 6 shows that the suffix *-(V)nd* is conspicuously frequent on body part terms, however not exclusively, as *-(V)nd* is also attested on other nouns.

Table 6. The plural suffix *-(V)nd*

singular	plural	gloss
ōg	ōg-ōnd	blood
úk	ūk-ūnd	fire
ōō	ōr-ōnd	head
ēēb	ēb-ēnd	tail
îɲ	îɲ-înd	scorpion
áàm	ām-ānd	ram
fēē	fēē-nd	udder
fēēl	fēl-ēnd	penis
māā	māā-nd	hum of camel
būūg	būg-ūnd	back, upper part of -
kālî	kálî-nd	door
kàlî	kálî-nd	female friend of a female

As illustrated in Table 7, the plural suffix *-ɖ* occurs on nouns ending in the lateral /l/. Many of these nouns have a (C)VC-root and therefore lengthen the root vowel in the unmarked singular form. These nouns also share a high-low tone pattern in the singular form and a (mid-)mid pattern in the plural.

The pattern attested in table 7 is the reversed pattern of the nouns presented in table 4 where -d is used as singulative marker, the plural being unmarked.

singular	plural	gloss
îl	îl-d	body
áàl	āl-d	heart
fáàl	fāl-d	compound
tíŋil	tíŋil-d	baboon
kámə̀l	kāməl-d	axe
bə̀gə̀l	bə̀gəl-d	lion

Table 7. The plural suffix -d 279

The plural suffix -(V)l is attested on vowel-final and consonant-final nouns, see table 8. After vowel-final nouns the allomorph -l is selected, after consonant-final nouns the allomorph -Vl. The suffix often (though not always) coincides with a mid-mid tone pattern. The predictable lengthening of the root-vowel is attested in the unmarked nouns hɔ̀j, tɛ̀j, éj whose basic root structure is (C)VC, as attested in the plural forms.

The last item in this table attests to re-syllabification. The singular form ə̀bət has a bisyllabic structure, V.CVC which changes to ə̀bt having the structure VC.C when the plural suffix -Vl is attached. So the second vowel of ə̀bət is deleted when -Vl is attached. This pattern of resyllabification is also attested in several other bisyllabic nouns, see table 10.

singular	plural	gloss
āt	āt-əl	water-pot
ōnd	ōnd-əl	star
éj	ēj-əl	milk
tɛ̀j	tɛ̀j-əl	oil
hɔ̀j	hə̀j-əl	forked pole
ə̀rtí	ə̀rtí-l	sheep
ə̀bət	ə̀bt-əl	wing

Table 8. The plural suffix -(V)l

The suffix -Vr shown in table 9 is attested with a low tone or a falling tone. The preceding root has various tones but a high tone is not attested.

The suffix is frequently – though not exclusively – found on nouns designating animals.

singular	plural	gloss
kòk	kòk-òr	chicken
bùt	bùt-ùr	cat

Table 9. The plural suffix -Vr

singular	plural	gloss
bəg	bəg-ə̀r	he-goat
kəŋ	kəŋ-ə̀r	snake
kəŋ ¹³	kəŋ-ə̀r	hornbill
mũnd	mũnd-úr	rifle
kùd	kùd-úr	pig

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The suffix $-Vŋ$ is attested on monosyllabic and bisyllabic nouns; see table 10. When it attaches to bisyllabic nouns of the type CV.CVC and when the word-final consonant is /l/, the vowel preceding /l/ is deleted. For this reason the syllable structure of the stem changes from CV.CVC to CVC.CVC when $-Vŋ$ is attached, e.g. $ʃə.kəl$ / $ʃək.ləŋ$ and $kwə.dəl$ / $kwəd.ləŋ$.

Table 10. The plural suffix $-(V)ŋ$

singular	plural	gloss
ìr	ìr-ìŋ	river
ə̀r	ə̀r-ə̀ŋ	rope
tə̀r	tə̀r-ə̀ŋ	bull
ənɖ	ənɖ-ə̀ŋ	donkey
ɖə̀ɖ	ɖə̀ɖ-ə̀ŋ	granary
ɖəlɖ	ɖəlɖ-ə̀ŋ	drum
kàməl	kàmɪ-ə̀ŋ	camel
ʃəkəl	ʃəkɪ-ə̀ŋ	gazelle
būdúl	búdɪ-úŋ	hare
kwədəl	kwədɪ-ə̀ŋ	cock

The suffix $-Vŋ$ is particularly frequent. It also appears on nouns borrowed from Arabic; see table 11, suggesting that this plural suffix is highly productive. Another suffix attested on borrowings is $-Vŋ$, see table 14.

Table 11. The plural suffix $-(V)ŋ$ on borrowings

singular	plural	gloss
bāráád	bāráád-áŋ	tea pot
tēyáàr	tēyáár-áŋ	aeroplane
ārbíē	ārbíé-éŋ	car
kārááj	kārááj-áŋ	copybook

The suffix $-Vŋ$ is also attested on kinship terms where it is always realized with a falling tone, as shown in table 12. However, not all kinship terms take this suffix. Some singular and plural forms of kinship terms are solely distinguished by tonal contrast, as seen in table 20.

13 As the singular form of $kəŋ$ “hornbill” has a low-high-low tone pattern, we decided to distribute the tonal accents over the vowel and the following velar nasal.

The suffix $-V\eta$ assigns a distinct tone pattern to the plural form of a noun, i.e. a mid tone is assigned to the root while the suffix $-V\eta$ has a falling tone. The suffix $-V\eta$ has an allomorph $-V\eta$ which is selected when the preceding consonant is a palatal nasal, as attested in $\bar{a}\eta-\hat{a}\eta$. Probably, the selection of the allomorph $-V\eta$ is motivated by dissimilation, that is, to avoid the sequence of two palatal nasals in one word. Alternatively, the suffix $-\hat{a}\eta$ may be conceived of as a realization of $-V\eta$ in table 13.

singular	plural	gloss
ɔl	ɔl-ɔ̄ɲ	wife's mother and her female relatives
át	át-âɲ	grandchild
ām	ām-âɲ	grandmother
āɲ	āɲ-âɲ	father's sister
êɲ	êɲ-êɲ	mother
fāg	fāg-âɲ	father
kēr	kēr-ēɲ	brother-in-law
kēd	kēd-êɲ ¹⁴	sister's son
wād	wād-âɲ	wife's father
ɔ̄nd	ɔ̄nd-ɔ̄ɲ	husband's sibling

Table 12. The plural suffix $-V\eta$ on kinship terms

Table 13 shows nouns taking the plural suffix $-V\eta$. Except for $\bar{a}r-\hat{a}\eta$, the marked plural forms are attested with low tones.

singular	plural	gloss
ār	ār-âɲ	container made from cow dung
fūt	fūt-ùɲ	parcel, something wrapped up
kàr	kàr-èɲ	shield
tùlɔ	tùlɔ-ùɲ	ostrich
kàlɔ	kàlɔ-èɲ	vulture
bàlɔ	bàlɔ-èɲ	stranger

Table 13. The plural suffix $-V\eta$

Apart from $-V\eta$, the plural suffix $-(V)\eta$ is attested on nouns borrowed from Arabic.

singular	plural	gloss
kīt	kīt-īɲ	book
fēēnèè	fēēnèè-ɲ	tray

Table 14. The plural suffix $-V\eta$ on borrowed nouns

14 The noun $kēd / kēd-êɲ$ is also attested with the replacement pattern, $kē-d / kē-n$, with the suffixes $-d$ and $-n$ replacing each other.

5. The replacement pattern

The replacement pattern in Karko is not restricted to singular and plural suffixes replacing each other. It is also realized by tonal contrast, for which see table 20, and by root vowel alternations, for which see tables 21 and 22.

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The suffix $-(V)t$ has already been introduced in table 4 where it is employed as a singulative marker on a few nouns whose plural forms are unmarked for number. In tables 15–17, $-(V)t$ is found to be additionally used as a singular (rather than singulative) marker in a replacement pattern.

Table 15 provides examples of the replacement pattern in which the suffix $-(V)t$ is used to mark the singular while the plural is marked by $-(V)n$. This pattern coincides with the alternation of the root vowel quality in $n\bar{a}-t / n\hat{o}-n$ ‘‘horn.’’

Table 15. Singular $-(V)t$ and plural $-(V)n$ replacing each other

singular	plural	gloss
$\grave{e}-t$	$\grave{e}-n$	baobab-tree
$n\bar{a}-t$	$n\hat{o}-n$	horn
$d\grave{a}-t$	$d\grave{a}-n$	water-melon
$k\grave{e}-t$	$k\grave{e}-n$	garment, cloth
$f\bar{e}-t$	$f\bar{e}-n$	cucumber
$k\grave{a}-t$	$k\grave{a}-n$	field
$m\grave{\grave{e}}-t$	$m\grave{\grave{e}}-n$	tree sp.
$\grave{a}m-\grave{a}t$	$\grave{a}m-\grave{a}n$	moon, month

In Table 16, $-(V)t$ is replaced by the suffix $-(V)l$.

Table 16. Singular $-(V)t$ and plural $-(V)l$ replacing each other

singular	plural	gloss
$f\grave{e}-t$	$f\grave{e}-l$	rib
$j\grave{\grave{e}}-t$	$j\grave{\grave{e}}-l$	cowry shell
$k\acute{a}-t$	$k\acute{a}-l$	eye
$g\grave{a}-t$	$g\grave{a}-l$	kind of tree
$m\bar{e}\bar{e}-t$	$m\bar{e}\bar{e}-l$	adult circumcised man
$w\grave{\grave{a}}-t$	$w\grave{\grave{a}}-l$	charcoal
$kw\grave{\grave{e}}-t$	$kw\grave{\grave{e}}-l$	egg
$k\grave{a}m-\grave{a}t$	$k\grave{a}m-\grave{a}l$	guinea-fowl

Table 17 illustrates a few nouns attesting the suffixes $-(V)t$ and $-(V)r$ in the replacement pattern.

Table 17. Singular $-(V)t$ and plural $-(V)r$ replacing each other

singular	plural	gloss
$k\grave{o}-t$	$k\bar{o}-r$	man
$k\acute{o}-t$	$k\grave{o}-r$	heifer, young cow

singular	plural	gloss
gì-t	gì-r	tree sp. (Ar. <i>himmeeđ</i>)
kwâ-t	kwâ-r	shoe
kwà-t	kwà-r	pebble

The $-(V)d$ and $-(V)n$ suffixes are frequently attested, as seen in table 18. Due to the fact that the replacement pattern is realized by pairs of singular and plural suffixes, the nouns do not provide evidence of predictable vowel root lengthening since this occurs only on morphologically unmarked nouns.

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singular	plural	gloss
î-d	î-n	person
bê-d	bê-n	co-wife, wife's brother's wife
kê-d	kê-n	sister's son
ūr-ūd	ūr-ûn	Acacia sp. (Ar. <i>haraaza</i>)
əb-əd	əb-ən	tree sp. (Ar. <i>ushar</i>)
ēg-ēd	ēg-ēn	tree sp.
kéé-d	kéé-n	tree sp. (Ar. <i>giddeem</i>)
kwèè-d	kwèè-n	tree sp. (Ar. <i>nabaq</i>)
kwèê-d	kwèê-n	bone

Table 18. Singular $-(V)d$ and plural $-(V)n$ replacing each other

In table 19 the number marking patterns of $kùl-d / kûl$ “mountain,” $jâl-d / jâl$ “tongue” and $bígít / bīg$ “worm” look like a singulative marking with an unmarked plural form. However, if the plural were unmarked we would expect a noun root of the syllable structure CVC to have a long vowel, as explained in section 2. Since the vowels of $kûl$, $jâl$, and $bīg$ are short, these forms rather suggest a lost plural suffix. This assumption is corroborated by the falling (i.e. high-low) tone – at least on $kûl$ and $jâl$ – that suggests that the low tone of the suffix has attached to the tone of the root.

Because of the lost plural suffix, the number markers on these nouns are assumed to reflect the replacement pattern $-d / \emptyset$ and $-(V)t / \emptyset$.

singular	plural	gloss
$kùl-d$	$kûl$	mountain
$jâl-d$	$jâl$	tongue
$bíg-it$	$bīg$	worm

Table 18. $-d / \emptyset$ and $-(V)t / \emptyset$ replacing each other

There are a few nouns attesting the replacement pattern only by means of tonal contrast; see table 20. Since this specific number marking device is restricted to kinship terms it provides another

piece of evidence supporting the assumption that the selection of number markers has a semantic base.

Table 20.
Tonal
contrast
284 distinguish-
ing singular
and plural
forms of
kinship
terms

singular	plural	gloss
ḗt	ět	sibling
t̥íj	t̥ij	maternal uncle
éd	ěd	in-law (husband's relative)
ágàt	ágăt	grandfather

Table 21 provides examples illustrating another variant of the replacement pattern. There is an alternation of noun roots with a long vowel in the singular and a short vowel in the plural. Nouns whose roots end in /r/ delete this consonant in the singular form, as seen in t̥íí / t̥ír, and several other examples. Additionally the quality of the root vowel may alternate, as seen in t̥éé / t̥èr and ʃòò / ʃêr. The vowel alternations follow fixed patterns, ε → e and ɔ → ə, and are triggered by a lost -i suffix marking the plural forms.¹⁵

Table 21. Vowel
quantity
alternations

singular	plural	gloss
ūū	úr	hawk
t̥éé	t̥èr	girl
t̥íí	t̥ír	beer
hīī	hīr ¹⁶	owl
tūū	tūr	stump of tree
ʃòò	ʃêr	giraffe
qòò	qèr	skin
hōō	hêr	tree
bùù	būr	antelope
kōōl	kôl	well
kōōl	kêl	house
ʃīīl	ʃīl	chief
bòòl	bêl	dog
kòòl	kêl	stick
kààl	kàl	porridge (Ar. ʕaṣiida)
ṭwāá	ṭwār	frog

Table 22. Vowel
quality
alternations

singular	plural	gloss
ṭwāá	ṭwéé	calabash bowl
kwāâ	kwéé	spear

Finally, the replacement pattern is also attested by the diminutive

¹⁵ See fn. 11.

¹⁶ As the tone pattern of hir PL is low-high-low, we decided to distribute the tonal accents both over the vowel and the final r.

suffixes -nd / -néè. In contrast to the other number marking suffixes that are immediately attached to the noun root, the diminutive suffixes are attached to the noun stem which may be extended by a number marking suffix. Thus diminutive forms are often doubly marked for number.

The diminutive suffixes may trigger morphological and tonal alternations of the root. The suffix -nd is apparently associated with a high tone which raises the tone of the stem, as can be seen in all singular forms presented in Table 23. Moreover, when -nd is attached to the stem, the singular suffix -t is deleted, and the root vowel, in turn, is extended in compensation for the deleted -t, as illustrated by kò-t-nd → kòó-nd. When -nd is attached to root-final /l/ this consonant is fused with the suffix -nd and realized as [ld], see bò̀l-nd → bò̀óld. The diminutive plural suffix is always realized as [é:], i.e. with a long vowel and a high-low tone pattern. It is not affected by vowel copying like other syllabic number marking suffixes.

The diminutive designates small sized objects or young beings and objects. The question of whether it may also be used to express endearment or even lack of respect, as attested in Tabaq and Midob,¹⁷ requires further research.

singular	plural	gloss
kò-t-nd → kòó-nd	kò-r-néè → kòr-néè	boy, lit. young/small man
téè-nd → téé-nd	tèr-néè → tèr-néè	young/small girl
bò̀l-nd → bò̀óld	bâl-néè → bâl-néè	young/small dog
hõõ-nd → hõó-nd	hâr-néè → hâr-néè	young/small tree

Table 23. The diminutive suffixes, singular -nd and plural -néè

6. Grammatical behavior of nouns denoting substances and collectives

In contrast to [-countable] mass nouns in English and other European languages, in many Nilo-Saharan languages such nouns grammatically behave like [+countable] nouns, as they can take plural suffixes.¹⁸ Karko is not an exception, as attested by two examples, òg / òg-ònd “blood” and tēēj / tēē-ēl “oil.”

òg-ònd tiínâ íííéè
 blood-PL 3PL.GEN be.different.3PL
 “Their blood [groups] are different”
 (lit. “Their bloods are different”)

¹⁷ See BASHIR’s and ISMAIL’s papers in this volume.

¹⁸ DIMMENDAAL, “Number Marking and Noun Categorization in Nilo-Saharan Languages,” p. 223.

- 12 ʔēj-ēl kākāj-ág á kwál-àr
 oil-PL how.many-ACC 2SG have-PRS.2SG
 “How many [kinds of] oil do you have?”
 (lit. “How many oils do you have?”)

286 The morphologically unmarked member of such nouns denoting liquids and substances is either inherently singular or plural. The inherent number of such a noun can be identified by means of a modifier which appears in its singular or plural form, respectively. For the purpose of illustration we have chosen the modifiers búù / bùù “strong, hard,” ʃír / ʃír “grey, dirty,” and òò / wāā “hot.” It turns out that the Karko nouns “clay,” “soil,” “food,” “sand,” and “oil” are inherently singular because they select modifiers having a singular form.

Table 24.
 Inherently singular
 nouns

noun + SG modifier	gloss
dēt búù	hard clay
wéènd ʃír	grey soil
kām òò	hot food
ʃwìd òò	hot sand
ʔēēj òò	hot oil

By contrast, the Karko nouns “water,” “milk,” “madiida (a local drink),” and “Pennisetum millet” are inherently plural since they take modifiers having a plural form.

Table 25.
 Inherently plural
 nouns

noun + PL modifier	gloss
át ʃír	dirty water
ééj wāā	hot milk
kōr wāā	hot madiida drink
ènd wāā	hot Pennisetum millet

As for Karko count nouns, not all have distinct singular and plural forms. Some examples of count nouns without a morphologically marked number distinction are listed in table 26.

Table 26. Count
 nouns without a
 morphologically
 marked number
 distinction

count nouns	gloss
īt	louse /lice
àl	leaf /leaves
əʃ	hand /hands
ʃɔ̄	year /years
tòm	bee /bees
tēē	cow /cows
ʔwàà	black ant /black ants

count nouns	gloss
twār	termite / termites

With these count nouns the distinction of singular and plural number is expressed by means of modifiers like gō “this” and gər “these,” for example, gō it “this louse” and gər it “these lice.” Semantically, these nouns refer to items which commonly exist in natural collectives, as attested by tēē “cow / cows,” terms for insects, paired body parts such as əf “hand / hands,” and series such as fōō “year / years.” Even the absence of number markers on these nouns confirms the relevance of semantics in the marking or – for that matter – non-marking of number.

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7. Conclusions

Number marking on Karko nouns is extremely rich and complex. Apart from the tripartite system involving singulative suffixes, plural suffixes, and a replacement pattern, which is typical of many Nilo-Saharan languages,¹⁹ number may be solely marked by one of the following devices: tonal contrast and morphophonemic alternations of the root vowel in respect to quantity and quality. Combinations of these devices are also attested.

For some of the number marking patterns it is easy to find many examples, but for other patterns only very few examples have been found. Apparently the most frequent suffix is the plural marker –Vɲ. The fact that it is also used on borrowed nouns suggests that it is a highly productive suffix that may be used for an open class of nouns. Another productive plural suffix is –Vŋ. Our sample of borrowings is probably too small to make a more definite statement on the possible use of other number markers.

The selection of specific number markers is often semantically motivated. This is particularly true for singulative markers which designate single items belonging to natural collectives or paired items, such as “teeth” and “breasts.” Also kinship and body part terms tend to select specific number suffixes, although these suffixes may also be used on other nouns. Diminutives are another semantically defined group of nouns that select a specific pair of singular and plural suffixes. Moreover, nouns designating natural collectives are often found to be unmarked for number, as seen in tables 4, 5, and 26. The interplay between the semantic grouping of nouns and their formal marking may be conceived of as a linguistic device for noun classification.

19 DIMMENDAAL, “Number Marking and Noun Categorization in Nilo-Saharan Languages,” p. 214.

The function of tone in number marking on nouns has not been investigated in detail. However, our data show that certain tone patterns re-occur and that singular and plural forms can even be solely marked by tonal contrast. So the relevance of tone in number marking is apparent, but it still requires a more refined study in the context of a general investigation on tone in Karko grammar.

Our paper is only a preliminary study of number marking on nouns. One of the questions not yet addressed is how numerals that are used as modifiers on noun phrases interact with number marking on the head noun. In a recent comparative study on noun phrases in the Nubian languages, Suzan Alamin has found “[w]hen the numeral refers to several entities the head noun is not marked for plural.”²⁰ Is this true for Karko, too?

Another question is whether number marking on nouns interacts with verbal number marking, also known as pluractional marking. These questions provide some suggestions for future research.

20 ALAMIN, “Noun Phrase Constructions in Nubian Languages,” p. 213.

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