Luo Verb Morphology: A Description and an Optimality-Theoretic Account

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Field Methods 2
29 March 1999

In this paper I will catalog and describe the morphology of verbs in Luo as spoken in Kenya by our class informant Atieno Adaala. In addition to describing the morphology, I will attempt to account for the placement of those morphemes in Optimality Theory, which I believe will help me provide a coherent account of morpheme placement.

Let me begin by defining some terms that I will be using in my description and analysis. I will define a *verb stem* as that form that is used as the present infinitive. It is a form of the verb with no pronominal prefixes, and typically has a final {-o}. The *verb root* is the form that corresponds to the singular imperative. For those verbs that have a final {-o}, the verb root is lacking it. For those verbs which have no final {-o} in the present infinitive, the verb root and the verb stem are identical.

(1) Present Indicative

A. Present infinitive

"to write"	ndiko	"to study"	somo
"to come"	biro	"to sell"	uso

B. Present indicative paradigm

I write	andiko	I study	asomo
you write	indiko	you study	isomo
he/she writes	ondiko	he/she studies	osomo
we write	wandiko	we study	wasomo
you (pl.)write	undiko	you (pl.) study	usomo
they write	gindiko	they study	gisomo

(I have included complete the paradigms of the verbs included in this paper in the appendix.)

As one can see from these examples, the present infinitive is formed from the verb stem (present infinitive) and a pronominal prefix. In sentences that have overt subjects, the pronominal prefix is omitted.

C. Overt subjects with present indicative

[ojo: uso]   "Oyo sells"

The present indicative forms also give not only the English "he writes" meaning, but also "he is writing" meaning. There is no separate present progressive form.

(2) Plain Past

A. Plain past conjugation

I wrote	nandiko	I studied	nasomo
you wrote	nindiko	you studied	nisomo
he/she wrote	nondiko	he/she studied	nosomo
we wrote	newandiko	we studied	newasomo
you (pl.) wrote	neundiko	you (pl.) studied	neusomo
they wrote	negindiko	they studied	negisomo

B. Plain past with an overt subject

       [ojo: nouso]   "Oyo sold"

The plain past forms similarly to the present indicative, and likewise encompasses the progressive aspect of English. It is composed of the verb stem preceded by the pronominal prefix. The past tense itself is marked by the addition of the prefix {n-} in the singular forms, and {ne-} in the plural. Unclear from just this paradigm is the status of the {ne-} form. Is the vowel epenthetic, or is it an additional overt plural marker? With overt subjects, unlike the present indicative, the pronominal prefix is maintained in the past.

(3) Additional tenses with one prefix

(For the entire paradigm, see appendix.)

A. Future tense

I will write	abondiko	I will study	abosomo
we will write	wabondiko	we will study	wabosomo

B. Perfect tense/aspect

I have written	asendiko	I have studied	asesomo
we have written	wasendiko	we have studied	wasesomo

C. Present subjunctive

I should write	onegandik	I should study	onegasom
we should write	onegowandik	we should study	onegowasom

D. Present optative

| I may write | dipopandiko | I may study | dipopasomo |
| we may write | dipopwandiko | we may study | dipopwasomo |

E. Conditional

| I would write | dandiko | I would study | dasomo |
| we would write | dewandiko | we would study | dewasomo |

F. Jussive

| let me write! | andik! | let me study! | asom! |
| let us write! | wandik! | let us study! | wasom! |

The tense marking of Luo, at first glance, begins to seem a bit irregular. Not only is it apparently unpredictable morphologically which forms use the verb root over the verb stem, the future tense is marked by a prefix {bo-} that comes between the pronominal prefix and the verb: an order that is contradictory to the morpheme placement of the plain past. The perfect tense is marked similarly with {se-} coming after the pronominal prefix. The other aspects given in C. through E. have morphemes that behave like the past marker and come prior to the pronominal prefix: the subjunctive is marked by {oneg-} or {onego-} in the plural; the optative by {dipop-} throughout; and the conditional by {d-} in the singular or {de-} in the plural. One additional thing of note is that of all these forms in A. through E., only the subjunctive takes the verb root rather than the verb stem. What happens when morphemes are concatenated and more than one must be used?

(4) Tenses/Aspects with Multiple Morphemes

A. Past Perfect/Pluperfect

| I had written | nasendiko | I had studied | nasesomo |
| we had written | newasendiko | we had studied | newasesomo |

B. Past Subjunctive

| I should have written | nonegandik | I should have sold | nonegaus |
| we should have written | nonegowandik | we should have sold | nonegowaus |

These two paradigms suggest two things: first, that the tense morphemes need not occur together, as in the past perfect; second, that the [ne-] form of the past tense is probably the result of an epenthetic vowel and not a distinct plural form. The past subjunctive, where the past marker falls before a vowel-initial morpheme, the [e] is not present, and as we can see from the forms of the vowel-initial verb [uso] "sell", there is no particularly strong prohibition against vowel-vowel sequences. Also note that the past subjunctive, like the present subjunctive, is formed with the verb root.

How does the negative morpheme interact with the others?

(5) Negativization

A. <u>Present negative</u>

I don't write	okandik	I don't study	okasom
we don't write	okwandik	we don't study	okwasom

B. <u>Future negative</u>

I will not write	okabendiko	I will not sell	okabeuso
we will not write	okwabendiko	we will not sell	okwabeuso

C. <u>Past negative</u>

I didn't write	nokandiko	I didn't sell	nokauso
we didn't write	nokwandiko	we didn't sell	nokwauso

D. Imperative/<u>Jussive negative</u>

don't let me write!   kikandik!

don't let us write!   kikwandik!

We can see from these forms that the negative marker is not the same everywhere. The imperative/jussive negative takes {kik-} rather than the {ok-} found elsewhere. In both cases, however, there is no epenthesis when consonants come together. Like the tenses in (4) that take two tense markers, there is no regular order of tense marker and negation marker.

(6) Synthesis

In all of the verb forms above, there is one consistency: the verb is always last in the string of morphemes. Whether the tense marker comes before the pronoun, or after, however, seems largely unpredictable. In the following table, I list all the verbal morphology and indicate where they come with respect to the pronoun in the verbal complex.

<u>Precede Pronoun</u>	<u>Follow Pronoun</u>

n(e)-	past	bo-	future
ok-	negative	se-	perfect
oneg(o)-	subjunctive		
dipop-	optative		
d(e)-	conditional		
kik-	jus. negative		

From this table, we can see that all tense/aspect markers that precede the pronoun are consonant-final. Furthermore, we can also see that those markers that have a final voiced consonant sometimes occur with epenthetic vowels. The nouns of Luo are often consonant-final, and undergo a regular devoicing process, but when followed by a vowel, as in plural-formation, the underlying voicing contrast may be revealed.

tooth	lak	teeth	lake
tortoise	opuk	tortoises	opuge

Based on this, one can argue that voicing is only contrastive in onset position. It is also the case that coda consonants are generally dispreferred in Luo. When possessive pronouns are added to noun stems that are consonant-final, there is often an epenthetic vowel added, particularly if the consonant is voiced underlyingly.

my comb	ragonda	my soil	lopa
their comb	ragond(w)gi	their soil	lobgi

What is plain from both the verbal and nominal examples is that, despite some previous claims (Harris 1998), coda consonants are not restricted to only word-internal situations. While some coda consonants may occur, they only occur at morpheme boundaries, butthere is, however, some restriction on what consonants can surface in codas. The movement of morphemes can be attributed to a desire, not only to preserve voicing contrasts, but also to create better syllables. There is no voicing contrast in nasals to be preserved since nasals do not run the risk of being devoiced syllable-finally. More likely, is the notion that while coda consonants are not forbidden, when possible, they are avoided. When a consonant-final morpheme can come before a vowel-initial pronoun, it can produce a well-formed CV syllable. When there is no advantage to it, then the morpheme is not moved from its syntactically preferred position. I have considered and rejected the notion that Luo is an isolating language, and that these are word-, as well as morpheme-boundaries. If coda consonants are permitted word-finally, there would be no justification for any epenthetic vowels, and less for movement driven by syllable structures.

(7) Analysis

In syntax, the verb phrase takes on the following structure, where S=Sentence; NP=NounPhrase; NegP=NegationPhrase; TP=TensePhrase; VP=VerbPhrase:

S

$\wedge$

NP VP

•

○ $\wedge$

NegP V' .

▪ $\wedge$

TP V'

▪ $\wedge$

V NP

If the morphology were to follow a straightforward concatenation process based on the syntactic structure, we would expect the tense markers all to fall inside the negative marker and the verb stem/root, and for the negative marker to fall inside the pronominal prefix and the verb. I do not know what is the preferred order for tense vs. aspect, so I will assume that it is either not relevant, or that aspect (AspP) would fall between NegP and TP. This syntactic account would give us the following constraints:

AlignTenseL: Align tense/aspect markers to left edge of the verb

AlignNegL: Align the negative marker to the left edge of the verb

AlignPronL: Align the pronominal prefix to the left edge of the verb

With the following harmonic ranking:

AlignTenseL >> AlignNegL >> AlignPronL

Ranked around these, are constraints that speak to syllable structure and faithfulness to the input, and certain output forms.

Onset: syllables must have an onset

NoCoda: syllables must not have codas

Ident [voi]: preserve the voicing feature of an input segment in its corresponding output segment

Dep: all output segments must have a corresponding input segment

Max: all input segments must have a corresponding output segment

*Lar & NoCoda: no voiced obstruents in coda position

OO-FaithV : all singular/plural verb forms should preserve the vowels in the 3rd person output form that agrees with it in number.

The final constraint-ranking, therefore, should be the following:

*Lar & NoCoda, Max, OO-Faith Ordering >> OO-Faith Order >> OO-FaithV, Ident [voi] >> AlignTenseL, NoCoda, Dep >> AlignNegL >> AlignPronL, Onset.

Tableau 1. Present indicative: {wa}+ {ndiko}

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
K a. wandiko										
b. ndikowa									*!	

The AlignPronL constraint is violated because the pronoun is not to the immediate left of the verb. Now that we know this works in the simple case, what about a real test? ranking

Tableau 2. Plain past: {a} + {n} + {ndiko}

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. anendiko							*		*!	*
K b. nandiko					*					

Tableau 3. Plain past: {gi} + {n} + {ndiko}ranking

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. ginendiko						*	*		*!	

b. gindiko		*!							
K c. negindiko					*		*		

In these tableaux, the AlignTenseL constraint is violated when the tense marker does not fall to the immediate left of the verb. Max is violated when a consonant in the input is not parsed into the output. NoCoda is violated when a consonant is parsed in a CVC syllable. Dep is violated when a vowel is inserted. Notice that it is the AlignPronL constraint that decides the winning candidate. This is a case of emergence of the unmarked. Again, I have shown that this ranking will work for a single morpheme that is consonant-final. What about two morphemes? ranking

Tableau 4. Past perfect: {a} + {n} + {se} + {ndiko}

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. ansendiko					*	*!			**	*
K b. nasendiko									*	
c. senandiko					**!*					

I have marked two violations for AlignTenseL in c. since there are two tense morphemes that are not aligned to the immediate left of the verb. {se-} also takes a third violation because there are two morphemes between it and the verb (in this tableau it is not necessary, however); one violation is incurred for each leftward movement away from the verb, as in the following tableaux. ranking

Tableau 5. Past subjunctive: {gi} + {oneg} + {n} + {ndiko}

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. gionegonendiko					*		**		*!*	*

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
b. nonekgindiko				*!	**	*				
c. noneggindiko	*!				**	*				
K d. nonegogindiko					**		*			

The constraint *Lar& NoCoda is violated in c. because there is a voiced obstruent parsed as a coda. Ident [voi] is violated in b. when the final consonant of {oneg-} is devoiced in coda position. As before in the simpler cases, it is AlignPronL that ultimately decides the winning candidate. ranking

Tableau 6. Past negative: {wa} + {ok} + {n} + {ndiko}

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. waoknndiko						**		*	*!*	*
b. nwaokndiko					**	*!			*	
c. newaokndiko					**	*!	*		*	*
K d. nokwandiko					**			*		

Tableau 7. Past subjunctive: {wa} + {oneg} + {n} + {ndiko}   ranking

	*Lar & NoCoda	Max	OO FaithV	Ident [voi]	Align TenseL	No Coda	Dep	Align NegL	Align PronL	Onset
a. waonegonendiko					*		**		*!*	*

b. nonekwandiko			*!	*	**				
c. nonegwandiko			*!		**				
K d. nonegowandiko					**		*		

In Tableau 7, we see that the high-ranked output-output constraint forces paradigm regularity, by requiring the epenthetic vowel, and it is once again the AlignPronL constraint that exerts its influence.

One more constraint will be necessarily be added to force another kind of paradigm regularity. Another OO-Faith constraint that will require vowel-initial verbs to follow the morpheme-ordering of consonant-initial roots. This is certainly a justifiable constraint since consonant-initial verbs are far more the rule than the exception. Indeed, when I asked the informant to come up with some, she had a difficult time of it.

The final constraint-ranking, therefore, should be the following:

*Lar & NoCoda, Max, OO-Faith Ordering >> OO-Faith Order >> OO-FaithV, Ident [voi] >> AlignTenseL, NoCoda, Dep >> AlignNegL >> AlignPronL, Onset.

(8) Phonological behaviour

In my paradigms included in the paper, I have used only verbs whose vowels are [+ATR]. Luo undergoes a process of vowel harmony, whereby ATR features are spread from roots to affixes. I chose [+ATR] vowels to make my transcriptions easier for this paper, since my primary focus has been on ordering and not on the phonological behaviour of vowels. There also seems to be some other things going on. In some cases, the mid-vowels [e] and [o] appears to alternate with the high, [-ATR] vowels [w] and [•]. This is particularly true at the end of words and in the environment of other high vowels. I have also noted that there is some loss of contrast between [-ATR] and [+ATR] vowels before nasals and at the ends of words. What the details of the alternations are I have not completely determined yet, but they do impact on the vowels, particularly in my transcriptions of the pronominal prefixes in the conjugations of [ndiko], and with the final [-o]'s of some of the verbs. These alternations will have to be accounted for at another time. I will also note here, that there is a process of optional glottalization when a voiceless stop precedes a voiced one within a word. It may be a reflex of cutting on the voicing suddenly within a stop-stop sequence, particularly when the stops are of the same place of articulation. I have transcribed it in the paradigms in the appendix as an apostrophe.

The second-person pronouns will also behave like glides when it falls in front of a vowel-initial verb, especially one that is non-high. I have not included any of the relative paradigms here.

(9) Remote vs. Immediate Past

There is another tense distinction that is marked in Luo that is not determined by segmental morphology. The remote vs. immediate past distinction is marked by tone alone. The final {-o} of the verb stem is low in both cases, with the remote past carrying a high tone on the verb root and all preceding syllables, while the immediate past has a falling-rising tone that is spread backward over the verb and its affixes; the more syllables, the more rises and falls. This is also seemingly consistent between the plain past remote vs. immediate past distinction and the pluperfect remote vs. immediate past distinction.

(10) Additional forms for which I have incomplete paradigms

The data I have gathered so far is far from an exhaustive account of the verb forms in Luo. I have given here below some of the additional information I've gathered related to this topic.

A. Imperative (let G be the velar nasal)

write!   ndik!   look!   Gi!
write! (pl.)   ndiku:ru!   look! (pl.)   Giu:ru!

B. Passive

The book was read.   buk nosesom.   The book was sold.   buk nous.

C. Past conditional (?)

I might have shouted   dinagokoko

D. To be able

I can/could shout   anyana gokoko

E. Transitive vs. intransitive

to eat (something)   chamo   to eat   chiemo

F. Repeated action

look repeatedly/a long time   GichaGicha
sit repeatedly   betabeta

G. Past possibility?

I might have sold the book;

it could be possible that I sold the book.   nyalo bet nnauso buk.

H. Present causative

I make him write   ami ondiko   I make him sell   ami ouso
we make him write   wami ondiko   we make him sell   wami ouso

I. Past causative negative

I don't make him write   okami ondik
we don't make him write   okwami ondik

(11) Course of future research

This account of verb morphology in Luo is far from complete, but it does yield some testable results. There are a number of other tenses and aspects to inquire about that will demonstrate the validity or falsehood of the claims I've made. Some of the additional tenses/aspects to ask about include: habitual aspect; tenses with the copula; past conditional; and negatives for many of the forms I have already collected. I will also need to complete the paradigms for which I have only partial information. I am also curious to know if infinitives in Luo can be marked for tense, and whether pronouns are always preserved in the third person constructions for which the morpheme is buried within the verbal complex, and how the behaviours of emphatic construction. I would also like to see if there is a regular correlation between vowel-alternations and transitive-intransitive pairs.

(12) Appendix

Below are the complete paradigms available for all the conjugations included in this paper.

A. Future

I will write   abondiko   I will study   abosomo
you will write   ibondiko   you will study   ibosomo
he/she will write   obondiko   he/she will study   obosomo
we will write   wabondiko   we will study   wabosomo
you (pl.) will write ubondiko   you (pl.) will study ubosomo
they will write   gibondiko   they will study   gibosomo

B. Perfect tense/aspect

I have written	asendiko		I have studied	asesomo
you have written	isendiko		you have studied	isesomo
he/she has written	osendiko		he/she has studied	osesomo
we have written	wasendiko		we have studied	wasesomo
you (pl.) have written	usendiko		you (pl.) have studied	usesomo
they have written	gisendiko		they have written	gisesomo

C. Present subjunctive

I should write	onegandik		I should study	onegasom
you should write	onegindik		you should study	onegisom
he/she should write	onegondik		he/she should study	onegosom
we should write	onegowandik		we should study	onegowasom
you (pl.) should write	onegoundik		you (pl.) should study	onegousom
they should write	onegogindik		they should study	onegogisom

D. Present optative

I may write	dipopandiko		I may study	dipopasomo
you may write	dipopindiko		you may study	dipopisomo
he/she may write	dipopondiko		he/she may study	dipoposomo
we may write	dipopwandiko		we may study	dipopwasomo
you (pl.) may write	dipopundiko		you (pl.) may study	dipopusomo
they may write	dipopgindiko		they may write	dipopgisomo

E. Conditional

I would write	dandiko		I would study	dasomo
you would write	dindiko		you would study	disomo
he/she would write	dondiko		he/she would study	dosomo
we would write	dewandiko		we would study	dewasomo
you (pl.) would write	deundiko		you (pl.) would study	deusomo
they would write	degindiko		they would study	degisomo

F. Jussive

let me write!	andik!		let me study!	asom!
write (?)	(indik!)		study! (?)	(isom!)
let him/her write!	ondik!		let him/her study!	osom!
let us write!	wandik!		let us study!	wasom!
write! (pl.)	undik!		write! (pl.)	usom!
let them write!	gindik!		let them study!	gisom!

G. Past Perfect/Pluperfect

I had written	nasendiko	I had studied	nasesomo
you had written	nisendiko	you had studied	nisesomo
he/she had written	nosendiko	he/she had studied	nosesomo
we had written	newasendiko	we had studied	newasesomo
you (pl.) had written	neusendiko	you (pl.) had studied	neusesomo
they had written	negindiko	they had studied	negisomo

H. Past Subjunctive

I should have written	nonegandik	I should have sold	nonegaus
you should have written	nonegindik	you should have sold	nonegius
he/she should have written	nonegondik	he/she should have sold	nonegous
we should have written	nonegowandik	we should have sold	nonegowaus
you (pl.) should have written	nonegoundik	you (pl.) should have sold	nonegou:s
they should have written	nonegogindik	they should have sold	nonegogius

I. Present negative

I don't write	okandik	I don't study	okasom
you don't write	okindik	you don't study	okisom
he/she doesn't write	okondik	he/she doesn't study	okosom
we don't write	okwandik	we don't study	okwasom
you (pl.) don't write	okundik	you (pl.) don't study	okusom
they don't write	ok'gindik	they don't study	ok'gisom

J. Future negative

I will not write	okabendiko	I will not sell	okabeuso
you will not write	okibendiko	you will not sell	okibeuso
he/she will not write	okobendiko	he/she will not sell	okobeuso
we will not write	okwabendiko	we will not sell	okwabeuso
you (pl.) will not write	okubendiko	you (pl.) will not sell	okubeuso
they will not write	ok'gibendiko	they will not write	ok'gibeuso

K. Past negative

I didn't write	nokandiko	I didn't sell	nokauso
you didn't write	nokindiko	you didn't sell	nokiuso
he/she didn't write	nokondiko	he/she didn't sell	nokouso
we didn't write	nokwandiko	we didn't sell	nokwauso
you (pl.) didn't write	nokundiko	you (pl.) didn't sell	noku:so
they didn't write	nok'gindiko	they didn't sell	nok'giuso

L. Imperative/Jussive negative

don't let me write!   kikandik!
don't write!   kikindik!
don't let him/her write!   kikondik!
don't let us write!   kikwandik!
don't write! (pl.)   kikundik!
don't let them write!   kik'gindik!

References:

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  - Biddulph, Joseph. 1985. An introduction to Luo, a Nilotic language of Kenya (with remarks on Acoli). Wales: Joseph Biddulph Publisher.

    Harris, John. 1998. The right edge of word and the left edge of syllables. Handout from paper given at NSF Workshop: Syllable Structure and Gesture Timing, LP98, Columbus, Ohio.

    Okoth-Okombo, Duncan. 1982. DhoLuo morphophonemics in a generative framework. Berlin: Reimer.

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