

Chapter 9

Multiple exponence in the Lusoga verb stem

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In this paper we address an unusual pattern of multiple exponence in Lusoga, a Bantu language spoken in Uganda, which bears on the questions of whether affix order is reducible to syntactic structure, whether derivation is always ordered before inflection, and what motivates multiple exponence in the first place. In Lusoga, both derivational and inflectional categories may be multiply exponed. The trigger of multiple exponence is the reciprocal suffix, which optionally triggers the doubling both of preceding derivational suffixes and of following inflectional suffixes. In these cases, each of the doubled affixes appear both before (closer to the root) and after the reciprocal. We attribute this pattern to restructuring, arguing that the inherited Bantu stem consisting of a root + suffixes has been reanalyzed as a compound-like structure with two internal constituents, the second headed by the reciprocal morpheme, each potentially undergoing parallel derivation and inflection.

1 Introduction

Among the most important contributions of Steve Anderson's realizational approach to morphology have been his early insistence that morphology is not reducible to syntax, his argument that formal theoretical models of morphology need to take different approaches to derivation and inflection ("split morphology"), his development of morphological rule ordering as the mechanism of ordering affixes, and his postulation that redundant (inflectional) morphological exponence is actively avoided by grammars. According to Anderson (1992), derivational morphology takes place in the lexicon, while

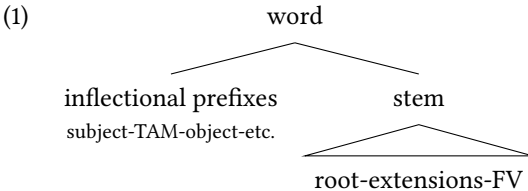


inflectional morphology takes place in the syntax. Inflectional morphology is realized by the application of ordered rules which spell out features supplied by syntactic principles such as agreement. The best evidence that the ordering of inflectional affixes cannot simply be read off of syntactic structure comes from morphotactics which have no analogue or simple justification in syntax.

In this paper we address some rather unusual facts from Lusoga, a Bantu language spoken in Uganda, which bear on the questions of whether affix order is reducible to syntactic structure, and whether derivation is always ordered before inflection, particularly as concerns multiple exponence. In §2 we introduce the Bantu verb stem and briefly summarize what has been said about the ordering of derivational suffixes within it. After reviewing the findings that much of this ordering is strictly morphotactic, not following from syntactic scope or semantic compositionality, in §3 we discuss multiple exponence among the Lusoga derivational verb extensions. In §4 we then turn to the original contribution of Lusoga, which shows multiple exponence of inflectional agreement as well as unexpected intermingling of inflectional and derivational affixation. We present our analysis in §5 and conclude with a few final thoughts in §6.

2 The Bantu verb stem

Most overviews of the Bantu verb stem assume a structure with an obligatory verb root followed by possible derivational suffixes (“extensions”), and ending with an inflectional final vowel (FV) morpheme. As shown in (1), the verb stem may in turn be preceded by a string of inflectional prefixes to form a word:



While this structure has been reconstructed for Proto-Bantu (Meeussen 1967), there is much variation on how the different derivational “verb extensions” are ordered. As shown in Hyman (2003b), most Bantu languages show at least a tendency to favor the “CARP” template in (2), for which we give reflexes in several Bantu languages:

(2)	C(ausative)	A(pplicative)	R(eciprocal)	P(assive)
Shona	-is-	-il-	-an-	-w-
Makua	-ih-	-il-	-an-	-iw-
Chichewa	-its-	-ir-	-an-	-idw-
Lusoga	-is-	-ir-	-agan-	-(ib)w-
Proto-Bantu	*-ic-	*-id-	*-an-	*-iC-ʊ-

The arguments for recognizing the CARP template include the following:

(i) Certain pairs of co-occurring suffixes must appear in a fixed surface order. This is true of the causative + applicative (CA), which can co-occur only in this order, independent of their relative scope. Compare the following two examples from Chichewa, in which applicative *-ir-* introduces an instrument (Hyman & Mchombo 1992; Hyman 2003b). Scope (schematized on the right) varies across the two examples, but surface order is the same:

- (3) a. applicativized causative:
 lil-its-ir- ‘cause to cry with’ [[cry] -cause-with]
 b. causativized applicative:
 takas-its-ir- ‘cause to stir with’ [[stir-with] -cause]

(ii) Non-templatic orders which are driven by scope can occur with certain sets of suffixes, but are typically limited and show a “compositional asymmetry”: The a-templatic order is restricted to the reading in which the surface order corresponds to relative scope, while the templatic order can be interpreted with either possible scope relations (e.g. reciprocalized causative, causativized reciprocal). The two orders of causative and reciprocal (CR, RC) illustrate this property in (4), again from Chichewa:

- (4) a. templatic CR:
 mang-its-an- ‘cause each other to tie’ [[tie] -cause-e.o.]
 ‘cause to tie each other’ [[tie-e.o.] -cause]
 b. a-templatic RC:
 mang-an-its- ‘cause to tie each other’ [[tie-e.o.] -cause]
 *‘cause each other to tie’

As seen in (4a), the templatic CR order allows either scope interpretation, while the a-templatic RC order in (4b) can only be used to express a causativized reciprocal. The same facts are observed in cases where the a-templatic order of applicative and reciprocal is reinforced by an A-B-A “copied” sequence:

- (5) a. templatic AR:
 mang-ir-an- ‘tie (sth.) for each other’ [[tie] -for-e.o.]
 ‘tie each other for (s.o.)’ [[tie-e.o.] -for]
 b. a-templatic RAR:
 mang-an-ir-an- ‘tie each other for (s.o.)’ [[tie-e.o.] -for]
 *‘tie (sth.) for each other’

Again, as seen in (5a), the templatic AR order can have either scope (reciprocalized applicative, applicativized reciprocal), while in (5b) the a-templatic (RA) + copy (R) sequence can only be compositional, hence an applicativized reciprocal. (We will see such A-B-A sequences in Lusoga in §3.)

(iii) A third argument for CARP is that at least one language, Chimwiini, allows only this order, whereas no Bantu language allows verb extensions to be freely ordered by scope. Thus, Abasheikh (1978: 28) writes:

“In Chimwi:ni, unlike some other Bantu languages, the order of the extensions is restricted. The following ordering of the extensions mentioned above is as follows: - Verb Stem - Causative - Applied - Reciprocal - Passive. It is not possible to put these extensions in any other order.”

Other than stative *-ik-*, which is more restricted in its co-occurrence with other suffixes, the above summarizes the general picture for the productive extensions which are involved in valence. Even given the occasional variations, e.g. Kitharaka (Muriungi 2003), which reverses the applicative and reciprocal, hence the order CRAP, the evidence points unequivocally to the fact that extension order is determined primarily by template.

The importance of templaticity is also seen from the existence of one other valence-related suffix, the short causative *-i-* (I) which typically occurs between the reciprocal and passive, hence CARIP (see also Bastin 1986, Good 2005). Although both **-ic-* (> *-is-*, *-is-*) and **-i-* were present in Proto-Bantu, **-ic-* occurred only in combination with **-i-*, hence **-ic-i-* (cf. Bastin (1986). However, as summarized in (6), the current distribution of the two extensions (as well as the productivity of *-i-*) varies considerably across different Bantu languages (Hyman 2003b: 261):

- | | | | |
|-----|----|----------------------------------|----------------------------|
| (6) | a. | <i>-is-i-</i> and <i>-i-</i> | : Kinande, Luganda, Lusoga |
| | b. | <i>-is-</i> only | : Chichewa, Shona, Zulu |
| | c. | <i>-i-</i> only (or almost only) | : Nyamwezi, Nyakyusa |

The fact that *-is-* is the linearly first extension and *-i-* a quite later extension in CARIP, for reasons not motivated by scope, presents one more reason to accept a templatic, rather than compositional approach to Bantu verb extensions. However, this conclusion is not without interesting complications. As shown in such studies as Hyman (1994; 2003a) and Downing (2005), *-i-* frequently produces frication of a preceding consonant (a.k.a. Bantu spirantization) with potential multiple (cyclic) effects, as seen from the following examples in which *-i-* co-occurs with the (non-fricativizing) applicative *-il-* suffix in (7) from Cibemba:

- | | | | | | |
|-----|------------------|---------------|------------------|-------------------|----------------|
| (7) | <i>lub-</i> | ‘be lost’ | <i>lil-</i> | ‘cry’ | UR |
| | <i>lub-i-</i> | ‘lose’ | <i>lil-i-</i> | ‘make cry’ | Morphology (I) |
| | <i>luf-i-</i> | | <i>lis-i-</i> | | Phonology |
| | <i>luf-il-i-</i> | ‘lose for/at’ | <i>lis-il-i-</i> | ‘make cry for/at’ | Morphology (A) |
| | <i>luf-is-i-</i> | | <i>lis-is-i-</i> | | Phonology |

In both outputs, the applicative and short causative exhibit the expected surface AI order. However, the frication of *lub-* ‘be lost’ and *lil-* ‘cry’ to *luf-* and *lis-* suggests that at some level of representation, *-i-* is root adjacent. Hyman (1994) adopts the above cyclic analysis in which morphology and phonology are interleaved (see e.g. Kiparsky 1982): *-i-* combines with the root on the first morphological cycle, triggering a phonological application of frication on the root. When the applicative is added on the next cycle of morphology, it is “interfixed” between the root and the short causative, in conformity

with the AI order required by the CARIP template. This example illustrates the surface nature of the template.

Although it is not part of the CARIP template of valence-changing derivational suffixes, the “final vowel” (FV) inflectional ending position is also templatic in that it is required in most Bantu languages. The set of suffixes that may appear in the FV position includes past tense **-I-*, subjunctive **-ε*, and (in most other contexts) default **-a*. The *-ε* portion of perfective **-il-ε*, which we will encounter in §4, is also in this slot, even as the *-il-* portion is sometimes considered to be part of the extension system. The customary reason for assuming bimorphemic **-il-ε* is that the short causative (I) and passive (P) occur between the two parts, hence **-il-i-ε* and **-il-u-ε* (Bastin 1983). If we assumed that **-il-ε* was monomorphemic, we would have to assume some kind of exfixation or metathesis of the causative and passive with the [il] portion of *-ile*. There is a second argument from Lusoga (and Luganda): Whenever causative *-i-* or passive *-u-* is present, the FV of the perfective complex is *-a* (see (9) and note 5 below). We assume that *-il-* occurs in the template ordered before *-I-P-* with the function of perfectivizing the extended derivational base so it can accept *-ε* or *-a* (cf. §4.) With this established, we are ready to go on to the issues that arise in Lusoga.

3 Lusoga verb extensions

As mentioned above, Lusoga is spoken in Uganda and is the Bantu language most closely related to Luganda. The data cited in this study were contributed by Fr. Fred Jenga, a native speaker from Wairaka (Jinja District).

3.1 Long and Short Causatives

Lusoga exhibits the CARIP template discussed above, where C refers to the long causative *-is-* and I refers to the short causative extension *-i-*. In fact, Lusoga uses both *-is-i-* and *-i-* productively and often interchangeably, to express both causation and instrumentals: *-lim-is-i-*, *-lim-i-* ‘cause to cultivate, cultivate with (sth.)’. As indicated, *-is-* cannot occur without *-i-*, while the reverse is possible. The two causative morphs are quite consistent in their CARIP templatic ordering with respect to the applicative, namely, *-is-il-i-* (CAI), *-il-i-* (AI), which are realized as *-is-iz-* and *-iz-* by the following processes:

- (8) ‘make cultivate for/at’
- | | | |
|---------------|------------|------------------|
| lim-is-il-i-a | lim-il-i-a | UR |
| lim-is-iz-i-a | lim-iz-i-a | frication |
| lim-is-iz-y-a | lim-iz-y-a | gliding |
| lim-is-iz-a | lim-iz-a | glide-absorption |

3.2 Reciprocal + Short Causative

Challenges to the CARIP template arise with the reciprocal suffix, which in Lusoga has the long reflex *-agan-* of Proto-Bantu **-an-*.¹ In the next few subsections we will consider how the reciprocal combines with its fellow extensions in the CARIP template, including both ordering flexibility as well as affix doubling.

We begin with the short causative, *-i-*. When used alone, without the long causative, we observe flexible ordering possibilities, well beyond what would be expected from the CARIP template. In these and subsequent examples, a left bracket indicates the boundary between inflectional prefixes and the beginning of the verb stem:

- (9) ‘they make each other sew’
 a. bà-[tùùng-ágán-y-á /tùùng-agan-i-a/ RI
 b. bà-[tùùnz-ágán-á /tùùng-i-agan-a/ IR
 c. bà-[tùùnz-ágán-y-á /tùùng-i-agan-i-a/ IRI

In none of (9a-c) does the short causative *-i-* surface as a vowel. Nonetheless, its presence is clearly felt. In (9a) it glides, preceding a following vowel; in (9b) and (9c) it spirantizes the final /g/ of *-tùùng-* ‘sew’ to [z] by a general process in the language, and is otherwise deleted before the following vowel (of the reciprocal). The reciprocal suffix *-agan-* does not trigger compensatory lengthening when vowels glide or delete before it, as also seen in the examples with root-final vowels immediately followed by *-agan-*, below:

- (10) a. bà-[mw-ágán-á ‘they shave each other’ /-mo-/ ‘shave’
 b. bà-[ty-ágán-á ‘they fear each other’ /-tì-/ ‘fear’

Note that (9c) appears to exhibit *two* instances of the short causative: root spirantization indicates a following short causative, and the glide following the reciprocal also indicates a following short causative. These two surface reflexes of the short causative could result from input suffix doubling, something that is attested elsewhere in Lusoga, as shown in the UR given for (9c). Alternatively, the double reflex of the short causative could be the result of a-templatic IR order, in which the single short causative spirantizes the root and then the reciprocal is interfixed inside of it, an analysis Hyman has supported for Chibemba (7). On this account, short causative doubling (IRI) is illusory. We leave open for now whether the IRI ordering is required; what is clear is that both RI and IR are possible.

3.3 Reciprocal + Long Causative

We turn next to the long causative *-is-*, which, as we have seen, must co-occur with the short causative *-i-*. The most common realization when reciprocal and long causative

¹ While it is marginally possible for the reciprocal and passive to co-occur in some Bantu languages, typically with an impersonal subject, e.g. Ndebele *kw-a-sik-w-an-a ~ kw-a-sik-an-w-a* ‘there was stabbing [stabbed] of each other’ (Sibanda 2004: 66), we have thus far not been able to get the two to co-occur in Lusoga and will therefore ignore the passive extension in what follows.

are both present is for *-agan-* to appear between *-is-* and *-i-*, as in (11a), exhibiting the CRI order expected given the CARIP template. However, two other surface realizations are also possible:²

- (11) ‘they make each other sew’
- | | | | |
|----|-----------------------|---------------------|-----|
| a. | bà-[tùùng-ís-ágán-y-á | /tùùng-is-agan-i-a/ | CRI |
| b. | bà-[tùùng-ís-ágán-á | /tùùng-is-i-agan-a/ | CIR |
| c. | bà-[tùùng-ágán-ís-á | /tùùng-agan-is-i-a/ | RCI |

In (11b), *-agan-* follows *-is-i-* (CIR). In (11c) *-agan-* precedes *-is-i-* (RCI). This variation reveals the same freedom with respect to the ordering of the long causative and reciprocal extensions that we observed in §3.2 with respect to the ordering of the short causative and reciprocal extensions.

Note that for phonological reasons, it is impossible to distinguish between the inputs *-is-* and *-is-i-* before *-agan-*. The reason is that, sandwiched between long causative *-is-* and following vowel-initial *-agan-*, short causative *-i-* would glide to *-y-* and then get absorbed into the preceding [s], without leaving a trace. As was seen in (10), compensatory lengthening is not expected before *-agan-*. However, it can be detected between *-i-* and a FV when an enclitic such as locative class 17 *=kò* ‘on it, a little’ is added:

- (12) ‘they make each other sew a little’
- | | | | |
|----|----------------------------|---------------------------|-------------|
| a. | bà-[tùùng-ís-ágán-y-áá =kò | /tùùng-is-i-agan-i-a =kò/ | CIRI + encl |
| b. | bà-[tùùng-ís-ágán-á =kò | /tùùng-is-i-agan-a =kò/ | CIR + encl |
| c. | bà-[tùùng-ágán-ís-áá =kò | /tùùng-agan-is-i-a =kò/ | RCI + encl |

In (12a), the final length on *-aa* can be directly attributed to the gliding of the preceding *-i-*, since there is a surface [y], as can be the final length in (12c), where the glide has been absorbed into the preceding [s]. Although (12b) does not show a surface reflex of the internal *-i-*, we continue to assume that *-is-* must be accompanied by *-i-*, as also reconstructed for Proto-Bantu (Bastin 1986).

While there are three possible realizations when reciprocal *-agan-* combines with the long and short causative suffixes, the preferred surface orders are IRI in (9c), and CRI, in (11a). RI and CIR are of course predicted straightforwardly from CARIP, while the IR of IRI is not. Both early placement of C (*-is-*) in the CARIP template and the early realization of the first *-i-* of the hypothesized a-templatic IRI ordering discussed in this section are consistent with a generalization that Hyman (2003b: 272) has characterized as “causativize first!”: Both *-is-* and *-i-* are spelled out early, but later affixation may result in two surface reflexes of *-i-*, either because of interfixation of subsequently added extension suffixes or because of outright morphological *-i-* doubling of the kind seen in the Chichewa RAR case illustrated in (5b).

² Since Lusoga has a /L/ vs. Ø tone system (Hyman 2016), only L(ow) vowels are marked with a grave accent in underlying forms. Vowels without an accent receive their surface tones by specific rules. H(igh) tone is marked with an acute in output forms.

3.4 Reciprocal + Applicative

The CARIP template is complicated further by the behavior of the applicative, represented by “A” in CARIP. In all three of the following examples, the transitive verb *kùb* ‘beat’ is both reciprocalized ‘beat each other’ and applicativized. Applicative *-ir-* licenses a locative argument, expressed by the enclitic *=wà* ‘where’. Here again we observe alternative affix orders:

- (13) ‘where do they beat each other?’
- a. *bà-[kùb-ír-ágán-á =wà* AR
 - b. *bà-[kùb-ágán-ír-á =wà* RA
 - c. *bà-[kùb-ír-ágán-ír-á =wà* ARA

(13a) represents the expected AR order of CARIP, while the RA order of (13b) represents an order which is closer to the compositional interpretation of the resulting verb. In (13c) *-ir-agan-ir-* has both the AR and RA orders. The variation between AR, RA and ARA orders represents a competition between the demand of the CARIP template for one order and the requirement for affixes to appear in a surface order that reflects their relative scope. The AR order (13a) is templatic; the RA order in (13b) is a scope-based or compositional override. As suggested by Hyman (2003b), ABA affix doubling can thus be interpreted as a means of satisfying both template and compositionality considerations; if the template wants AR and scope wants RA, then ARA, in some manner, satisfies both.³

An illustrative pair of examples is presented in (14), based on the transitive verb *bal* ‘count’, which is reciprocalized and applicativized. In this instance, applicative *-ir-* licenses a benefactive object:

- (14) a. *bà-bi-[bál-ír-ágán-á* AR ‘they count them [inanimate class 8] for each other’
- b. *bà-tù-[bál-ír-ágán-á* AR ‘they [animate] count each other for us’ ~ ‘they count us for each other’

By varying the animacy of the object pronouns in (14), it is possible to bias the scope interpretation of reciprocal and applicative in opposite directions. In (14a) the object prefix *-bi-* ‘them’ (class 8) represents an inanimate object such as *èbitabo* ‘books’ or *èbikopò* ‘cups’, hence animate ‘each other’ (referring back to *bà-* ‘they’) claims the benefactive rôle over inanimate *-bi-* ‘them’. In this sentence the AR order *-ir-agan-* satisfies both the CARIP template and scope: [[count them] for each other]. In (14b), animate first person object *-tù-* ‘us’ preferentially claims the benefactive role over third person *-agan-*, again

³ The questions in (13) unambiguously ask where the action took place and could therefore be answered “in Jinga” or “in the house”. The absence of the applicative in the corresponding question *bà-[kùb-agan-a =wà* ‘where do they beat each other?’ more narrowly asks what spot or area of the body was hit. An appropriate answer would therefore be “on the head”. Finally, the double reflex of applicative *-ir-* of ARA *-ir-agan-ir-* in (13c) is reminiscent of the double reflex of RAR *-an-ir-an-* in Chichewa in (5c): the sequence *-ir-agan-* is licensed by CARIP, while *-agan-ir-* represents the scope override. Concerning ABA suffix ordering, one might note that Lusoga (13c) violates Hyman’s 2003 generalization, observable in Chichewa (5c), that AB always reflects the scope, while BA is templatic.

referring back to *bà-* ‘they’. The *-ir-agan-* order in this sentence is also templatic, but this time need not reflect scope: Although the preferred interpretation is [[count each other] for us], the other scope ([[count us] for each other]) is also possible, though pragmatically less likely. It is thus not surprising that the two alternatives are also possible in (15) with the same meaning:

- (15) ‘they [animate] count each other for us’
 a. *bà-tù-[bál-ágán-ír-a]* RA
 b. *bà-tù-[bál-ír-ágán-ír-á]* ARA

Parallel to (12b,c), (15a) is a scope override, while *-ir-agan-ir-* satisfies both CARIP and scope in (15b). What is surprising is that the same possibilities are at least marginally acceptable in (16), both sentences having the same meaning.

- (16) ‘they count them [inanimate cl. 8] for each other’
 a. *bà-bi-[bál-ágán-ír-á]* RA
 b. ??*bà-bi-[bál-ír-ágán-ír-á]* ARA

As in (15a,b), the RA sequence occurs perfectly well in (16a), while the doubled RAR sequence in (16b) was judged as sounding “Lugandish,” perhaps OK to use, but seems a little funny, “like a foreigner learning Lusoga.” While we have an explanation for the variation in (13b,c) and (15a,b), neither CARIP nor scope predicts that (16a,b) should be possible. We thus arrive at a major divergence from the template + scope approach that accounts for the variations considered above in Lusoga, as well as Chichewa, Chibemba, and other Bantu languages. We now address why this may be so in the next section.

4 Inflectional FV suffixes in Lusoga

In §3 we were largely able to account for surface variations in verb extension order in Lusoga by appealing to a tradeoff between the CARIP template and scope considerations: While the templatic CARIP is always available and represents the default order of affixes, conflicting orders may be licensed by scope, and template-scope interactions can even result in ABA sequences. The one major exception concerns cases of atemplatic (A)RA *-(ir)-agan-ir-*, in which a-templatic RA *-agan-ir-* cannot be said to be a compositional override. In this section we show that this unexpected ordering likely owes its existence to an optional restructuring of reciprocal *-agan-*.

To illuminate this hypothesis, we now turn to the interaction of reciprocal *-agan-* with the set of complementary inflectional “final vowel” (FV) suffixes. Every verb must end in one of these. While most verbs end in the default FV *-a*, specific TAM categories require one of two other finals, the FV *-e* or the FV complex *-ir-e*, which have the following distributions:

- (17) a. “irrealis” -e : hortative/subjunctive, affirmative imperative singular
with an object prefix, affirmative imperative plural,
negative near future (F1)
b. “perfective” -ir-e : perfect/today past (P1), yesterday past (P2)
c. “default” -a : elsewhere

As summarized in (17a) and exemplified in (18), what unifies the uses of *-e* is its use in a subset of irrealis constructions:

- (18) a. bì-[bál-è ‘count them!’ (singular imperative with an object
prefix; cf. bàl-à ‘count!’)
b. mù-[bál-è ‘count (pl.)!’ (plural imperative)
c. tù-[bál-è ‘let’s count!’ (hortative/subjunctive)
d. tì-bá-á-[bál-è ‘they will not count’ (negative near future F1)

As per the general Bantu stem structure in (1), the FV follows the verb extensions, e.g. applicative *-ir-* in (19).

- (19) a. bì-tù-[bàl-ír-è ‘count them for us!’
b. mù-tù-[bàl-ír-è ‘count (pl.) for us!’
c. tù-bà-[bàl-ír-è ‘let’s count for them!’
d. tì-bá-á-tù-[bàl-ír-é ‘they will not count for us’

However, two options are attested when the extension is *-agan-*:

- (20) a. mù-[bàl-ágàn-é ‘count each other!’
tù-[bàl-ágàn-é ‘let’s count each other!’
tì-bá-á-[bàl-ágàn-é ‘they will not count each other’
b. mù-[bàl-é-gàn-é ‘count (pl.) each other!’
tù-[bàl-é-gàn-é ‘let’s count each other!’
tì-bá-á-[bàl-é-gàn-é ‘they will not count each other’

The expected forms are in (20a), where reciprocal *-agan-* is followed by FV *-e*. Surprisingly, the alternatives in (20b) show the FV *-e* occurring both before and after the reciprocal. In these forms we have segmented off the first FV as *-e-*, which means that the reciprocal allomorph is *-gan-* in this context. The alternative would be to recognize a reciprocal allomorph *-egan-* which is used whenever there is an upcoming FV *-e*.⁴ We will see in the discussion of perfective *-ir-e* below that the first *-e-* is correctly interpreted as a copy agreeing with the final *-e*.

The same variation obtains when the applicative suffix is present:

⁴ It is important to note that *-e-gan-* cannot be used if the FV is *-a*: ò-kú-[bàl-ágàn-á ‘to count each other’, bà-[bàl-ágàn-á ‘they count each other’ vs. *ò-kú-[bàl-é-gàn-á, *bà-[bàl-é-gàn-á.

- (21) a. mù-bì-[bál-ìr-àgàn-é] ‘count (pl.) them for each other!’
 tù-bì-[bál-ìr-àgàn-é] ‘let’s count them for each other!’
 tì-bá-á-bí-[bál-ìr-àgàn-é] ‘they will not count them for each other!’
 b. mù-bì-[bál-ìr-è-gàn-é] ‘count (pl.) them for each other!’
 tù-bì-[bál-ìr-è-gàn-é] ‘let’s count them for each other!’
 tì-bá-á-bí-[bál-ìr-è-gàn-é] ‘they will not count them for each other!’

In (21), the applicative *-ir-* precedes the reciprocal, showing the AR order predicted by the CARIP template, but the presence of the FV between the two in the forms in (21b) is highly unusual from a Bantu point of view.

Exactly the same phenomenon of FV doubling occurs with the perfective *-ir-e* FV complex. As in Luganda, Lusoga *-ir-e* has several allomorphs. These are presented in (22) in the form they take prior to the application of phonological rules:⁵

- (22) a. *-ir-e* : after a CV- verb root
 b. *-i- ... -e* : when fused (“imbricated”) into a longer verb base
 c. *-i-e* : after a labial consonant and /n/
 d. *-i-e* : after a fricated consonant [s] or [z], where *-i-* → *y* → ∅

The above four allomorphs are illustrated in the perfect/today past (P1) tense below:

- (23) a. /tù-[tì-ir-e/ → tù-[tì-ìr-é] ‘we feared’
 b. /tù-[tomer-i-e/ → tù-[tómèir-é] ‘we ran into (s.o./sth.)’
 c. /tù-[tùm-i-e/ → tù-[tùm-y-é] ‘we sent’
 d. /tù-[bal-i-e/ → tù-[báz-è] ‘we counted’

In (23a), the */-ir-e/* allomorph is realized after the CV verb */-tì-/* ‘fear’. In (23b), longer verb bases that end in a coronal consonant undergo imbrication whereby *-i-* metathesizes with the consonant. We will see in further examples that the reciprocal *-agan-* extension also undergoes imbrication to become *-again-e*. In (23c), the */-i-/* of */-i-e/* glides to [y].⁶ In (23d), *-i-* fricates the preceding /l/ to [z], yielding the same derivation as in (8): */-bal-i-e/* → *baz-i-e* → *baz-y-e* → *baz-e*, the [y] being absorbed into the preceding fricative.

We will now illustrate each of the above allomorphs of *-ir-e* in (23) as they are realized with the reciprocal extension. We start with the reciprocalized version of (23b), which exhibits the imbricating *-i-e* perfective FV allomorph. The historically conservative variant, in which the root is followed directly by the reciprocal suffix and then the *-i-e* FV, is

⁵ As was discussed at the end of §2 with respect to Proto-Bantu, we represent *-ir-e* as bimorphemic. In (22) we omit the passive and causative forms that occur with final *-a*, thereby providing even more allomorphs, e.g. the perfective of the lexicalized passive verb */-lùm-u-/* ‘be in pain’ is *tù-[lùm-íir-w-à]* ‘s/he was in pain’, while the perfect of the lexicalized causative verb */-tèm-i-/* ‘blink’ is *tù-[tèm-íiz-à]* ‘we blinked’, where *r* → *z* is triggered by the causative suffix */-i-/*. Both occur with a long *-iir-* morph followed by *-a*. As seen in these examples, the fact that *-a* is used with passive *-u-* and causative *-i-* provides additional evidence that *-ir-* is a separate morpheme from *-e* or *-a*.

⁶ The following *-e* actually lengthens, but then is shortened by a rule of final vowel shortening (FVS), which converts *à-lím-y-èè* to *à-lím-y-è*. Thus compare the long vowel in *à-[lím-y-[↓]éé = kò]* which is realized when an enclitic follows. ([↓] indicates a downstepped high tone).

shown in (24a). However, the preferred alternative is (24b), in which the perfective *-i-e* appears, imbricated, both immediately following the root AND immediately following the reciprocal. URs showing both a single and a doubled FV complex are provided for each form:

- (24) ‘we ran into each other’
 a. /tù-[tomer-agan-i-e/ tù-[tómèr-àgàin-é
 b. /tù-[tomer-i-e-agan-i-e/ tù-[tómèir-è-gàin-é

A parallel situation obtains in (25), which corresponds to (23c):

- (25) ‘we sent each other’
 a. /tù-[tùm-agan-i-e/ tù-[tùm-àgàin-é
 b. /tù-[tùm-i-e-agan-i-e/ tù-[tùm-y-è-gàin-é

Example (26), based on (23d), shows similar facts, the main difference being the frication triggered by causative *-i-* on the verb root *-bal-* ‘count’:

- (26) ‘we counted each other’
 a. /tù-[bal-agan-i-e/ tù-[bál-àgàin-é
 b. /tù-[bal-i-e-gan-i-e/ tù-[báz-è-gàin-é

Finally, in (27), we see a reciprocalized version of the root in (23a), which, on its own, would take the *-ir-e* FV allomorph. The historical variant is shown in (27a), but the preferred variant, with doubled FV, is given in (27b):

- (27) ‘we feared each other’
 a. /tù-[tì-agan-i-e/ tù-ty-àgàin-é
 b. /tù-[tì-ir-e-gan-i-e/ tù-tì-ir-è-gàin-é

As before there are two instances of the perfective in (27b), vs. one in (27a). In this case of doubling, however, the allomorphy of the perfective is different in the two copies. The first copy of the FV follows a CV root and assumes the expected *-ir-e* form; the second copy, following the longer *-agan-*, assumes the imbricating *-i-e* form. The fact that the allomorphs are different suggests that the two copies are generated independently.

In sum, both the irrealis *-e* FV and the perfective FV allomorphs can appear once in a reciprocalized verb, or twice, with the double spell-out being clearly preferred. We now turn to an analysis of these facts in §5.

5 Towards an analysis

From the perspective of familiar cross-linguistic principles of affix ordering (derivation closer to the root than inflection; prohibition on multiple exponence), Lusoga presents two interesting puzzles: (i) derivational and inflectional suffixes both double; (ii) when inflectional suffixes double, they do so on either side of derivation, violating the “split

morphology” hypothesis. Thus, in a form like *tù-[bàl-é-gàn-é* ‘let’s count each other’ from (20b), the irrealis FV *-e* occurs both before and after the derivational reciprocal suffix *-gan-*. While doubling of derivational suffixes has been previously discussed in the Bantu literature (Hyman 2003b), the doubling of inflection has not. This is the final focus of this study. Given that the doubling occurs in verbs containing the reciprocal suffix *-agan-*, the question we face is what it is about this suffix that triggers the phenomenon. Why is it only the reciprocal that does this?

Our hypothesis is that the phonological form of the reciprocal has led to a reanalysis of the internal morphological structure of the reciprocalized Lusoga verb stem. The reciprocal suffix *-agan-* is the only Lusoga derivational suffix which is both disyllabic and *a*-initial. Taken together, these phonological facts are consistent with a reanalysis of the verb stem in which the reciprocal suffix is bimorphemic, *-a-gan*. Because of its phonological identity, the *-a-* portion became identified with the default FV *-a*. At the same time this permitted the reanalyzed reciprocal suffix, *-gan-*, to conform to the default CVC-verb root structure.

As a result of this reanalysis, the verb structure in (28a) became reinterpreted as in (28b), where we use # to indicate the internal stem boundary:

- | | | | | |
|------|----|-----------------------------|----|-------------------------------|
| (28) | a. | <i>Expected (inherited)</i> | b. | <i>Unexpected (innovated)</i> |
| | | ROOT-Reciprocal-FV | | ROOT-FV#Reciprocal-FV |
| | | ROOT-agan-a | | ROOT-a#gan-a |

From this step, the following analogical reanalyses follow straightforwardly, with allomorph variation in (29b) conditioned by the phonological size and shape of the root:

- | | | | | | |
|------|----|-----------------------------|----|-------------------------------|--------------|
| (29) | a. | <i>Expected (inherited)</i> | b. | <i>Unexpected (innovated)</i> | |
| | | ROOT-agan-e | | ROOT-e#gan-e | (irrealis) |
| | | ROOT-agan-ir-e | | ROOT-ir-e#gan-ir-e | (perfective) |

In (29a) inflectional *-e* and *-ir-e* are suffixed after derivational *-agan-*. (We show the perfective as *-ir-e* in the above, although its exact allomorph will vary, as pointed out in (22).) In (29b) we see the reanalysis brought on by analogy. As a result, from the simple right-branching suffixing construction in (29a), reciprocal verb stems became reanalyzed, optionally, as compounding, with two roots: the verb root, and *-gan-*. Both are inflectable (29b), though it is possible also to inflect only the verb stem as a whole (29a).

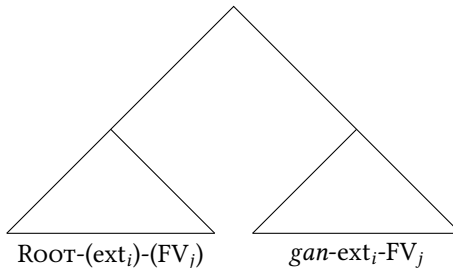
As indicated, the compounding account allows us to account for the apparent affixation of the inflectional suffixes *-e* and *-ir-e* inside of a derivational suffix, the restructured reciprocal *-gan-*. These suffixes also potentially precede the short causative *-i-*. The inflection of stems containing both *-(a)gan-* and the short causative is seen in the following six alternants, based on the causative verb *-lùm-i-* ‘injure’, where *-i-* glides to [y] before the following vowel:⁷

⁷ Although the verb root *-lùm-* means ‘bite’, the semantics of the lexicalized causative verb *-lùm-i-* ‘injure, cause pain’ is most clearly seen in the corresponding lexicalized passive verb *-lùm-ù-* ‘to ache, be in pain’.

- (30) 'let's injure each other'
- a. tù-[lùm-y-ágàn-é
tù-[lùm-ágàn-y-é
tù-[lùm-y-ágàn-y-é
 - b. tù-[lùm-y-é-gàn-é
tù-[lùm-é-gàn-y-é
tù-[lùm-y-é-gàn-y-é

The options in (30a) all follow the expected parsing, with *-agan-* treated as a derivational suffix. Those in (30b) represent the claimed restructuring in which the FV *-e* occurs both before and after reciprocal *-gan-*. In each set, causative *-i-* appears immediately after the root in the first example, after the reciprocal in the second, and both before and after in the third. In the last two examples of (30b), the first (inflectional) *-e* occurs not only before *-gan-*, but also before the (derivational) causative *-i-* suffix. Parallel cases could be illustrated in which *-i-* combines with the various perfective allomorphs. Our analysis, which assumes a double or compound stem structure, each of which is independently inflected, thus nicely accounts for the above (and other) cases where the inflectional FV linearly precedes (restructured) reciprocal *-gan-* and potentially other derivational suffixes.

(31)



Before moving on to our conclusion, we briefly cite phonological evidence for our analysis from closely related Lulamogi, which also optionally realizes the inflectional FV both before and after reciprocal *-gan-* (Hyman In press). In this language, there are two facts concerning vowel length and (pre-)penultimate position that are relevant to the analysis of the reciprocal. First, a word-initial V- prefix lengthens if it is followed by a monosyllabic stem (i.e. if it is in penultimate position). This is seen in (32a):

- (32) a. /a-[ti-â/ → àà-[ty-â 's/he fears'
b. /ba-[ti-â/ → bà-[ty-â 'they fear'
c. /a-[sék-a/ → à-[sék-à 's/he laughs'

As seen in (32b), if the word-initial prefix has the shape CV-, its vowel doesn't lengthen, while in (32c) /a-/ fails to lengthen because it is in pre-penultimate position. The second length-related phenomenon is exemplified in (33):

- (33) a. /tu-[-á-ti-a/ → tw-áá-[ty-à 'we will fear'
 b. /tu-á-[-sek-a/ → tw-á-[-sèk-á 'we will laugh'

In (33a), the prefix sequence /tu-á-/ (1PL-FUT) undergoes gliding + compensatory lengthening to be realized [tw-áá-] in penultimate position. In (33b), on the other hand, the same gliding process applies, but the result is short [tw-á-], since prefixal vowel sequences are realized short in pre-penultimate position.

A systematic exception to both penultimate prefixal V-lengthening and pre-penultimate prefixal V+V shortening occurs when reciprocal *-agan-* is suffixed to a monosyllabic verb root:

- (34) a. àà-[ty-ágán-à 's/he often fears'
 b. tw-áá-[ty-àgàn-á 'we will fear each other'

In (34a), where *-agan-* is used as a frequentative suffix, the initial subject prefix *à-* lengthens even though it is in pre-penultimate position. In (34b), the [tw-áá-] sequence remains long even though it too is in pre-penultimate position. Note also that the first vowel of the *-ty-àgàn-* sequence is short, i.e. compensatory lengthening appears not to apply. All of these observations can be accounted for if we assume the same analysis as in Lusoga:

- (35) a. /a-ti-a#gan-a/ → àà-ty-ágán-à 's/he often fears'
 b. /tu-á-ti-a#gan-a/ → tw-áá-ty-àgàn-á 'we will fear each other'

In (35) the # symbol again represents the boundary between the two stems. The result in (35a) is that the initial /a-/ is now in penultimate position in the first stem and is thus free to lengthen. In (35b) the /tu-á-/ is now also in penultimate position, and so [tw-áá-] fails to shorten. Taken alone, either our Lusoga analysis or this Lulamogi analysis of Hyman (In press) might seem overly speculative—and especially surprising from a traditional Bantu perspective. However, taken together, the two sets of facts support each other. In fact, Lulamogi is the only other Bantu language we are aware of that allows the option of spelling out the FV both before and after the reciprocal extension. Thus compare the following with Lusoga (20a,b):

- (36) 'let's count each other'
 a. tú-[bàl-àgàn-é
 b. tú-[bàl-è-gàn-é

As we stated earlier, we think this reconceptualization is due to the fact that *-agan-* is the only highly productive suffix that could be re-interpreted in the way we have suggested. It is significant that the historical Bantu reciprocal suffix **-an-* often joins with other suffixes to make a -VCVC- conglomerate (cf. Bostoen & Nzang-Bie 2010: 1289–91 for further discussion). In Lusoga, Lulamogi, Luganda, and many other Bantu languages, **-an-* has joined with an archaic **-ang-* or **-ag-* extension which likely had an original

pluractional interpretation.⁸ As we have suggested, the shape and “weightiness” of the resulting *-agan-* has led to multiple exponence and inflectional “entrapment” within the derivational morphology of the verb stem in Lusoga (and Lulamogi). We consider further implications in the next section.

6 Conclusion

In the preceding sections we have documented multiple exponence of derivational suffixes (§3) and inflectional suffixes (§4) in Lusoga, and have proposed a restructuring analysis of **-agan-* > *-a-gan-* in §5 to account for the multiple copies of the inflectional FV in *-e-gan-* sequences. Harris & Faarlund (2006) discuss instances in which grammaticalization of an outer affix “traps” an inner one, with the result that the two affixes occur in an unexpected order. Loss of the trapped affix is an attested diachronic repair for this “entrapment” situation; doubling (by addition of an outer inflectional affix) is another. Lusoga, however, appears to illustrate reanalysis of a different kind, in which an existing affix is reanalyzed as a root, and doubling represents agreement in a compounding-like structure of the sort proposed by Inkelas & Zoll (2005) for reduplication, in which doubled morphemes can also show divergent allomorphy of the kind displayed by the perfective complex in Lusoga. If correct, the Lusoga facts are important both from a synchronic and diachronic point of view. An historical change of **affix* > root would contradict the more broadly attested grammaticalization pattern **root* > affix (but see Norde 2009). Synchronically, multiple exponence of the inflectional ending is quite different from the doubling of derivational suffixes. While the latter has been interpreted as the resolution of a template-scope mismatch, perhaps spelled out cyclically, this cannot work for inflectional doubling. In the examples in (30) above, it was seen that the derivational causative *-i-* can appear once or twice: It can appear either before the reciprocal (*-i-agan-*), after it (*-agan-i-*), or both before or after (*-i-agan-i-*). However, we have thus only shown two possibilities concerning inflectional FVs such as subjunctive *-e*. In (20), repeated as (37a,b), we saw that *-e* can appear either after *-agan-* or both before and after *-agan-*:

- (37) a. mù-[bàl-ágàn-é ‘count each other!’
 tù-[bàl-ágàn-é ‘let’s count each other!’
 tì-ba-a-[bál-àgàn-é ‘they will not count each other’
 b. mù-[bàl-é-gàn-é ‘count (pl.) each other!’
 tù-[bàl-é-gàn-é ‘let’s count each other!’
 tì-bá-á-[bál-è-gàn-á ‘they will not count each other’
 c. *mù-[bàl-é-gàn-á ‘count each other!’
 *tù-[bàl-é-gàn-á ‘let’s count each other!’
 *tì-bá-á-[bál-è-gàn-á ‘they will not count each other’

⁸ While the most general realization of the reciprocal is *-agan-* in Luganda, the form is regularly *-anḡan-* after CV verb roots, e.g. *mw-anḡan-* ‘shave each other’. Since *-anḡan-* derives from **-angan-* via Meinhof’s Law (Katamba & Hyman 1991: 192–193), this provides evidence that the earlier bimorphemic form was likely **-ang-an-* in all three closely related languages.

However, (37c) shows that it is not possible to express the inflection only on the first stem. These facts motivate the compounding structure we have offered for the Lusoga verb stem, and suggest that the second member, on which inflection is obligatory, is the head, and agreement in derivational and inflectional properties is optionally enforced, explaining the presence of duplicate morphology on the first constituent. The structures in (37) are not amenable to a cyclic analysis proceeding bottom-up from the verb root.

In Lusoga, compounding, derivation and inflection are intermingled in typologically unusual ways. The complexities of the system – and of multiple exponence in general (Anderson 2015: 21) – give credence to views in which morphology is a component of grammar with its own internal morphotactic organization; it does not mirror syntax directly and thus cannot be reduced to syntactic principles. This is a result of which we think Steve would approve.

References

- Abasheikh, Mohammad. 1978. *The grammar of Chimwi:ni causatives*. University of Illinois PhD thesis.
- Anderson, Stephen R. 1992. *A-morphous morphology*. Cambridge: Cambridge University Press.
- Anderson, Stephen R. 2015. Dimensions of morphological complexity. In Matthew Baerman, Dunstan Brown & Greville G. Corbett (eds.), *Understanding and measuring morphological complexity*, 11–26. Oxford: Oxford University Press.
- Bastin, Yvonne. 1983. *La finale -IDE et l'imbrication en bantou*. Annales, Série IN-8, Sciences Humaines 114. Tervuren: Musée Royal de l'Afrique Centrale.
- Bastin, Yvonne. 1986. Les suffixes causatifs dans les langues bantoues. *Africana Linguistica* 10. Tervuren: Annales du Musée Royale de l'Afrique Centrale. Série IN-8, Sciences Humaines 121, 55–145.
- Bostoen, Koen & Yolande Nzang-Bie. 2010. On how “middle” plus “associative/reciprocal” became “passive” in the Bantu A70 languages. *Linguistics* 48(6). 1255–1307.
- Downing, Laura J. 2005. Jita causative doubling and paradigm uniformity. In Laura J. Downing, T. Alan Hall & Renate Raffelsiefen (eds.), *Paradigms in phonological theory*, 122–144. Oxford: Oxford University Press.
- Good, Jeff. 2005. Reconstructing morpheme order in Bantu: the case of causativization and applicativization. *Diachronica* 22(1). 55–109.
- Harris, Alice & Jan Terje Faarlund. 2006. Trapped morphology. *Journal of Linguistics* 42. 289–315.
- Hyman, Larry M. 1994. Cyclic phonology and morphology in Cibemba. In Jennifer Cole & Charles Kisseberth (eds.), *Perspectives in phonology*, 81–112. Stanford: C.S.L.I.
- Hyman, Larry M. 2003a. Sound change, misanalysis, and analogy in the Bantu causative. *Journal of African Languages and Linguistics* 24(1). 24–55.
- Hyman, Larry M. 2003b. Suffix ordering in Bantu: A morphocentric approach. In Geert Booij & Jaap van Marle (eds.), *Yearbook of morphology 2002*, 245–281. Amsterdam: Springer.

- Hyman, Larry M. 2016. *The autosegmental approach to tone in Lusoga*. Tech. rep. Ms. University of California, Berkeley.
- Hyman, Larry M. In press. Prefixal vowel length in Lulamogi: a stratal account. *Journal of African Languages and Linguistics*.
- Hyman, Larry M. & Sam Mchombo. 1992. Morphotactic constraints in the Chichewa verb stem. In *Proceedings of the Berkeley Linguistic Society*. Berkeley Linguistic Society.
- Inkelas, Sharon & Cheryl Zoll. 2005. *Reduplication: Doubling in morphology*. Cambridge: Cambridge University Press.
- Katamba, Francis & Larry M. Hyman. 1991. Nasality and morpheme structure constraints in Luganda. In Francis Katamba (ed.), *Lacustrine Bantu phonology* (Afrikanistische Arbeitspapiere 25), 175–211. Cologne: Institut für Afrikanistik, Universität zu Köln.
- Kiparsky, Paul. 1982. Lexical morphology and phonology. In Linguistic Society of Korea (ed.), *Linguistics in the morning calm: Selected papers from SICOL-1981*, 3–91. Seoul: Hanshin.
- Meeussen, Achille E. 1967. Bantu grammatical reconstructions. *Africana Linguistica* 3(1). 79–121.
- Muriungi, Peter Kinyua. 2003. *Phrasal movement inside Bantu verbs*. University of Tromsø PhD thesis.
- Norde, Muriel. 2009. *Degrammaticalization*. Oxford: Oxford University Press.
- Sibanda, Galen. 2004. *Verbal phonology and morphology of Ndebele*. University of California, Berkeley PhD thesis.