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Summary and Keywords

This chapter is an overview of the structure of words belonging to the major lexical categories (nouns and verbs) in Niger-Congo languages, with an emphasis on the morphological patterns typically found in the core Niger-Congo languages commonly considered as relatively conservative in their morphology: rich systems of verb morphology, both inflectional and derivational, and systems of gender-number marking with a relative high number of genders, and no possibility to isolate number marking from gender marking. As regards formal aspects of the structure of words, as a rule, verb forms are morphologically more complex than nominal forms. The highest degree of synthesis is found in the verbal morphology of some Bantu languages. Both prefixes and suffixes are found. Cumulative exponence is typically found in gender-number marking. Multiple exponence is very common in the verbal morphology of Bantu language but rather uncommon in the remainder of Niger-Congo. Consonant alternations are common in several groups of Niger-Congo languages, and various types of tonal alternations play an important role in the morphology of many Niger-Congo languages. The categories most commonly expressed in the inflectional morphology of nouns are gender, number, definiteness, and possession. The inflectional morphology of verbs commonly expresses agreement, TAM, and polarity, and is also widely used to express interclausal dependencies and information structure. As regards word formation, the situation is not uniform across the language groups included in Niger-Congo, but rich systems of verb-to-verb derivation are typically found in the Niger-Congo languages whose morphological patterns are commonly viewed as conservative.

Keywords: Niger-Congo, morphology, inflection, derivation, compounding

1. Introduction

The name Niger-Congo, introduced in 1955 by Joseph H. Greenberg, became later the name usually given to the putative language phylum designated by Greenberg himself as Niger-Kordofanian—see Greenberg (1955, 1963). The Niger-Congo phylum is commonly presented as a language family with the following branches: Mande, Kordofanian, Atlantic, Ijoid, Kru, Kwa, Benue-Congo (including Bantu), Dogon, Gur, Adamawa, and Uban-

gian, with a total of approximately 1,500 languages. The validity of some of these groups of languages as genetic units within Niger-Congo remains controversial. To take just two examples among many others, the Mel languages, initially included in the Atlantic branch, are now considered a distinct branch of Niger-Congo, and the status of Senufo as a sub-branch of Gur or as a separate branch is unclear (Naden, 1989). Moreover, the inclusion of some of the groups of languages listed in the Niger-Congo phylum is controversial. A particularly critical opinion is expressed by Dimmendaal (2008, 2011), who argues that the inclusion of Mande, Ijoid, Dogon, and Ubangian into Niger-Congo is problematic, and that it is safer to consider them as independent language families whose Niger-Congo affiliation cannot be considered as established.

This question has a direct impact on this article, given that the main reason for setting apart Mande, Ijoid, Dogon, and Ubangian is that the language groups that constitute the core of the Niger-Congo phylum show particularly clear evidence supporting the hypothesis of a genetic relationship in two morphological subsystems: the gender-number system, and the system of verb-to-verb derivation (the so-called verb extensions), whereas in Mande, Ijoid, Dogon, and Ubangian, cognates of the gender-number markers and verb extensions found in core Niger-Congo languages have not been identified with certainty.

This article focuses on the morphological characteristics of the major lexical categories (nouns and verbs) in the Niger-Congo languages whose morphology seems to best maintain patterns that already existed in the proto-language, even if their concrete morphological material may have undergone renewal. Such languages are particularly frequent in the Bantu and Atlantic groups. Some indications will, however, be provided about the morphological characteristics of the languages in which the morphological structure that can be reconstructed for the ancestor(s) of the core Niger-Congo languages, if it ever existed, has undergone radical changes.

Section 2 discusses formal aspects of the structure of words in Niger-Congo languages. Section 3 is dedicated to the categories expressed in the inflectional morphology of nouns and verbs. Section 4 is devoted to constructional morphology, or word formation (derivation and compounding).

2. Formal Aspects of the Structure of Words

2.1 Isolation Versus Synthesis

Extreme cases of radically isolating languages (i.e., languages with monomorphemic words only), or of languages with an extremely high morpheme to word ratio (comparable to that found for example in Northwest Caucasian languages), are not attested among Niger-Congo languages. The morpheme to word ratio is, however, not uniform across Niger-Congo languages. It is, for example, considerably lower in some Kwa languages, such as Ewe, than in Bantu languages. As a rule, verb forms are morphologically more complex than noun forms.

2.1.1 Isolation Versus Synthesis in Nominal Morphology

In the Niger-Congo languages that have the particular type of gender-number system traditionally referred to as 'noun class system', noun forms typically consist of a stem and an obligatory affix (either prefix or suffix) expressing (a) the singular versus plural distinction and (b) the distinction between semantically related lexemes sharing the same stem but differing in their agreement properties. For example, in Tswana, the stem **-tɬʰàrì** is shared by sg. **lì-tɬʰàrì** pl. **mà-tɬʰàrì** (gender 5/6) 'leaf' and sg. **sì-tɬʰàrì** pl. **dì-tɬʰàrì** (gender 7/8) 'tree', but **-tɬʰàrì** alone cannot constitute a word.[1] In the languages in question, the same morphological structure with an obligatory gender-number marker is shared by pronouns and adnominals. In some of the language groups included in the Niger-Congo phylum (Bantu, Atlantic), the languages that depart from this situation are exceptional.

By contrast, monomorphemic noun forms are very common in some other language groups (Kwa, Western Benue-Congo). For example, Baule (Kwa) has no nominal inflection *stricto sensu*. Underived nouns such as **wàkǎ** 'tree' or **ǹnyâ** 'leaf' are unsegmentable forms. In such languages, the expression of categories such as number or definiteness typically involves markers that systematically occur at the right edge of noun phrases (sometimes also, but less commonly, at the left edge), not necessarily in contact with the head noun.

It is, however, interesting to observe that, in the nominal morphology of Niger-Congo languages, derivation involving the addition of dedicated derivational affixes and compounding tend to be more developed in the languages that have very reduced systems of noun inflection than in those that have rich systems of noun inflection, in which the conversion of verbs into nouns, and the relationship between semantically related nouns, are often marked by mere gender assignation or gender shift, without the involvement of dedicated derivational affixes.

2.1.2 Isolation Versus Synthesis in Verbal Morphology

Among Niger-Congo languages, the highest degree of synthesis in verb morphology is found in Bantu. Bantu languages typically have the kind of complex verb morphology consisting of a stem and a number of affixes, both inflectional and derivational, whose ordering must be stipulated through the use of position class morphology, or a template.

A Bantu verb form typically consists of a *root* (irreducible lexical element) together with an obligatory suffix (the *final vowel*, or simply *final*) and a variable number of other affixes whose presence depends on a variety of factors, each affix having its position in the string. The root may be immediately followed by derivational suffixes that modify its meaning without altering its valency. The part of the verb form constituted by the root and such derivational suffixes can be referred to as the *extended root*.

For example, in Tswana (Creissels, 2006), taking the extended root as the zero point, the verbal template can be described as a sequence of positions numbered from –4 (the left-most possible position) to +5 (the rightmost possible position):

- Position −4 can be occupied by a negation marker.

- Position −3 remains empty in the imperative. In the infinitive, which shows a mixture of nominal and verbal properties, it is filled by the class 15 prefix. In all the other cases, it is obligatorily filled by a subject index.

- Position −2 can be filled by affixes expressing (or contributing to the expression of) various TAM-polarity values.

- Position −1 can be occupied by object indexes and by the reflexive marker. Up to three successive affixes can be found in this position.

- Position +1 can be filled by one or more affixes encoding valency operations: causative, applicative, anticausative, reciprocal.

- Position +2 can only be occupied by the perfect positive marker.

- Position +3 can only be filled by the passive marker.

- Position +4 is the only one that can be left empty in no circumstances. The 'final (vowel)' filling this position contributes to the identification of the individual tenses but does not carry any syntactic or semantic information of its own, because with the exception of **e ~ ɩ** (found in the perfect positive only), each final is shared by a set of forms impossible to define straightforwardly as sharing a particular set of syntactic or semantic features.

- Position +5 ('postfinal') can be filled by the imperative plural marker, the relative marker, or the clitic form of the interrogative pronoun 'what'.

Hyman (2003) is an important reference on the templatic morphology of Bantu verbs.

The opposite situation, with a very low degree of synthesis in verb morphology, can be found in Mande (a language family whose inclusion in the Niger-Congo phylum is, however, controversial). For example, Mandinka (Mande) has just one inflectional affix of verbs: **–ta** (incompletive intransitive), and the only other affixes that can be found within Mandinka verb forms are two suffixes characteristic of non-finite verb forms, and a causative suffix.[2]

In most Niger-Congo languages, the degree of synthesis in verb morphology lies somewhere between these extremes. Interestingly, in northwestern Bantu languages (geographically close to languages with a much lower degree of synthesis in verbal morphology), it is possible to observe the development of maximality constraints resulting in the loss of derivational affixes of verbs (Hyman, 2004, 2008; Van de Velde, 2009).

Interestingly, contrary to the tendency observed in nominal morphology (i.e., the presence of rich systems of nominal derivation in languages with very reduced systems of

nominal inflection), among Niger-Congo languages, verbal derivation tends to be more developed in the languages that also have relatively rich systems of verbal inflection.

2.2 Allomorphy, Zero Marking, Sandhi

As a rule, Niger-Congo languages have no salient feature with respect to phenomena traditionally considered characteristic of 'fusional' as opposed to 'agglutinative' morphology, such as the use of suppletive allomorphs, the avoidance of zero marking, and the tendency to blur the boundaries between adjacent formatives. Such phenomena can be found among Niger-Congo languages, but in comparison to other language families, they are not particularly systematic.

2.3 Types of Affixes

Both prefixes and suffixes are common in Niger-Congo languages, with a more or less marked predominance of either prefixes or suffixes in some language groups. For example, gender-number markers are predominantly prefixed in some language groups (Benue-Congo, Atlantic), suffixed in others (Gur, Kru).

Circumfixes (in particular, circumfixed gender-number markers) are sometimes mentioned in descriptions of Niger-Congo languages, but in most cases, as discussed by Creissels (2019) for Seereer (Atlantic), a closer look at the data leads to the conclusion that they are best analyzed as the combination of two distinct morphemes.

In traditional descriptions of Bantu languages, the term 'infix' designates non-initial prefixes, but real infixes (i.e., affixes inserted within roots) are very rare in Niger-Congo languages. See, however, Kiessling (2006) on the infixes of Isu, and Ellington (1977) and Hyman (2010) on the infixes of Tiene.

2.4 Cumulative Versus Separative Exponence

In the languages of the world, the universal default is to express each morphological category by a dedicated formative. In Niger-Congo languages too, monoexponential (or separative) formatives are more common than polyexponential (or cumulative) formatives, that is, formatives that simultaneously code more than one category. Some types of cumulative formative are, however, very common, in particular unsegmentable gender-number markers in noun morphology, and unsegmentable TAM-polarity markers in verb morphology. Other types of cumulative formatives occur sporadically. For example, in Basari (Atlantic), unsegmentable markers simultaneously code subject and object indexation. Fulfulde (Atlantic) is an extreme case, with unsegmentable verb endings conflating information on voice (active / passive / middle), TAM, polarity, and the information structure of the clause.

2.5 Multiple Exponence

Multiple (or extended) exponence (the occurrence of multiple realizations of a single morphological feature or bundle of features in a single word) is typically found in the languages that have the kind of templatic morphology evoked in section 2.1.2 for Tswana. For example, in Tswana verb morphology, as illustrated in (1), the expression of the *present* versus *perfect* and *positive* versus *negative* distinctions in conjoint verb forms involves five of the nine positions available for verb affixes. In other words, none of the formatives occupying one of the five positions in question can be straightforwardly identified as the exponent of 'perfect', or of 'negation'.

(1) Tswana (Bantu): multiple exponence in the expression of TAM and polarity

−4	−3	−2	−1	0	+1	+2	+3	+4	+5
			ó-		rɛ́k			-á/à		'(s)he buys / is buying'
χà-	á-				rék			-ı́		'(s)he does not buy / is not buying'
			ó-		rék		-íl	-é/è		'(s)he has bought'
χà-	á-	à-			rɛ́k			-á		'(s)he has not bought'

2.6 Reduplication

Total or partial reduplication is widespread as a morphological process among Niger-Congo languages, often with its usual iconic functions of expressing notions such as plurality, iterativity, distributivity, approximation, or emphasis, but also sometimes with less expected functions.

In Seereer (Atlantic), partial reduplication is used to derive the designation of persons living in a given place (as in **o-*paa*-fatik** 'resident of Fatik'), names of places occupied by a given family or by a given kind of plants (as in **a-*nju*-juuf** 'place where members of the Juuf family live', or **ɓasi** 'sorghum' > **o-*ɓaa*-ɓasi** 'sorghum field'), and agent nouns (as in **jal** 'work' > **o-*caa*-jal** 'worker') (Faye, 1979).[3] The use of reduplication in the formation of agent nouns is also found among others in Yoruba (Benue-Congo).

In Ewe (Kwa), verbs may be nominalized by reduplication, as in **dzo-dzó** 'leaving', adverbs may be formed from other word classes by reduplication, many adjectivals are derived by the reduplication of an intransitive verbal stem, and in verbal inflection, intransitive verbs are reduplicated to express the progressive aspect (Ameka, 1991). In Ganja (Atlantic), the expression of verb focus involves reduplication of the stem (Creissels & Biaye, 2016).

Less common uses of reduplication include the formation of causative verbs by reduplication in Ganja (Atlantic), as in **baay** 'play' **> *bab*-baay** 'make play' (Creissels & Biaye, 2016), and the expression of third person singular possession by means of partial noun reduplication in Tarok (Robinson, 1976).

2.7 Non-Concatenative Morphology

2.7.1 Segmental Alternations

Stem-internal vowel alternations (such as English **write** vs. **wrote**) can be found in languages belonging to various branches of Niger-Congo, but on the whole do not constitute a prominent feature of Niger-Congo morphology. By contrast, consonant alternations, either in fully morphologicized form, or with a still more or less apparent phonological conditioning, are common in several groups of Niger-Congo languages (and also in Mande languages, whose Niger-Congo affiliation is however controversial, cf. Soninke **mùkkú**, gerundive of the verb **mùgú** 'hear'). In particular, an important characteristic of several languages belonging to various subgroups of the northern branch of the Atlantic family (Fula, Seereer, etc.) is that gender-number marking on nouns and gender-number agreement marking crucially involve not only affixes, but also stem-initial alternations, as illustrated in (2).

(2) Seereer (Atlantic; Creissels, 2015)

go–	**f**aam	'donkey'
a–	**p**aam	'donkeys'
ga–	**mb**aam	'big donkey'

As illustrated by this example, as a rule, stem-initial alternations contributing to the expression of class distinctions in Atlantic languages typically involve a division of stem-initial consonants into three series, do not affect the place of articulation of the stem-initial consonant, and operate on features such as ±stop, ±fortis, or ±prenasalized.

2.7.2 Prosodic Alternations

The overwhelming majority of Niger-Congo languages have tone,[4] and the importance of tonal alternations that cannot be straightforwardly analyzed as the result of interaction between tones underlyingly belonging to adjacent formatives is a hallmark of Niger-Congo morphology.[4] Tonal morphology is not equally important in all languages, but all the functions commonly fulfilled by affixation can also be fulfilled by tonal alternations.

Kulango (Gur) illustrates the extreme case of a tone language in which tone cannot be used to express lexical distinctions, because all lexemes belonging to a given category have the same tone pattern, but plays an important morphological role. For example, all Kulango verbs have the tone pattern HL in the completive aspect in clause-internal position, LL in the incompletive aspect, LH in the imperative, and HH in the completive aspect in clause-final position (Kra, 2016).

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In the description of morphological operations manifested in tonal alternations that have no straightforward explanation in terms of tonal interaction between adjacent formatives, a distinction must be made between these three possibilities:

> **(a)** complexification of the lexical tone pattern, which can be accounted for by positing an *additive morphotoneme*;
>
> **(b)** simplification of the lexical tone pattern;
>
> **(c)** replacement of the lexical tone pattern by a fixed contour, attributable to the action of a *replacive morphotoneme*.

As an example of (a), in the verbal morphology of many Bantu languages, the expression of some TAM-polarity values involves a modification of the tonal contour of the stem analyzable as resulting from the addition of a grammatical H tone (called 'melodic H' in many recent descriptions). As an example of (c), in many Bantu languages, the verb stem has a fixed LH contour in the subjunctive, irrespective of its lexical contour—compare Odden and Bickmore (2014) and the other articles included in *Africana Linguistica* 20. Accounting for the tonal morphology of the verb in a Bantu language may require a full monograph study such as Creissels, Chebanne, and Nkhwa (1997) on Tswana, a language with a particularly intricate system of tonal alternations in verbal inflection.

In Bantu languages, even the manifestation of tones whose analysis as underlyingly belonging to a particular formative is uncontroversial may involve long-distance spreading or shifting mechanisms that have no equivalent in segmental morphology, and greatly complexify the analysis of tonal systems.

For example, in Swati (Bantu), the verb form **basebentelána** 'they work / are working for each other (cj.)', with a single H tone on the penult, is the realization of this underlying string of formatives:

bá-	sébent	-el	-an	-a
subject index	'work'	applicative	reciprocal	final[5]

Two of the formatives that constitute this word are inherently H-toned, but the surface form includes a single H tone associated to a vowel belonging to another formative. In this particular case, no special morphological operation is at play, because the relationship between the two underlying H's and the single surface H can be described as the result of general tone spreading / shifting processes that operate in Swati irrespective of the morphological structure of words.

Such phenomena, which incidentally played a major role in the emergence of autosegmental morphology, are typically found in eastern and southern Bantu languages. Elsewhere in Niger-Congo, interactions between tones underlyingly belonging to different formatives tend to be only 'local'.

As a rule, in Niger-Congo languages, tonal alternations are particularly important in verbal morphology. In quite a few languages belonging to various branches of Niger-Congo, nominal lexemes may be distinguished by tone only, but verbs do not have lexical tone,

and the tone pattern of verb forms is entirely determined by their grammatical value. This situation is found, among others, in Balant (Atlantic), Baule (Kwa), Urhobo (Benue-Congo), and Gbaya (Ubangian).

3. Inflectional Morphology

3.1 Noun Inflection

3.1.1 Gender-Number Marking in So-Called Noun Class Systems

In the Niger-Congo languages whose nominal system is traditionally described in terms of 'noun classes', gender and number are expressed by means of etymologically opaque portmanteau morphs, for which there is no evidence that they were ever segmentable into a gender marker and a number marker. In Niger-Congo linguistics, 'noun class' refers to the division of noun forms into subsets according to their behavior in agreement mechanisms that operate in the combination of nouns with various types of modifiers, in the use of pronouns, and in the indexation of arguments on the verb. Noun forms typically include an affix (either a prefix or a suffix) expressing number and also related to their agreement behavior, but the correspondence between the gender-number markers attached to nouns and the agreement class to which they belong is not always one-to-one.

For example, in Jóola Fóoñi (Atlantic), **ka-laak** 'field' (pl. **ʊ-laak**) and **kʊ-nak** 'days' (sg. **fʊ-nak**) have different prefixes (and opposite number values), but behave exactly in the same way as agreement controllers, whereas **kʊ-sɛɛk** 'women' (sg. **a-sɛɛk**) and **kʊ-nak** 'days' (sg. **fʊ-nak**) have the same prefix (and the same number value) but do not belong to the same agreement class.

In a given language, the number of distinct agreement classes for nouns is typically between 10 and 15, but systems distinguishing 30 classes or so can be found among Atlantic languages.

The correspondence between the agreement properties of a given singular form, and those of the corresponding plural form, may be complex. This is precisely the reason why many descriptions of Niger-Congo gender-number systems do not emphasize the possibility of dividing noun *lexemes* into *genders*, but rather start from a division of noun *forms* into *classes* in which the singular form and the plural form of a given noun are treated as two distinct units; in this approach, a gender may be subsequently defined as a pair of classes that include the singular and plural forms of the same lexemes.

For example, in Jóola Banjal (Atlantic), as illustrated in (3), the singular form **fʊ-mangɔ** 'mango' belongs to a class that can be labeled class F, whose characteristics include a prefix **fʊ- ~ fu- ~ f-** for nouns (depending on the presence/absence of a consonantal onset, and on vowel harmony), and the same prefix **fʊ- ~ fu- ~ f-** for attributive adjectives.

 (3)

Jóola Banjal (Atlantic)

(3a)

fʊ-mangɔ   f-ɛmɐk
CLf-mango   CLf-big
'big mango'

The plural form **gʊ-mangɔ** 'mangoes' belongs to another class, labeled class G, whose characteristics include a nominal prefix **gʊ- ~ gu- ~ g-** (or for some nouns the lexically conditioned variant **ga-**), and the same prefix **gʊ- ~ gu- ~ g-** for attributive adjectives.

(3b)

gʊ-mangɔ   g-ɛmɐk
CLg-mango   CLg-big
'big mangoes'

Similarly, **e-be** 'cow' as a noun form belongs to class E, whose characteristics include a prefix **e- ~ ɛ- ~ y-** for nouns and the same prefix for attributive adjectives, and **si-be** 'cows' belong to class S, whose characteristics include a prefix **sɪ ~ si- ~ s-** for nouns and the same prefix for attributive adjectives.

(3c)

e-be   y-ɛmɐk
CLe-cow CLe-big
'big cow'

(3d)

si-be   s-ɛmɐk
CLs-cow CLs-big
'big cows'

Note that, as regards lexemes, **fʊ-mangɔ** is also the quotation form of a lexeme that has two inflected forms (**fʊ/gʊ-mangɔ**) and belongs to gender F–G, whereas **e-be** 'cow' is also the quotation form of a lexeme that has two inflected forms (**e/si-be**) and belongs to gender E–S.

In the description of Niger-Congo noun class systems, the regularity of agreement generally makes it easy to establish the number of agreement classes into which noun forms divide (i.e., the number of possible agreement patterns); by contrast, the idiosyncrasies shown by many nouns in the singular-plural correspondence and the variation observed in plural formation often make it very difficult to decide how many genders must be rec-

ognized, if genders are defined as sets of nominal lexemes with the same agreement properties both in the singular and in the plural.

In (4), the division of Tswana noun forms into 12 classes is illustrated by the agreement between nouns and adjectives in the 'noun + attributive adjective' construction.[6]

(4) Tswana (Bantu)

a.	cl. 1	mʊ̀-sádì	jó	mʊ̀-ʃá	'new woman'
b.	cl. 2	bà-sádì	bá	bà-ʃá	'new women'
c.	cl. 3	mʊ̀-lìmɔ̀	ó	mʊ̀-ʃá	'new medicine'
d.	cl. 4	mì-lìmɔ̀	é	mì-ʃá	'new medicines'
e.	cl. 5	lì-sàká	lé	lì-ʃá	'new cattle kraal'
f.	cl. 6	mà-ràká	á	mà-ʃá	'new cattle kraals'
		mà-lwàpá	á	mà-ʃá	'new courtyards'
		mà-dʒàŋ	á	mà-ʃá	'new grasses'
g.	cl. 7	sì-kólò	sé	sì-ʃá	'new school'
h.	cl. 8-10	dì-kólò	tsé	díɲ̀-tʃʰá	'new schools'
		dì-qʰósì	tsé	díɲ̀-tʃʰá	'new chiefs'
		dì-kwálɔ̀	tsé	díɲ̀-tʃʰá	'new books'
i.	cl. 9	qʰósì	é	ɲ̀-tʃʰá	'new chief'
j.	cl. 11	lʊ̀-lwàpá	ló	lʊ̀-ʃá	'new courtyard'
		lʊ̀-kwálɔ̀	ló	lʊ̀-ʃá	'new book'
k.	cl. 14	bʊ̀-dʒàŋ	dʒó	bʊ̀-ʃá	'new grass'
l.	cl. 15-17	χʊ̀-lìmà	mó	χʊ̀-ʃá	'new way of cultivating'

(4) also illustrates the regular singular-plural pairings (or major genders) of Tswana: 1/2 (**mʊ̀-sádí / bà-sádí**), 3/4 (**mʊ̀-lìmɔ̀ / mì-lìmɔ̀**), 5/6 (**lì-sàká / mà-ràká**), 7/8–10 (**sì-kóló / dì-kóló**), 9/8–10 (**qʰósí / dì-qʰósí**), 11/6 (**lʊ̀-lwàpá / mà-lwàpá**), 11/8–10 (**lʊ̀-kwálɔ́ / dì-kwálɔ́**), and 14/6 (**bʊ̀-dʒàŋ / mà-dʒàŋ**).

3.1.2 The Emergence of Plural Markers Dissociated From Gender Markers

The phenomenon described in this section, which constitutes a major deviation from the Niger-Congo prototype of noun class systems, can be observed among others in Ñun languages (Atlantic). In Ñun languages, some nouns follow the typical Niger-Congo pattern according to which the *singular* versus *plural* distinction is expressed by a change in gender-number prefix of the noun and in its agreement properties, but others express the plural by the addition of a dedicated plural marker. As a rule, with nouns taking the dedicated plural marker, modifiers show the same agreement marks in the singular and in the plural, but in the plural, they take an additional affix expressing plural agreement as in (5).

(5)

Guñaamolo (Ñun, Atlantic; Creissels, 2015)

(5a)

ka-taama   kʁ-denn
CLka-river   CLka-big
'big river'

(5b)

ka-taama-aŋ   kʁ-denn-eŋ
CLka-river-PL   CLka-big-PL
'big rivers'

As regards the historical origin of the development of dedicated plural markers dissociated from the noun class system, there is evidence that they result from the reanalysis of an associative plural marker (i.e., a marker that typically combines with individual names of persons to express '*x* and associates') as an ordinary additive plural marker, and its gradual extension to nouns other than those likely to combine with an associative plural marker.

3.1.3 Plural Marking in Genderless Languages

As a rule, the Niger-Congo languages that do not have a synchronically active gender-number system of the type presented in 3.1.1 have a single plural marker placed at one of the edges of the noun phrase rather than attached to the head noun, such as Fon **dìdè Kɔ̀kú tɔ̀n ɔ́ lɛ́** (sketch Koku GEN DEF PL) 'Koku's sketches'.

3.1.4 Definiteness Marking

Bound morphemes expressing definiteness (either affixes or clitics) are relatively common in Niger-Congo languages. Diachronically, demonstratives are the main source of definiteness markers, which explains why, in languages in which demonstratives express gender-number agreement with their head, definiteness marking normally implies additional gender-number marking, as in (6).

(6)

Jóola Fóoñi (Atlantic)

(6a)

kʊ-ñul	**f-al**	**bʊ-rʊŋ**	**sɪ-yɛn**
CLbk-child	CLf-river	CLb-road	CLs-dog
'children'	'river'	'road'	'dogs'

(6b)

kʊ-ñul-a-k	f-al-a-f	bʊ-rʊŋ-a-b	sɪ-yɛn-a-s
CLbk-child-D-CLbk	CLf-river-D-CLf	CLb-road-D-CLb	CLs-dog-D-CLs
'the children'	'the river'	'the road'	'the dogs'

As discussed by Greenberg (1978), such definiteness markers play an important role in the renewal of gender-number morphology, because they very often tend to lose their function of definiteness markers and to become obligatory elements of noun forms. When this evolution is achieved, the only function of the former definiteness markers is to contribute to gender-number marking, which in many cases compensates for the tendency of 'older' gender-number markers to become more and more eroded.

3.1.5 Case

Case defined as a morphological category of nouns involved in the contrast between core arguments (which does not necessarily imply that one of the cases is straightforwardly assigned to subjects, and another one to objects) is very rare in Niger-Congo. Apart from some Kordofanian languages (geographically separated from the remainder of Niger-Congo, and spoken in an area where case inflection of nouns is widespread) and Dogon languages (whose Niger-Congo affiliation is controversial), the only Niger-Congo languages that have morphological case are a group of Bantu languages found in a compact geographical area from Gabon to Angola. In the Bantu languages in question, a tonal distinction originally expressing a definiteness contrast has been reanalyzed as expressing a case contrast—see Blanchon (1999), and Schadeberg (1986).

Morphological marking of nouns in genitive or locative function is less rare, although not very common either. Note that in many cases, genitive markers are not easy to characterize as true affixes or more loosely attached clitics.

In the Bantu languages in which the system of locative marking inherited from proto-Bantu has not been restructured, locative marking (i.e., the morphological characteristics of phrases specifying the location of an event, or the direction or source of movement with movement verbs) is fully integrated into the noun class system, which constitutes a rare typological feature. The languages in question typically have three locative classes. A very limited number of nominal stems can combine directly with locative class prefixes (often just one, which in combination with locative class prefixes yields the hypernymic term 'place'), but the locative class prefixes can also be freely added to noun forms including the prefix of another class, as in Lega **mwǐnò** (class 3) 'village' (**mù-ínò**) > **mùmwǐnǒ** (**mù-mù-ínò**) 'in the village', where the first **mù** is the prefix of the locative class 18, and the second one the prefix of class 3. Forms with a stacked prefix of locative class govern locative class agreement rather than agreement of the class to which the noun belongs inherently, although there is some variation in this respect, as illustrated by Lega **mùmwǐnò gúmòzʲ̧ mwǎbò** 'in one of their villages', where 'one' agrees in class 3, and 'their' in class 18.

3.1.6 Possessive Marking

In some Niger-Congo languages, adnominal possessors can be pronominalized by means of possessive affixes attached to the possessed noun, encoding the person of the possessor. Possessive marking is often restricted to a subclass of nouns, typically kinship terms.

3.1.7 Construct Marking

The term 'construct marking' refers here to forms of nouns that are obligatory in the presence of a given type of modifier, but (in contrast to possessive markers) do not cross-reference the modifier in question. Such forms are found in languages belonging to various branches of Niger-Congo (including language groups whose Niger-Congo affiliation is controversial: Mande and Dogon); see Creissels (2009).

For example, in Yoruba (Western Benue-Congo), nouns have a special form used when they are followed by a genitival modifier beginning with a consonant, or by an enclitic possessive pronoun. This form is marked by the suffixation of a copy of the last vowel. The vowel copy acting as a construct form marker invariably has a mid-tone if it is followed by a noun in the role of genitival modifier (as in **fìlà-ā Túndé** 'Tunde's cap', **ọ̀mọ̀-ọ̀ Táíwò** 'Taiwo's child', **ìlé-ē Bísí** 'Bisi's house'), whereas with enclitic possessive pronouns, its tone is low in the 1SG and 2SG (as in **ọ̀mọ̀-ọ̀ mī** 'my child'), mid in the other persons (as in **ìléē wá** 'our house'); see Rowlands (1969, pp. 45–46).

3.1.8 Predicative Marking of Nouns

Some Bantu languages have a special 'predicative' form of nouns, marked by a tonal alternation, fulfilling the function of equative predicate without the addition of a copula. For example, in Cuwabo, the predicative form of **nígágádda** 'dry cassava' is **nigagádda** 'it is dry cassava' (Guérois, 2015). On the predicative marking of nouns, see also Schadeberg (1986).

3.1.9 Distributivity / Indefinite Free Choice

Many West African languages belonging to various branches of Niger-Congo have noun forms expressing distributivity and indefinite free choice formed by reduplication, often with the insertion of a segmental morpheme. In Yoruba, distributivity is expressed by partial reduplication of the nominal lexeme (as in **ìrì-ìrọ̀lé** 'every evening'), and indefinite free choice by full reduplication and insertion of **-kí-** (as in **fìlà-kí-fìlà** 'any type of cap') – cf. Pulleyblank (2009).

3.2 Verb Inflection

3.2.1 Agreement/Indexation

In many Niger-Congo languages, finite verb forms include an obligatory subject index, analyzable therefore as an agreement marker. Obligatory subject indexation is the rule in some of the language groups included in the Niger-Congo phylum; it is less common in some others.

As regards object indexation, I am aware of no Niger-Congo language in which object indexation would be obligatory with all kinds of objects. Object indexation is common, but it is always restricted either to topical objects, or to some semantic types of objects (definite or human).

In most of the languages that have object indexation, verb forms include a single morphological slot for object indexes, but in some Bantu languages, a verb form can include two or three object indexes (Tswana), sometimes even more (up to six in Kinyarwanda; cf. Kimenyi, 2002, p. 20).

3.2.2 TAM

Among Niger-Congo languages, Bantu languages are famous for the complexity of their TAM-marking systems. In addition to cross-linguistically common TAM categories, they illustrate more 'exotic' types of TAM distinctions, in particular the degree of remoteness from the reference point, both in the past (typically hodiernal / hesternal / remote), and in the future. Nurse (2008) is the main reference on Bantu TAM systems.

A general characteristic of Niger-Congo languages is that, in addition to the TAM values expressed through verb inflection, they have large inventories of more or less grammaticalized auxiliary verbs expressing meanings commonly taken up by adverbial expressions in European languages, that is, auxiliary verbs with meanings such as 'to do first', 'to do again', 'to do often', 'to have previously done', 'to have done the day before', 'not to have done yet', and so forth. Diachronically, such auxiliaries constitute a major source of enrichment or renewal of verb inflection.

3.2.3 Polarity

In Niger-Congo languages, polarity (positive vs. negative) is commonly expressed through verbal inflection rather than by means of more or less autonomous particles, and unsegmentable formatives conflating TAM and negation are not rare. In some languages, negation interferes with the other categories coded by verb inflection in a particularly intricate way, as illustrated by (1).

Moreover, the semantic distinctions expressed by negative verb forms do not always parallel those expressed by positive verb forms. Some semantic distinctions (for example, in Swahili, the distinction between perfect and narrative past) may be neutralized in the negative paradigm, but negative verb forms may also express meanings (for example, again in Swahili, 'not yet') that have no exact counterpart in the positive paradigm.

3.2.4 Verbal Inflection and the Expression of Interclausal Dependencies

In Niger-Congo languages, it is very common that verbal inflection contributes to the expression of inter-clausal dependencies, with forms occurring specifically in clause-chaining (i.e., in constructions functionally equivalent to clause coordination in European languages), in relative clauses, or in particular types of adverbial subordination.

Two types of dependent verb forms can be distinguished. Some of them ('balanced' in Stassen's terminology (1985, pp. 76–83), although morphologically distinct from independent verb forms, are found in subordinate clauses having the same internal structure as independent clauses, and express the same categories as independent verb forms. Others ('deranked' in Stassen's terminology, 'non-finite' in a more traditional terminology) project a phrase whose structure is not entirely similar to that of an independent clause (for example, by lacking a subject), and may also differ from independent verb forms in the categories they express. Among Niger-Congo languages, subordination involving verb forms distinct from those found in independent clauses but showing no evidence of deranking is quite common. Functionally, the forms in question may be comparable to European subjunctives, or have other functions (e.g., many languages have special relative verb forms). Among deranked verb form, infinitives are particularly common. In the languages that have a gender-number system of the type commonly found in the Niger-Congo phylum, infinitives typically show the prefix or suffix of some noun class, like deverbal nouns, and manifest the corresponding agreement properties, if they occupy syntactic positions in which they can act as agreement controllers. They, however, differ from deverbal nouns both in the structure of the phrase they project, but also typically in their morphological structure, which may for example include TAM and polarity markers. Other types of deranked verb forms (participles, converbs) are less common, but for example Jóola Fóoñi (Atlantic) has a participle used for subject relativization, and a converb used in temporal subordination.

3.2.5 Verbal Inflection and the Expression of Information Structure

Among the semantic distinctions less commonly expressed through verbal inflection, a remarkable feature of sub-Saharan languages in general (including Niger-Congo languages) is the relatively high proportion of systems of verbal inflection that directly express distinctions relating to various types of focus phenomena, or interfere with other focus-marking devices. Such systems of verbal inflection are very rare in other parts of the world.

Example (7) illustrates the distinction found in Makhuwa (Bantu) between 'disjoint' verb forms, which imply no particular relationship with the following phrase (and can be found in clause-final position), and 'conjoint' verb forms, obligatorily followed by a phrase interpreted as focalized. In this particular case, focus marking in the verb form is redundant with the use of a special 'predicative' form of the noun (**nramá** vs. **nrámá**), but this is not always the case. For more details about the conjoint versus disjoint distinction in Bantu, see van der Wal and Hyman (2017).

(7)

Makhuwa (Bantu; van der Wal, 2011, p.1735)

(7a)

Nthíyáná	**o-c-aalé**	**nramá.**
CL1.woman	SI.CL1-eat-PRF.CJ	CL3.rice

'The woman ate RICE.'

(7b)

Nthíyáná	**o-hoó-cá**	**(nrámá).**
CL1.woman	SI.CL1-PRF.DJ-eat	CL3.rice

'The woman ate (rice).'

In Jóola languages (Atlantic), an inflected form of the verb formed by reduplication expresses the combination of values 'completive aspect, verb focus'. This form, incompatible with the focalization of other terms of the clause, contrasts with another form expressing the same aspectual value 'completive', but compatible with the focalization of NPs or adverbs. In Jóola languages, it is also possible to use the verb forms typically found in relative clauses to unambiguously mark NP focalization in independent clauses (Hopkins, 1995).

4. Constructional Morphology (Word Formation)

4.1 Verb-to-Verb Derivation

The Niger-Congo languages whose morphological patterns are commonly viewed as relatively conservative typically have rich inventories of suffixes known as 'verb extensions', used to derive verbs from verbs with a variety of functions: verb extensions may increase the valency, decrease the valency, (re-)orient the action, or introduce aspectual specifications.

In addition to the use of verb extensions, reduplication is widely attested in the formation of deverbative verbs, most often with an iterative or pluractional meaning, but sometimes also with more unexpected functions. For example, as mentioned in section 2.5, reduplication is used in Ganja to derive causative verbs.

As discussed in more detail in Hyman (2007), the following verb extensions have been reconstructed for Proto-Bantu and have also been proposed for a reconstruction at Proto-Niger-Congo level by Voeltz (1977): applicative, causative, contactive/tentive, passive, reciprocal, reversive/separative (transitive), reversive/separative (intransitive), stative/neuter, stative/positional.[7]

The applicative extension typically increases the valency by licensing an additional term in the syntactic role of object referring to a participant that otherwise could only be encoded as an adjunct, or could not be mentioned at all. The objects licensed by applicative derivation (commonly termed *applied objects*) may have a variety of semantic roles, but the use of applicative derivation to encode beneficiaries (as in Tswana **rɛ́ká** 'buy' > **rɛ́k-**

ɛ́l-á 'buy for s.o.') is particularly common. For recent and detailed analyses of the functions of Bantu applicatives (including non-canonical ones), see Jerro (2016) and Pacchiarotti (2017).

The causative extension increases the valency by introducing a causer in subject role, whereas the subject of the non-derived verb is demoted to object, as in Tswana **ópɛ́lá** 'sing' > **ópéd-ís-à** 'cause to sing, conduct (a choir)'.

The contactive (or tentive) extension is a nonproductive extension found in verbs that have in common the meaning of actively marking firm contact (Schadeberg, 2003), as Tswana **àp-àr-à** 'put on garments' (cf. **àp-ʊ̀l-à** 'take off garments').

The passive extension decreases the valency by demoting the subject and promoting the object in subject role, as in Tswana **rʊ́má** 'send' > **rʊ́ŋ-w-á** 'be sent'.

The reciprocal extension, in addition to the reciprocal meaning it expresses with semantically bivalent verbs (as in Tswana **rátá** 'love' > **rát-án-á** 'love one another'), is often found with an associative meaning ('do s.t. together', as in Tswana **bʊ́pɛ́χá** 'take shape' > **bʊ́páχ-án-à** 'fuse') in combination with monovalent verbs. It may also express repetitive actions, which is reminiscent of the range of meanings characteristic of so-called pluractional markers. Among Bantu languages, antipassive uses of this extension are common, as in Rundi **tuka** (transitive) 'insult' > **tuk-an-a** (intransitive) 'insult one another' (reciprocal) or 'insult people' (antipassive).

The reversive (or separative) extensions imply movement out of some original position, as in Swahili **zib-a** 'block' > **zib-u-a** 'unblock'. Bantu languages typically have two distinct separative extensions for spontaneous movement (intransitive) and caused movement (transitive), as in Tswana **ám-á** 'touch' / **ám-ʊ́lʊ́χ-à** 'become separated' / **ám-ʊ́lʊ́l-à** 'separate'.

The 'stative' or 'neuter' extension converts transitive verbs into intransitive verbs expressing an anticausative meaning, as in Tswana **síɲá** 'spoil' > **síɲ-ɛ́χ-á** 'become spoilt' or **bɔ́ná** 'see' / **bɔ́n-ál-á** 'be visible, appear'.

The stative / positional extension is found in verbs expressing 'be in a position', as in Tswana **bʊ́tʰ-á** 'repose' / **bʊ́tʰ-ám-á** 'repose comfortably, lie at ease'.

The 'impositive' extension, which is not mentioned in this list but is reconstructed for Proto-Bantu, is functionally a variety of causative involving direct causation as well as a locative element of meaning ('put something into some position'); it constitutes the transitive counterpart of the 'stative/positional' extension, as in Tswana **sík-ám-á** 'lean against (intr.)' / **sík-ɛ́χ-á** 'lean against (tr.)'.

In some cases, the stems to which extensions attach are not attested, and the justification for segmenting the extension is the possibility of substituting other extensions, or the fact that the same ending is found in a series of verb stems sharing a common element of meaning. For example, Tswana has no verb *****àpà**, but comparing **àpàrà**[8] 'put on gar-

ments' with **àpòlà** 'take off garments' makes it possible to identify in these two verbs an abstract stem **àp**- combined with the contactive extension -**ar**- and the separative extension -**ʊl**.[8] For the detailed analysis of a particularly rich system of verbal extensions encoding valency changes in an Atlantic language (with in particular two distinct applicative extensions depending on the semantic role assigned to the applied object, and several causative extensions encoding different types of causation), compare Nouguier-Voisin (2002).

Among the verb extensions that do not modify valency, reversive (or separative) is particularly common. For example, in Jóola Banjal (Atlantic), **eppeg-ul** 'open' derives from **ɛp-pɛk** 'shut' in the same way as **efog-ul** 'dig up' from **ɛfɔk** 'bury' (Bassène, 2007, p. 69). Itive / ventive extensions expressing centripetal / centrifugal movement, sometimes also associated motion (as in Wolof **sàcc** 'steal' / **sàcc-i** 'go and steal' / **sàcc-si** 'come and steal'), although not mentioned in this list, are also relatively common.

Although there is no logical relationship between these two phenomena, the Niger-Congo languages in which the noun class system has been drastically reduced (or even completely lost) also have reduced systems of verb-to-verb derivation. Causative derivation is the type of verb-to-verb derivation most commonly found in the languages that have very reduced inventories of verb extensions.

4.2 Noun-to-Verb Derivation

A very general characteristic of Niger-Congo languages, in particular (but not only) those having morphological patterns close to the Niger-Congo prototype, is the marginality of noun-to-verb derivation. For example, Tswana (Bantu) has denominal verbs such as **χálí-f**(-**á**) 'become angry or fierce' < (**bò**-)**χálí** 'fierceness', but the productivity of the Tswana affixes involved in noun-to-verb derivation is very low.[9]

4.3 Noun-to-Noun Derivation

If inflection is defined as the part of morphology directly involved in syntactic rules, the class markers of nouns in Niger-Congo languages are unquestionably inflectional. However, noun class systems tend to blur the inflection versus derivation distinction in the sense that, in the Niger-Congo languages that have synchronically active noun class systems, many types of semantic relationships between nominal lexemes commonly expressed cross-linguistically by means of the addition of derivational affixes are rather expressed by means of class/gender alternations. In such cases, the semantically related lexemes share a common stem, and differ only in the class/gender to which they are assigned. The semantic relationships commonly encoded in this way typically include trees and their fruits, individual versus collective, concrete versus abstract, animate entity versus behavior (people vs. language, etc.), and dimension (diminutive, augmentative).

(8)

Tswana (Bantu)

(8a)

cl. 1 / cl. 2	**mʊ̀-sádi** pl. **bà-sádí**	'woman'
cl. 7	**sì-sádí**	'feminine behavior'
cl. 9	**tsʰádí**	'group of women'
cl. 11	**lʊ̀-sádí**	id.
cl. 14	**bʊ̀-sádí**	'womanhood'

(8a)

cl. 3 / cl. 4	**mʊ̀-rɛtɬwá** pl. **mì-rɛtɬwá**	'tree of the sp. moretlwa'
cl. 9 / cl. 10	**tʰɛtɬwá** pl. **dì-tʰɛtɬwá**	'fruit of the moretlwa tree'
cl. 11	**lʊ̀-rɛtɬwá**	'thicket of moretlwa trees'

Example (9) illustrates gender alternations expressing diminutive and augmentative in Jóola Banjal (Atlantic) (Bassène, 2007).

(9) Jóola Banjal (Atlantic; Bassène, 2007)

cl. E / cl. S	**ɛ-jɔba** pl. **sʊ-jɔba**	'dog'
cl. J / cl. M	**jʊ-jɔba** pl. **mʊ-jɔba**	'small dog'
cl. G / cl. B	**ga-jɔba** pl. **ba-jɔba**	'big dog'

The Niger-Congo languages whose noun class system has been drastically reduced (or even completely lost) tend to express the same semantic relationships by means of either derivational affixes, or compounding. For example, names of fruits are often formed by compounding the name of the tree with the noun 'child', and diminutive suffixes originating from the grammaticalization of the same noun 'child' are common.

In fact, such mechanisms also operate, although in a less systematic way, even in languages that have synchronically active noun class systems. For example, Tswana, like the other Southern Bantu languages, does not form diminutives by gender shift, and has a diminutive suffix cognate with the noun 'child' (in present-day Tswana, **ŋw-àná** pl. **b-àná**), as in **tàw-áná** 'lion cub' < **tàú** 'lion'. A little productive feminine / augmentative suffix **-χádí** < Proto-Bantu ***kádí** 'woman' is also found in Tswana, as in **qʰósí** 'king, chief' > **qʰósí-χádì** 'queen', 'chief's wife', or **tàú** 'lion' > **tàú-χádí** 'lioness' or 'big lion'.

Tswana also has a very productive prefix **rá-** (from ** r̀rá** 'father') 'owner of', 'responsible for', 'expert on', as in **rá-mʊ́tsí** 'mayor' < **mʊ̀tsì** 'town', or **rá-mʊ́tɬàkásí** 'electrician' < **mʊ̀tɬàkásí** 'electricity'.

4.4 Verb-to-Noun Derivation

In the Niger-Congo languages whose morphological patterns are commonly viewed as relatively conservative, verb-to-noun derivation typically involves two elements: the addition of a derivational suffix and the addition of class morphology manifesting the assignment of the derived noun to a particular gender, as in Jóola Banjal (Atlantic) **-ffaŋ** 'close' >

(**e-**)**ffeŋ-um** (pl. (**si-**)**ffeŋ-um**) 'key', where **-um** is a derivational suffix used to derive nouns of instruments from verbs, and **e- / si-** are gender-number markers.

It may also happen that no overt derivational element is present, and the deverbal noun is formed by the mere addition of gender-number morphology to a verb stem, as in Jóola Banjal **-mbal** 'fish (V)' > **ɛ-mbal** (pl. **sɪ-mbal**) 'fish-trap'. In such cases (which can be viewed as a particular variety of conversion), the gender to which nouns are assigned may be crucial for the identification of their meaning.

Among the nouns resulting from verb-to-noun derivation processes, the following functional types are particularly widespread: action nouns (as in Tswana **lìm(à)** 'plough' > **tìm-ɔ̀** (9/10) 'ploughing'), result nouns (as in Tswana **bíts(á)** 'call' > **píts-ɔ́** (9/10) 'meeting'), agent nouns (as in Tswana **lìm(à)** 'cultivate' > (**mʊ̀**)**lìm-ì** (1/2) 'farmer'), instrument nouns (as in Tswana **àpàr(à)** 'dress (oneself) > (**sì**)**àpàr-ɔ̀** (7/8) 'garment'), place-of-action nouns (as in Tswana **tɬʰàb(à)** 'slaughter' / (**mà**)**tɬʰàb-ɛ̀lɔ̀** (6) 'abattoir'), and manner nouns (as in Tswana **àpàr(à)** 'dress (oneself) > (**mʊ̀**)**àpàr-ɔ̀** (3/4) 'manner of dressing'). Note that, with the exception of agent nouns (which are generally formed in a way that cannot be used for other semantic types of deverbal nouns), the general tendency is that a given morphological formation may be used for more than one semantic type of deverbal noun, and conversely, variation may occur in the expression of a given semantic type of deverbal noun.

The Niger-Congo languages whose noun class system has been drastically reduced (or even completely lost) may have productive ways of forming deverbal nouns via affixation, but they may also use compounding instead. For example, agent nouns may be formed by compounding verbal lexemes with the noun 'man', names of instruments by compounding verbal lexemes with the noun 'thing', and so forth. In such cases, there is often evidence that the nouns in question are on their way to being grammaticalized as derivational affixes.

4.5 Nominal Compounding

The formation of complex nominal lexemes via compounding (either by combining nominal lexemes, as Mandinka **jàtá** 'lion' + **kùlú** 'skin' > **jàtà-kúlù** 'lion skin', or by combining a nominal lexeme and a verbal lexeme, as Mandinka **mǒo** 'person' + **fǎa** 'kill' > **mòo-fáa** 'murder') is extremely productive in Mande languages, a group of languages whose Niger-Congo affiliation is uncertain—compare among others Creissels (2004) on compounding in Bambara. Mande languages also have very productive patterns of word formation involving both compounding and derivational affixes, as Mandinka **mǒo** 'person' + **fǎa** 'kill' + **-laa** (derivational suffix) > **mòo-fáa-láa** 'murderer'.[10]

Nominal compounding is also productive in languages whose Niger-Congo affiliation is uncontroversial, but in which the noun class system has ceased to be active, leaving only more or less frozen relics. By contrast, in the languages that have synchronically active noun class systems, noun compounding is never very productive, and may be extremely marginal. As regards Bantu, Basciano, Kula, and Melloni (2011) observe that in Bantu lan-

guages, the 'N + N > N' compounding pattern is completely unproductive, and restricted to a few semantic fields, typically kinship terms and phytonyms. As regards the 'N + V > N' compounding pattern, in some Bantu languages (for example, Bemba), it is completely unproductive too, whereas in some others (for example, Swahili), it has some productivity in the formation of agentive or instrumental nouns.

4.6 Verbal Compounding

As a rule, in Niger-Congo languages (including the language groups whose Niger-Congo affiliation is uncertain), the formation of complex verbal lexemes by combining two (or more) verbal lexemes is either totally unknown, or extremely marginal. Igbo (Western Benue-Congo) is an exception. The relatively productive 'V + V > V' compounding pattern of Igbo can be illustrated by **nyà** 'twist' + **gbù** 'kill' > **nyà-gbú** 'strangle', or **cè** 'think' + **fù** 'lose' > **cé-fù** 'forget' (Onumajuru, 1985, pp. 239–242). The so-called serial verb constructions commonly found in Western Benue-Congo and Kwa languages are complex predicates that largely involve lexicalization phenomena typically found in compounds rather than in syntactic combinations of words. They nevertheless cannot be viewed as instances of *morphological* compounding, because the verbal lexemes involved in a serial construction are not necessarily adjacent to each other.

In the language groups that constitute the core of the Niger-Congo phylum, the formation of complex verbal lexemes by combining a verbal lexeme and a nominal lexeme (incorporation) is either totally unknown, or extremely marginal. By contrast, among the language groups whose Niger-Congo affiliation in uncertain, more or less productive incorporation patterns can be found in some Mande languages. In Soninke, two incorporation mechanisms are fully productive: object incorporation, in which the verb is marked as detransitivized (as in **kónpè** 'room' + **séllà** 'sweep' > **kónpó-séllè** 'do room sweeping'), and similative incorporation (as in **hèrê** 'donkey' + **kétú** > **hèrì-n-kétú** 'beat (s.o.) like a donkey', where **-n-** is a linking element). On incorporation in Soninke, see Creissels and Dramé (2016).

Abbreviations

CJ: conjoint, CL: noun class, D: definiteness marker, DJ: disjoint, GEN: genitive, H: high (tone), L: low (tone), N: noun, NP: noun phrase, PL: plural, PRF: perfect, SG: singular, SI: subject index, TAM: tense-aspect-modality, V: verb.

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Notes:

(1.) In descriptions of Bantu languages, agreement classes of noun forms are designated by numbers that refer to the reconstructed Proto-Bantu gender-number marking system (the gender-number markers that characterize Tswana class *x* are reflexes of the gender-number markers of Proto-Bantu class *x*). The numbering of Proto-Bantu classes is arbitrary, but classes 1 and 2 typically include the singular (class 1) and the plural (class 2) of human nouns. Genders are designated by the class pairs to which nouns belong in the singular and the plural (for example, human nouns typically belong to gender 1/2). On the reconstruction of Proto-Bantu morphology, see Meeussen (1967). Unfortunately, this numbering system cannot be extended to all Niger-Congo languages that have a gender-number marking system cognate with the Bantu system, because the Niger-Congo gender-number system has only been partially reconstructed so far. In this article, outside Bantu, agreement classes of nouns are designated by letters or combinations of letters that evoke the phonological form of the markers (cf. section 3.1.1).

(2.) In Mande languages, grammaticalized TAM distinctions are typically expressed by so-called predicative markers rather than by means of verb morphology. The predicative markers of Mande languages are grammatical words that, in Mande clauses, occupy a fixed position immediately after the subject NP, and consequently are not necessarily adjacent to the verb, because the constituent order of Mande clauses is *Subject—Object—Verb—Obliques*.

(3.) In the Seereer forms quoted here, **a-** and **o-** are gender-number markers. Note also that Seereer has a system of consonant gradation account for the **p/b** and **c/j** alternations.

(4.) Toneless languages are mainly found among the Atlantic languages spoken in the western part of Senegal (including Wolof), and among the Bantu languages spoken in the eastern part of Kenya and Tanzania (including Swahili).

(6.) In Tswana and other Southern Bantu languages, this construction involves an obligatory linker preceding the adjective and also expressing gender-number agreement. Historically, this linker is the reflex of a former demonstrative that has lost its semantic content and has become a purely formal element of the construction.

(7.) For a detailed presentation of the derivational processes reconstructed for Proto-Bantu (in particular, verb extensions), see Schadeberg (2003).

(8.) In most Bantu languages, verb forms end with a vowel that must be analyzed as an inflectional ending, because its variations contribute to the identification of the tenses that constitute the verbal paradigm. In particular, Tswana verbs are quoted in a form (the infinitive) that must be segmented as 'verb stem + final vowel **a**'. For example, the stem of the verb quoted as **àpàrà** is **àpàr-**, and the stem of **àpòlà** is **àpòl**-.

(9.) In the examples quoted in this section, the formatives within parentheses are inflectional markers present in the quotation form of lexemes: 'final' (cf. note 5) for verbs, gender-number markers for nouns.

(10.) Note that, in Mandinka, **mǒo** and **fǎa** cannot combine into a verb, and 'killer' would be expressed as **fàa-rì-láa** (not **fàa-láa**), with an addition element **-rì-** whose function is to make it possible not to specify the patient.

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