Noun inflection and gender in Atlantic languages

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Preliminary note. This paper is an updated version of my chapter on noun inflection and gender in Atlantic languages in *The Oxford Guide to the Atlantic Languages of West Africa*.[1] It differs from the published version on the following three points: I have corrected a mistake in my interpretation of the Jaad data provided by Ducos (1971) and Meyer (2001), I have incorporated the information on Pukur and Nalu provided by Rochant (2023) and Seidel (2024), and I have incorporated Saafi data from a document (Mbodj 1983) that was not at my disposal when I wrote the published version of this paper.

1. Introduction

This chapter aims to give a typological overview of the relationship between noun inflection and gender, traditionally analyzed in terms of "noun classes", in the two groups of languages that constitute the Atlantic family, as tentatively delimited by Pozdniakov and Segerer (this volume).

According to Pozdniakov and Segerer (this volume), the Atlantic family as it was delimited by Greenberg (1963) and Sapir (1971) does not constitute a genetically valid grouping within Niger-Congo, and is just an areal grouping of several independent branches of Niger-Congo. The (New) Atlantic family they propose includes the following languages or groups of closely related languages:

1. Fula, Seereer
2. Tenda (Basari, Bedik, Konyagi)
3. Jaad (aka Badiaranke), Biafada
4. Buy (Kobiana, Kasanga), Ñun languages
5. Cangin (Ndut, Palor, Laalaa, Noon, Saafi)
6. Wolof
7. Jóola languages (including Bayot)
8. Manjaku, Mankanya, Pepel
9. Balant
10. Bijogo
11. Naluic (Nalu, Mbulungish (aka Baga Fore), Pukur (aka Baga Mboteni))

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[1] Denis Creissels. 2024. Noun inflection and gender in Atlantic languages. In Friederike Lüpke (ed.), *The Oxford Guide to the Atlantic Languages of West Africa*. 463-482.

Mel (Temne, Landuma, Baga Koba, Baga Maduri, Baga Sitemu, Sherbro, Krim, and Kisi) is considered a separate family;[2] Limba, Sua, and Gola are considered Niger-Congo isolates.

Most Atlantic languages have gender systems of the type commonly designated as "noun class systems", and among the Atlantic languages for which the relevant information is available, Palor, Ndut and Pukur are the only ones that do not have synchronically active gender systems.

The chapter is organized as follows. Section 2 sets the theoretical framework. Section 3 is about the relationship between agreement patterns and noun morphology. Section 4 discusses some particular aspects of Atlantic gender systems. Section 5 describes the cross-linguistic variation in the range of constructions in which gender-number agreement operates. Section 6 is about the non-contextual use of classes and the classes that have no potential controller. Section 7 discusses semantic agreement. Section 8 analyzes the situation of the Atlantic languages whose gender-number agreement system has undergone radical change or has disappeared. Section 9 summarizes the main conclusions.

2. Conceptual and terminological clarifications

2.1. Niger-Congo "noun class systems"

Traditionally, Niger-Congo languages (including Atlantic languages) are not characterized as having "genders", but rather "noun classes". However, as argued by Corbett (1991), among others, if gender as a morphosyntactic notion (grammatical gender) is defined as a particular type of nominal classification in which a partition of the set of nominal lexemes into subsets manifests itself in agreement mechanisms controlled by nouns, then Niger-Congo "noun class systems" are uncontroversial gender systems in which gender agreement operates in noun-modifier constructions, in the relationship between pronouns and their antecedents, and in the indexation of arguments on verbs.

Niger-Congo gender systems show a number of properties that distinguish them from the gender systems found elsewhere in the world. They are multiple-gender systems (as opposed to binary or ternary gender systems) in which sex (male vs. female) plays no role in gender assignment. Formally, their most salient characteristics is the close relationship between genders and inflectional types of nouns.[3]

In typical Niger-Congo gender systems, the overwhelming majority of common nouns have two distinct singular and plural forms, and the nouns having distinct singular and plural forms divide into inflectional types characterized by a particular pair of obligatory number markers each.[4] Most nouns show overt number markers both in the singular and the plural, and the stem to which number markers attach does not exist by itself as a word.[5] As a rule,

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[2] On Mel languages, see Childs (this volume).

[3] In this article, I use "inflectional type" instead of the more usual term "inflectional class" in order to prevent any risk of confusion between "class" as a mere synonym of "subset" and "class" in the technical sense defined in §2.2.

[4] The extension of the notion of inflectional type to the nouns that do not have distinct singular and plural forms is discussed in §3.2.

[5] In languages in which equipollent marking of number is the general rule, the overall organization of the system justifies positing a phonologically null singular prefix in nouns such as Ganja *bójà* 'village', plural *g-bójà*, and a phonologically null plural prefix in nouns such as Ganja *b-tá* pl. *tá* 'tree'.

lexemes belonging to the same inflectional type belong also to the same gender (i.e., control the same agreement forms), but it is not uncommon that the nouns belonging to a given gender divide into two or more inflectional types. Gender-number agreement is expressed via markers (conventionally referred to as CLASSES) that may be more or less similar to the number markers of nouns. Agreement markers are portemanteau morphemes: they cannot be decomposed into a number agreement marker and a gender agreement marker.

2.2.   The notion of class

In Niger-Congo gender systems, genders and inflectional types are closely related, but exact coincidence between inflectional types and genders hardly ever occurs. A major shortcoming of the traditional notion of "noun class" is that it only makes sense in an idealized situation which is never found in real languages, and is consequently not suited for the description of intricacies in the relationship between number inflection and gender that are pervasive in Niger-Congo gender systems.

As discussed in detail by Güldemann & Fiedler (2017), the traditional notion of noun class is characterized by the lack of a clear distinction between inflection and agreement. Crucially, the inflectional number markers on nouns and the gender-number agreement markers in the inflection of the words that are the target of gender-number agreement are indiscriminately called "noun class markers", which impedes consistent treatment of the mismatches between inflectional characteristics and agreement properties of nouns.

In order to clarify the situation, in this chapter, the term class is not used for sets of nouns, be it with reference to their agreement properties or inflectional characteristics, but exclusively with the meaning of CELL IN THE INFLECTION OF THE WORDS THAT CAN ACT AS TARGETS OF AGREEMENT MECHANISMS CONTROLLED BY NOUNS. This definition implies that:

- if a noun combines with a modifier inflected for class, the class value expressed by the modifier is determined by the noun; for example, in Jóola Fóoñi, the indefinite determiner 'some' can only be the class A form *a-cɛɛn* if its head is *a-ñɪl* 'child', the class K form *kʊ-cɛɛn* if its head is *ka-laak* 'field', etc.
- if a pronoun inflected for class refers to an antecedent present in the context, it is the antecedent that determines the class value expressed by the pronoun; for example, in Jóola Fóoñi, the third person pronoun can only take the class K form *k-ɔɔ* if its antecedent is *ka-laak* 'field', the class B form *b-ɔɔ* if its antecedent is *bʊ-rʊŋ* 'road', etc.

However, this definition does not necessarily imply that class-marking on a potential agreement target is always due to an agreement relation. This is indeed crucial, since some of the inflected forms of the words in question may have NON-CONTEXTUAL uses implying no reference to a controller – see §6.2.

By definition, classes (with the exception of the orphan classes – see §6.3) are the basis of the partition of noun forms into subsets according to their agreement properties. However, the relationship between classes in the sense defined above and subsets of nouns may show some complexity, in the languages that have the phenomenon known as semantic agreement – see §7.

As regards the labeling of individual classes in individual languages, Atlantic languages do not lend themselves to the elaboration of a system similar to that used in Bantu linguistics, in which the numbering of classes identifies them as reflexes of reconstructed Proto-Bantu classes, since the reconstructions proposed for the Proto-Atlantic class system are so far only fragmentary. On the other hand, semantically motivated labels would be impossible to deal with consistently, given that, in Atlantic languages (as elsewhere in Niger-Congo), most of the subsets of nouns sharing a given behavior as agreement controllers are semantically heterogeneous to a large extent. In fact, the only practical and non-confusing solution is the use of language-specific and phonetically motivated labels that simply evoke the phonological shape of (the majority of) the markers involved in a given agreement pattern, as illustrated in the class paradigms presented in (2), (4) and (5) below.

2.3. Classes and number

Classes as defined above are not necessarily bound to a unique number value. In Niger-Congo languages in general, and in Atlantic languages in particular, it is not uncommon that a given agreement pattern is shared by the singular forms of a given gender and the plural forms of another gender. Example (1) shows that, in Jóola Fóoñi, the noun prefix *k-* and the agreement pattern K are shared by the singular forms of the nouns of gender K–U and the plural forms of the nouns of gender F–K: *k-ɔɔl* 'bone' (plural *w-ɔɔl*) and *k-al* 'rivers' (plural of *f-al*), in spite of their different number value, have identical prefixes and govern the same agreement pattern.

(1)   Jóola Fóoñi[6]

(1a)   *k-ɔɔl*   *k-ɛɛmɛk*   *ʋ-k-a*   'that big bone'
        SG-bone(K)   clK-big   DEM-clK-DIST
        cf. pl. *w-ɔɔl w-ɛɛmɛk ʋ-w-a* 'those big bones'

(1b)   *k-al*   *k-ɛɛmɛk*   *ʋ-k-a*   'those big rivers'
        PL-river(K)   clK-big   DEM-clK-DIST
        cf. sg. *f-al f-ɛɛmɛk ʋ-f-a* 'that big river'

One may speculate about the historical scenarios that may be responsible for such situations, but this is another question, which will not be addressed in this chapter.

2.4. Singular/plural, collective, and the question of "uncountable plurals"

In many Atlantic languages, some noun stems (in particular among those referring to fruits, small objects such as pearls, feathers, seeds, and small animals such as insects or rodents) display three forms: one singular form and two forms referring to groups of individuals of the given category – see Cobbinah (this volume) for more details. Cobbinah and Lüpke (2014) have proposed to characterize such pairs of forms referring to groups as COUNT PLURAL (compatible with numerals) and UNCOUNTABLE PLURAL (incompatible with numerals, also

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[6] The Jóola Fóoñi data quoted in this chapter come from my own work on Jóola Fóoñi in collaboration with Alain Christian Bassène and Boubacar Sambou.

called UNLIMITED PLURAL). One may, however, wonder to what extent "uncountable/unlimited plurals" really deserve to be analyzed differently from the collective nouns as traditionally analyzed in other languages (i.e., as an instance of N>N derivation).

For example, a triad such as Jóola Fóoñi *a-manɪŋa* 'Mandinka person' / *kʊ-manɪŋa* 'Mandinka persons' / *ɛ-manɪŋa* 'the Mandinka community' can be analyzed as involving a noun of gender A–BK referring to individuals *a-manɪŋa* / *kʊ-manɪŋa*, and a related collective noun *ɛ-manɪŋa* which is grammatically a singulare tantum of gender E–S. Similarly, *ba-jangata* 'peanuts' can be analyzed as a singulare tantum of gender B–U that constitutes the collective noun corresponding to *fʊ-jangata* / *kʊ-jangata* (gender F–K).

This said, it is perfectly possible to account for the same facts in terms of triadic genders. In Jóola Fóoñi and other languages I am relatively familiar with, I fail to see the advantages that the hypothesis of an inflectional category of number with three possible values may have, but the uncountable/unlimited plural analysis, which goes back to Sauvageot (1967), deserves to be considered at least for Nyun languages, where the forms in question have a number of properties that are arguably better accounted for within the uncountable/unlimited plural analysis. In Nyun languages, the form for which the uncountable/unlimited plural analysis has been proposed is for many nouns the form first given in elicitation, the form used for generic reference, and the most frequent form in discourse, by far more frequent than the plural and the singular, which for such nouns semantically corresponds to a singulative. In addition, it occurs with plural subject agreement markers on the verb. However, in Nyun languages, verbs express number agreement with a binary singular vs. plural distinction, not a ternary distinction, as could be expected in languages with a fully grammaticalized ternary number distinction in noun inflection.

2.5. Three examples of class paradigms

In Ganja (Balant) the inflectional paradigm of the words that agree with nouns, illustrated in (2), consists of 7 classes, each of which occurs in contexts in which it expresses agreement with a particular subset of noun forms in the role of head or antecedent.

(2)   Examples of adnominals inflected for class in Ganja (Balant)[7]

	-ílà 'which'	*-ndâŋ* 'big'	*-ɔ́* 'this'	*-ɔ́lɔ̀* 'other'
class HA	*h-ílà*	*à-ndâŋ*	*h-ɔ́*	*h-ɔ́lɔ̀*
class BI	*bìg-ílà*	*bì-ndâŋ*	*b-ɔ́-gì*	*bìg-ɔ́lɔ̀*
class B	*b-ílà*	*m-ndâŋ*	*b-ɔ́*	*b-ɔ́lɔ̀*
class U	*w-ílà*	*ʊ̀-ndâŋ*	*w-ɔ́*	*w-ɔ́lɔ̀*
class GI	*g-ílà*	*gì-ndâŋ*	*g-ɔ́*	*g-ɔ́lɔ̀*
class F	*f-ílà*	*f-ndâŋ*	*f-ɔ́*	*f-ɔ́lɔ̀*
class G	*g-ílà*	*ŋ-ndâŋ*	*g-ɔ́*	*g-ɔ́lɔ̀*

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[7] The Ganja data quoted in this chapter come from my own work on Ganja in collaboration with Séckou Biaye (Creissels & Biaye 2016).

As illustrated in (3) with the adjective *-ndâŋ* 'big, great', four of the seven classes (HA, GI, B, and F) express agreement with singular noun forms, two (BI and G) express agreement with plural noun forms, and one (U) is found with both singular and plural controllers.

(3)   Ganja (Balant)

class HA	*à-ndàantí*	*à-ndâŋ*	'great hunter'
	SG-hunter(HA)	clHA-great	
class GI	*gì-gbél*	*gì-ndâŋ*	'big spoon'
	SG-spoon(GI)	clGI-big	
class B	*b-săay*	*m-ndâŋ*	'big silk-cotton tree'
	SG-silk.cotton.tree(B)	clB-big	
class F	*f-dùngí*	*f-ndâŋ*	'big pot'
	SG-pot(F)	clF-big	
class BI	*bì-ndàantí*	*bì-ndâŋ*	'great hunters'
	PL-hunter(BI)	clBI-great	
class G	*g-dùngí*	*ŋ-ndâŋ*	'big pots'
	PL-pot(G)	clG-big	
	g-bàlá	*ŋ-ndâŋ*	'big xylophones'
	PL-xylophone(G)	clG-big	
class U	*Ø-bàlá*	*ò-ndâŋ*	'big xylophone'
	SG-xylophone(U)	clU-big	
	Ø-gbél	*ò-ndâŋ*	'big spoons'
	PL-spoon(U)	clU-big	
	Ø-săay	*ò-ndâŋ*	'big silk-cotton trees'
	PL-silk.cotton.tree(U)	clU-big	

Guñaamolo (Ñun; Bao Diop 2015) has a much more diversified class paradigm, with 26 distinct cells, each of which expressing agreement with a particular subset of noun forms.

(4)   Examples of adnominals inflected for class in Guñaamolo (Ñun)

	-de 'big'	*-lɪɪh* 'first'	*-mɐr* 'that'	relativizer
class A	*ɐ-de*	*a-lɪɪh*	*no-mɐr*	*nɔ*
class BA	*bɐ-de*	*ba-lɪɪh*	*bɐ-mɐr*	*ba*
class BI	*bi-de*	*bɪ-lɪɪh*	*bi-mɐr*	*bɪ*
class BU	*bu-de*	*bʊ-lɪɪh*	*bu-mɐr*	*bʊ*
class DA	*dɐ-de*	*da-lɪɪh*	*dɐ-mɐr*	*da*
class DI	*di-de*	*dɪ-lɪɪh*	*di-mɐr*	*dɪ*
class DIN	*din-de*	*dɪn-lɪɪh*	*dim-mɐr*	*dɪŋ*
class FA	*fɐ-de*	*fa-lɪɪh*	*fɐ-mɐr*	*fa*
class FU	*fu-de*	*fʊ-lɪɪh*	*fu-mɐr*	*fʊ*
class GU	*gu-de*	*gʊ-lɪɪh*	*gu-mɐr*	*gʊ*
class HA	*hɐ-de*	*ha-lɪɪh*	*hɐ-mɐr*	*ha*
class HO	*ho-de*	*hɔ-lɪɪh*	*ho-mɐr*	*hɔ*

class IN	*in-de*	*ɪn-lɪɪh*	*im-mɐr*	*mɪ*
class JA	*jɐ-de*	*ja-lɪɪh*	*jɐ-mɐr*	*ja*
class JI	*ji-de*	*jɪ-lɪɪh*	*ji-mɐr*	*jɪ*
class KA	*kɐ-de*	*ka-lɪɪh*	*kɐ-mɐr*	*ka*
class KO	*ko-de*	*kɔ-lɪɪh*	*ko-mɐr*	*kɔ*
class KUN	*kun-de*	*kʊn-lɪɪh*	*kum-mɐr*	*kʊ*
class MUN	*mun-de*	*mʊn-lɪɪh*	*mum-mɐr*	*mʊ*
class ÑAN	*ñɐn-de*	*ñan-lɪɪh*	*ñam-mɐr*	*ña*
class ÑO	*ño-de*	*ñɔ-lɪɪh*	*ño-mɐr*	*ñɔ*
class RAN	*rɐn-de*	*ran-lɪɪh*	*rɐm-mɐr*	*ra*
class SI	*si-de*	*sɪ-lɪɪh*	*si-mɐr*	*sɪ*
class TA	*tɐ-de*	*ta-lɪɪh*	*tɐ-mɐr*	*ta*
class TI	*ti-de*	*tɪ-lɪɪh*	*ti-mɐr*	*tɪ*
class U	*u-de*	*ʊ-lɪɪh*	*u-mɐr*	*mʊ*

The inflectional paradigm of Jóola Fóoñi adnominals and pronouns consists of 15 cells. However, two of them (class D and class N) are orphan classes that have no potential controller and only occur in non-contextual uses – see §6.3. Moreover, class N is defective, in the sense that not all adnominals and pronouns have a class N form, and the class BK and class K forms are homonymous in most paradigms.

(5)   Examples of adnominals inflected for class in Jóola Fóoñi

	ʊ-a 'that'	*-an* relativizer	*-cɛɛn* some
class A	*ʊ-m-a*	*Ø-an*	*a-cɛɛn*
class BK	*(b-)ʊ-k-a*	*k-an*	*kʊ-cɛɛn*
class E	*ʊ-y-a*	*y-an*	*ɛ-cɛɛn*
class S	*ʊ-s-a*	*s-an*	*sɪ-cɛɛn*
class B	*ʊ-b-a*	*b-an*	*bʊ-cɛɛn*
class U	*ʊ-w-a*	*w-an*	*ʊ-cɛɛn*
class F	*ʊ-f-a*	*f-an*	*fʊ-cɛɛn*
class K	*ʊ-k-a*	*k-an*	*kʊ-cɛɛn*
class J	*ʊ-j-a*	*j-an*	*jɪ-cɛɛn*
class M	*ʊ-m-a*	*m-an*	*mʊ-cɛɛn*
class Ñ	*ʊ-ñ-a*	*ñ-an*	*ñɪ-cɛɛn*
class T	*ʊ-t-a*	*t-an*	*tɪ-cɛɛn*
class D[8]	*ʊ-r-a*	*d-an*	*dɪ-cɛɛn*
class D´	*u-r-ɐ*	*d-ɐn*	*di-ceen*
class N	—	*n-an*	*nɪ-cɛɛn*

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[8] In Jóola Fóoñi, the contrast between *d* and *r* is limited to relatively recent borrowings. In the markers of classes D and D´, *d* and *r* are in free variation.

3. Agreement patterns and noun morphology

3.1. Singular vs. plural in noun inflection and agreement

The complexity of the relationship between singular and plural, both in nominal inflection and in agreement patterns, is a typical feature of the Niger-Congo languages having a gender system:

– nouns that have the same inflectional marker and agreement pattern in the singular may have different inflectional markers and agreement patterns in the plural, and vice-versa;
– the same inflectional marker may express singular with some nouns, and plural with others;
– a given agreement pattern may be shared by a subset of singular forms and a subset of plural forms.
– not all nouns have distinct singular and plural forms,
– some agreement patterns may be triggered exclusively by nouns that do not have distinct forms for singular and plural.

Outside Niger-Congo, it is common practice to use simple labels (such as 'masculine' or 'feminine') for genders, and to add the specification 'singular' or 'plural' when referring to the agreement patterns governed by noun forms. For Niger-Congo systems, a simpler description associates simple labels with the classes through which the agreement patterns materialize and the subsets of noun forms that govern them, and analyzes genders as pairs of agreement patterns governed by the singular and plural forms of a noun respectively.

Crucially, in Niger-Congo languages (and especially in Atlantic languages), it is normally easy to establish the inventory of distinct agreement patterns available for noun forms; by contrast, the variation in singular-plural pairings is such that it is often difficult if not impossible to establish with precision the exact number of distinct genders that should be recognized in a given language.

Closely related languages, for example Jóola Fóoñi and Jóola Keeraak, may have identical inventories of agreement patterns for noun forms, but very different inventories of genders. Based on identical inventories of 13 possible agreement patterns for noun forms, Jóola Fóoñi has 6 major genders and 5 statistically marginal genders (see §3.5 below), whereas 8 major genders and 14 statistically marginal genders can be identified in the data provided by Segerer (2015) for Jóola Keeraak. In such situations, in the perspective of language comparison, the advantages of using simple labels for the agreement patterns available for noun forms and complex labels for genders, rather than the other way round, are particularly obvious.

Moreover, some classes may be problematic with respect to the singular vs. plural contrast. For example, in Wolof, the class inflection of adnominals consists of ten classes traditionally divided into eight singular classes (K, B, W, M, G, J, L, and S) and two plural classes (K and Y). However, according to Babou & Loporcaro (2016), some of the noun forms triggering J or S agreement, traditionally analyzed as collectives, are in fact plural forms, which leads to the recognition of two genders (B–J and B–S) that are not mentioned in previous descriptions of Wolof.

Historically, there is ample evidence that a major source of complexification of the singular-plural correspondences is the reanalysis of collective nouns as plural forms that replace the original plural form of the noun from which they derive. For example, in Jóola Fóoñi, *ba-ñʋl* (roughly equivalent to French *marmaille* 'group of (unruly) children') is the collective noun corresponding to *a-ñʋl / kʋ-ñʋl* 'child / children', whereas in Jóola Keeraak, *ba-ñʋl* 'children' is the plural of *a-ñʋl* 'child'. One may imagine that variation in the status of some noun forms as plurals or collectives is responsible for the controversy about Wolof genders.

The relationship between singular and plural in Atlantic gender systems can be captured by means of diagrams such as (6), in which the left column lists the agreement patterns corresponding to singular noun forms, the right column lists the agreement patterns corresponding to plural noun forms, and the lines between the two columns indicate the possible pairings (i.e., genders). The dotted lines mark statistically marginal pairings. The notation U/HA refers to a set of singular noun forms governing a hybrid agreement pattern in which some agreement targets show class U agreement, and others class HA agreement (see §7.1).

(6)   Singular-plural pairings in the gender system of Ganja (Balant)
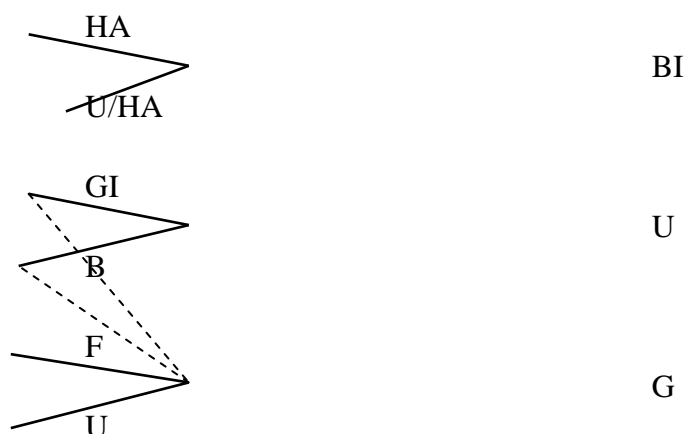
The repetition of U in the left and right columns is due to the fact that agreement pattern U is triggered by two sets of noun forms, a set of singular forms corresponding to plurals triggering G agreement (such as *Ø-bójà* 'village', plural *g-bójà*), and a set of plural forms corresponding to singulars governing GI agreement (such as *Ø-hájè̀*, plural of *gì-hájè̀* 'well') or B agreement (such as *Ø-sǎay*, plural of *b-sǎay* 'silk-cotton tree').

Similar diagrams can be used to represent the possible pairings of number markers.

The complexity of the singular/plural correspondences varies greatly from one language to another, but the singular markers and agreement patterns always outnumber the plural ones.

In some languages (Fula, Cangin languages, Balant), with very few exceptions, the plural marker of a noun and its agreement pattern in the plural can be predicted from its singular marker and agreement pattern in the singular. In contrast, some other languages

(Joola Keeraak, Bayot, Manjaku, Ñun-Buy languages) show a proliferation of possible pairings.[9]

3.2. Nouns that do not vary in number, and the notion of obligatory noun marker

The typical situation in Atlantic languages is that the minimal form of the overwhelming majority of common nouns consists of a stem and an obligatory number marker, either singular or plural. However, there is always a non-negligible minority of nouns that do not have distinct singular and plural forms, such as Jóola Fóoñi *mʊl* 'breast milk', *mɔf* 'earth', *jɐkuut* 'thievery', or *sambʊn* 'fire'.

In most cases, comparison with semantically related lexemes (either nouns or verbs) makes it possible to identify an affix occupying the same position as the obligatory number marker in the nouns that have distinct singular and plural forms.

For example, in Jóola Fóoñi, comparison with *f-ʊl* pl. *k-ʊl* 'breast (of a woman)' makes it possible to decompose *mʊl* 'breast milk' as *m-ʊl*, and comparison with the verb stem *kuut* 'steal' makes it possible to decompose *jɐkuut* 'thievery' as *jɐ-kuut*.

Crucially, such affixes are related to the agreement system exactly like the number markers of the nouns that have distinct singular and plural forms, and are most of the time homonymous with number markers associated with the same agreement pattern. In Jóola Fóoñi, *m-* is the plural prefix of gender J–M nouns such as *j-ʊʊl* pl. *m-ʊʊl* 'fanpalm'. Since *m-ʊl* 'breast milk' triggers agreement pattern M, analyzing it as a plurale tantum of gender J–M greatly simplifies the description.

In the case of *jɐ-kuut*, *jɐ-* does not coincide with a number prefix, but all the invariable nouns in which a prefix *jɐ-* can be isolated trigger J agreement, and consequently can be analyzed as singularia tantum of gender J–M, although their prefix is different from the singular prefix of the J–M nouns that have a plural form.

There may also be a small minority of common nouns for which there is no direct proof of a segmentation into a stem and an obligatory affix related to the agreement system, but whose initial (in languages having prefixed number markers) or final (in languages having suffixed number markers) is identical to a marker isolable in other nouns triggering the same agreement pattern. For example, in Jóola Fóoñi, *m-ɔf* earth' differs from *m-ʊl* 'breast milk' in that no other word confirms the existence of a stem *ɔf*. However, *m-ɔf* triggers the same agreement pattern M as *m-ʊl*, and consequently, identifying its initial as the plural prefix of the nouns of gender J–M simplifies the description. Similarly, *s-ambʊn* 'fire' triggers the same agreement pattern S as for example *s-aan* 'branches' (plural of *y-aan* 'branch'), and consequently can be analyzed as a plurale tantum of gender E–S, although there is no direct confirmation of the existence of a stem *ambʊn*.

To summarize, a simple description of the relationship between genders and noun morphology can only be achieved by positing that all common nouns include an OBLIGATORY NOUN MARKER (henceforth ONM), even if, for a limited number of nouns, this marker cannot be isolated by means of the classical procedures of morphological analysis. In this chapter, the ONMs found in nouns that do not have distinct singular and plural forms are glossed SG or

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[9] Note, however, that, as argued by Cobbinah (this volume), once the meaning of the root is taken into consideration, the proliferation of possible singular-plural pairings does not necessarily challenge the possibility of predicting the characteristics of the plural form of nouns from those of their singular form.

PL if they are also found in nouns having distinct forms for singular and plural, NN ('number-neutral') if they are only found in nouns that do not have distinct singular and plural forms.

As regards the position of ONMs within noun forms, among North Atlantic and Bak languages, Fula is the only language having ONMs suffixed to noun stems. Some Atlantic languages (in particular Wolof and Sereer) are sometimes mentioned as having "class markers" suffixed to nouns, but the markers in question are in fact the agreement markers of a syntactically optional determiner. For example, in Sereer, *o-ɓox ol-e* 'the dog' and *a-cek al-e* 'the hen' have been analyzed as involving "circumfixes" (*o-...-ol* and *a-...-al* respectively), but this analysis is unsustainable, since *o-ɓox* 'dog' and *a-cek* 'hen' are perfectly viable noun phrases, and adjectives can be inserted between the noun and the definite article (cf. *o-ɓox o-faax ol-e* 'the good dog' and *a-cek a-paax al-e* 'the good hen').

3.3. Stem-initial alternations triggered by ONMs and class markers

In many North Atlantic languages (Seereer, Kobiana, Kasanga, Tenda languages, Jaad, and Biafada), the affixation of ONMs and agreement markers involves systematic stem-initial alternations.

Stem-initial alternations typically involve a division of 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. However, they are morphologicized to a considerable extent, and the analysis of the underlying processes (be it in synchronic or diachronic perspective) is not an easy task. For a discussion of the historical origin of this phenomenon, see Pozdniakov (2015), Merrill (2018).

As illustrated in (7), it may happen that markers surfacing as identical segments (as o_I- and o_{III}- in (7a)) interact differently with the initial of the stem, and the form taken by the initial of the stem may be the only exponent of some ONMs and/or classes, as in (7b).[10]

(7)   Seereer (elicited)

(7a) o_I-**jisiis** o_I-**faax**   'good sparrow'
        xa_{II}-**cisiis** xa_{II}-**paax**   'good sparrows'
        o_{III}-**njisiis** o_{III}-**mb**aax   'good small sparrow'

(7b) $Ø_{III}$-**ngiic** o_{III}-**mb**aax   'good jujube-tree'
        $Ø_{II}$-**kiic** $Ø_{II}$-**paax**   'good jujube-trees'
        o_I-**hiic** o_I-**faax**   'good jujube'

Interestingly, stem-initial alternations are also productive in Fula, the only Atlantic language in which the ONMs are suffixed to noun stems. This can be viewed as evidence that, in the history of Fula, the grammaticalization of former articles as suffixed ONMS has compensated the loss of a more ancient system of prefixed ONMs.

3.4. The question of "alliterative agreement"

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[10] In this example, subscript roman numbers after prefixes refer to the series to which the initial consonant of the stem must belong.

According to a tenacious legend, "alliterative agreement" is a distinctive feature of Niger-Congo "noun class systems".

As discussed by Corbett (2006: 87–90), the term alliterative agreement can be understood as referring to situations where agreement markers on targets are phonologically identical to the corresponding inflectional markers on controllers. In this sense, Niger-Congo systems are partially alliterative, since they involve both class markers phonologically identical to the inflectional markers of nouns, and class markers showing no similarity with the corresponding noun inflections. There is nothing particularly exotic in that, since Indo-European and Afroasiatic systems show a similar mix or alliterative and non-alliterative agreement.

In a more restrictive view of alliterative agreement, characterized by Corbett as RADICAL ALLITERATIVE AGREEMENT, this term refers to situations where targets systematically take agreement markers copying the initial or the ending of their controller, regardless of the morphological status of the copied material.

In the general literature on agreement, partial and wrongly interpreted Guñaamolo data provided by Sauvageot (1967) have played a prominent role in discussions of radical alliterative agreement (see in particular Dobrin 1995). However, as discussed by Cobbinah (2017), the recent descriptions of Guñaamolo and other Ñun languages (Bao Diop 2015, Quint 2015, Cobbinah 2013) have put an end to this myth. Example (8) illustrates instances of non-alliterative agreement in Guñaamolo.

(8)   Guñaamolo (Bao Diop 2015, 378-379)

(8a)   ***ʊ-dɪkaam-ɔ***   ***mɔ-ŋɔɔn***
       SG-woman(U)-D   clU-that
       'that woman'

(8b)   ***a-yɔm-ɔ***   ***nɔ-ŋɔɔn***
       SG-bee(A)-D   clA-that
       'that bee'

Guñaamolo is remarkable for its very large inventory of ONMs and agreement patterns, but its agreement system is an unremarkable partially alliterative system similar to those found all across Niger-Congo (and elsewhere).

3.5. Inflectional types of nouns and genders: an illustration

Jóola Fóoñi has 13 distinct agreements patterns for noun forms, and 19 prefixes whose combination with nominal stems yields the minimal form of nouns.[11]

The 17 prefixes listed in (9a) unequivocally determine the agreement pattern and number value of the noun forms they mark, whereas each of 2 prefixes presented in (9b) is found in two sets of noun forms differing in their agreement pattern. A dash in the 'number value' column indicates prefixes only found in nouns that do not have distinct forms for

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[11] This count relies on analytical decisions that are not always obvious. The analysis presented here is the one I consider the simplest and most consistent one, but a discussion of the problematic points would necessitate more space than available.

singular and plural. The forms noted in (9) are underlying forms whose realization is subject to morphophonological rules.

(9)   The ONMs of Jóola Fóoñi

(9a)   ONMs compatible with a single agreement pattern

ONM	agreement	number value
a-	A	sg.
ɛ-	E	sg.
f-	F	sg.
fa-	F	–
ka-	K	sg.
b-	B	sg.
ba-	B	sg.
ñ-	Ñ	sg.
j-	J	sg.
ja-	J	–
bʊk-	BK	pl.
s-	S	pl.
ʊ-	U	pl.
m-	M	pl.
ma-	M	–
t-	T	–
d´-	D´	–

(9b)   ONMs compatible with two agreement patterns

ONM	agreement	number value
Ø-	A or E	sg.
k-	BK or K	pl.

The plural prefix *bʊk-* is found with just one noun (*Ø-an* 'person' plural *bʊk-an*). All the other (non-diminutive) human nouns have the same plural prefix (*k-*) as the non-human nouns whose singular prefix is *f-*, although the agreement patterns are different.

   5 of the 19 ONMs (*fa-*, *ja-*, *ma-*, *t-*, and *d´-*) are intrinsically number-neutral, but, with the exception of those only found with human nouns (singular *a-* and plural *bʊk-*), all the other prefixes can also be found in nouns that do not have distinct singular and plural forms. For example, *bʊ-fal* 'hairs' (a collective noun corresponding to *ka-fal* 'hair pl. *ʊ-fal*) is a singulare tantum, since *bʊ-* is in principle a singular prefix, whereas *w-aaf* 'thing' is a plurale tantum, since *w-* (variant of *ʊ-* with vowel-initial stems) is in principle a plural prefix.

   Interestingly, some of the nouns that do not vary in number (but not all) may nevertheless be modified by numerals, without any change in their prefix and agreement pattern, as for example *s-ɐuut* 'dream', whose prefix is in principle a plural prefix: *s-ɐuut s-ɐkon* 'one dream', *s-ɐuut sɪ-gaba* 'two dreams' (compare with *y-ɔn y-ɐkon* 'one crocodile',

s-ɔn sɪ-gaba 'two crocodiles'). The same behavior is found with the prefixes *t-* and *d´-*, to which no number value can be attributed: *t-ɪn t-ɐkon* 'one place', *t-ɪn tɪ-gaba* 'two places'.

For the nouns that have distinct singular and plural forms, taking into account both number marking and agreement patterns, 14 singular-plural pairings, listed in (10), can be established.

(10)   Singular-plural pairings in Jóola Fóoñi

singular		plural		examples		
Ø-	(A)	bʊk-	(BK)	Ø-an	pl. *bʊk-an*	'person'
Ø-	(A)	k-	(BK)	Ø-ɪñaay	pl. *k-ɪñaay*	'mother'
a-	(A)	k-	(BK)	a-sɛɛk	pl. *kʊ-sɛɛk*	'woman'
a-	(A)	s-	(S)	a-mpa	pl. *sʊ-mpa*	'father'
Ø-	(A)	s-	(S)	Ø-ɪñaay	pl. *s-ɪñaay*	'mother'
ɛ-	(E)	s-	(S)	e-suk	pl. *si-suk*	'village'
Ø-	(E)	s-	(S)	Ø-sindo	pl. *si-sindo*	'home'
b-	(B)	ʊ-	(U)	bʊ-rʊŋ	pl. *ʊ-rʊŋ*	'road'
ba-	(B)	ʊ-	(U)	ba-caac	pl. *ʊ-caac*	'bed'
f-	(F)	k-	(K)	fʊ-lɛɛŋ	pl. *kʊ-lɛɛŋ*	'moon, month
ka-	(K)	ʊ-	(U)	ka-sɔnd	pl. *ʊ-sɔnd*	'roof'
j-	(J)	m-	(M)	jɪ-bɛcɛl	pl. *mʊ-bɛcɛl*	'palm tree'
j-	(J)	k-	(K)	ji-cil	pl. *ku-cil*	'eye'
ñ-	(Ñ)	ʊ-	(U)	ñɪ-wʊj	pl. *ʊ-wʊj*	'chain'

Taking into account agreement patterns only, 9 genders can be recognized (A–BK, A–S, E–S, B–U, F–K, K–U, J–M, J–K, and Ñ–U). However, 3 of them (A–S, J–K, and Ñ–U) are statistically marginal.

In addition to the 9 binary genders illustrated in (10), the agreement patterns T and D´ constitute a distinct gender each, since they are only found with the following nouns, none of which shows variation in number: *t-ɪn ~ t-an* 'place delimited with some precision' for gender T, *d-in ~ d-ɐn* 'place conceived as a closed space' for gender D´.

4.   Aspects of the gender system

4.1.   The semantic content of genders

As a rule, Atlantic genders are semantically heterogeneous, although concentrations of particular semantic types of nouns in particular genders are often observed, for example, the concentration of names of trees in a particular gender (B–U in Jóola languages, G–B in Wolof, etc.). However, the reverse is not true, since the genders in question also include nouns with very different types of lexical meaning. In Jóola Fóoñi, gender B–U also includes the nouns for 'road', spirit', 'rice field, 'shadow', 'face, 'nest', 'custom', 'hole', 'corpse', 'chest', etc.

Unsurprisingly, examples of semantically homogeneous genders are easier to find in languages with a high number of genders than in languages with a small number of genders.

Given that the present chapter focuses on formal aspects of nominal inflection and gender, the discussion of the semantic regularities in gender assignment will be limited to the semantic distinctions having a direct impact on agreement mechanisms. For detailed discussion of the semantic regularities in gender assignment, see Cobbinah (this volume).

4.2. Humanness in Atlantic gender systems

4.2.1. Atlantic gender systems including a human gender

Niger-Congo gender systems are not sensitive to the male vs. female distinction, but typically include a HUMAN GENDER showing the following characteristics:

– all of the nouns that belong to the human gender denote humans;[12]
– most nouns denoting humans if not all (in particular, basic terms such as 'human being', 'man', 'woman', 'child', 'old person', and all agent nouns derived from verbs) are found in the human gender;
– as agreement controllers, personal names behave like the singular form of common nouns belonging to the human gender, whereas coordinations of human names, or human names combined with an associative plural marker, behave like the plural form of common nouns belonging to the human gender;
– human singular and human plural forms of adnominals used pronominally may be used, independently of any contextual conditioning, as referring to humans in general.

Most Atlantic languages have a human gender meeting this characterization. For example, in Ganja, all the nouns belonging to gender HA–BI denote humans, and the HA-form *h-ílà* of the interrogative determiner *-ílà* 'which?' can be used pronominally, not only with reference to gender HA–BI nouns suggested by the context ('which one (gender HA–BI)?'), but also without reference to a particular antecedent, i.e., as the equivalent of English 'who?'.

The human gender typically differs from the others by a particular morphological complexity.

4.2.2. Languages in which the identification of a human gender is problematic

The lack of a gender combining all the properties that characterize the human gender in the most typical Niger-Congo gender systems is relatively common in North Atlantic languages. In the languages in question, the characteristic properties of human genders are distributed across different genders, so that none of them can be selected as having an exclusive relationship to the feature [human].

For example, in Wolof, *nit* 'human being' belongs to gender K–Ñ, and the K and Ñ forms of adnominals used pronominally lend themselves to a non-contextual interpretation as encoding [human] without reference to any particular antecedent (11b). This is an important property of human genders. However, *nit* is the only noun belonging to gender K–Ñ, and human nouns are distributed across the other genders, without a particular concentration in any of them (11c). Moreover, personal pronouns and personal names control class M

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[12] A variant of this situation is that the human gender conflates two inflectional types, one of them consisting exclusively of human nouns.

agreement (11d-e), which is somewhat unexpected because of the relatively low proportion of human common nouns in gender M–Y.

(11)   Wolof

(14a)   *nit* (K–Ñ)   'human being'

(11b)   *k-an?*   'who?'
        k-enn   'someone'
        k-eneen   'another person'
        ñ-eneen   'other persons'

(11c)   *ndaw* (S–Y)   'girl'
        coro (L–Y)   'girlfriend'
        jigéen (J–Y)   'woman'
        far (W–Y)   'boyfriend'
        góor (G–Y)   'man'
        xale (B–Y)   'child'
        morom (M–Y)   'peer, companion'

(11d)   *yow   m-i   fa   dem*
        2SG   clM-REL   there   go
        'you who went there'

(11e)   *Faatu   m-an?*
        Farou   clM-which
        'which Fatou?'

4.3. Derivation and gender

4.3.1. *V>N derivation*

In Atlantic languages, the stem of deverbal nouns may simply coincides with the corresponding verb stem or be formed via addition of a derivational affix or other morphological operation, but in both cases, deverbal nouns must be assigned a gender and the corresponding ONMs.

Event nouns (including infinitives) must be distinguished from concrete deverbal nouns referring to participants in the event or to the circumstances of the event (agent, instrument, place, etc.). As a rule, deverbal nouns referring to a given type of participants or circumstances are straightforwardly assigned to the same gender, and consequently contribute to shaping the semantic profile of the genders in which they are found. For example, as a rule, agent nouns are found in the human gender.

Things are different for event nouns. They can often be found in several genders, and semantic explanations are not easy to bring to light: see Sagna (2008) on Banjal (Jóola), Cobbinah (2013) on Gubëeher (Ñun), and Watson (2015) on Kujireray (Jóola). For example, in Kujireray, most verbs have a verbal noun in class E, but verbal nouns can also be found in

other classes: *kofen* 'sleep' > *ka-kofen*, *li* 'build dam' > *ba-li*, *oto* 'dream' > *si-oto*, *rem* 'drink' > *ma-rem*, etc. Watson (2015: 295–318) analyzes the possible semantic correlates of this variation.

4.3.2.   N>N derivation

The Atlantic languages tend to mark semantic relationships between nominal lexemes by mere alternation in inflectional type and gender, rather than by the addition of derivational affixes, or by means of N+N compounds. In other words, it is very common that semantically and formally related nominal lexemes share a common stem, and differ only in their ONMs and gender assignment.

Many Atlantic gender systems include EVALUATIVE GENDERS, defined as genders including nouns that can be characterized as diminutives or augmentatives in relation to nouns of other genders having the same stem, as Jóola Fóoñi *a-ñʋl* pl. *kʋ-ñʋl* (A–BK) 'child' > *jɪ-ñʋl* pl. *mʋ-ñʋl* (J–M) 'baby', or Fula *laam-ɗo* pl. *laam-ɓe* (O–ƁE) 'chief' > *laam-ŋga* pl. *laam-ko* (ŊGA–KO) 'mighty chief'. However, not all Atlantic gender systems include genders meeting this definition (Ganja has no evaluative genders), and productive diminutive genders are more commonly found than productive augmentative genders. For example, Jóola Fooñi has a productive diminutive gender (J–M), but no productive augmentative gender.

The notion of evaluative gender does not imply that all the nouns belonging to an evaluative gender can be characterized as augmentatives or diminutives. Quite on the contrary, the function of evaluative gender is often fulfilled by genders including also nouns carrying no diminutive or augmentative connotation, for which this is the primary gender assignment. For example, Jóola Fooñi gender J–M fulfills the function of diminutive gender, but also includes non-diminutive nouns such as *j-ʋʋl* pl. *m-ʋʋl* 'fanpalm'.

Other semantic relationships commonly encoded via mere alternation in inflectional type and gender typically include tree vs. fruit, individual vs. collective, concrete vs. abstract, and person(s) vs. behavior (people vs. language, etc.).

For example, in Jóola Fóoñi, the stem *bak* is shared by the lexemes *bʋ-bak* pl. *ʋ-bak* 'baobab tree' and *fʋ-bak* pl. *kʋ-bak* 'baobab fruit'.

Example (12) illustrates the use of the same stems with distinct ONMs and agreement patterns for human nouns and nouns of abstract quality.

(12)   Ganja (Balant)

à-láantὲ (A)	'man'	*gì-láantὲ* (GI)	'masculinity'
à-nîn (A)	'woman'	*gì-nîn* (GI)	'femininity'
à-fúlá (A)	'young woman'	*gì-fúlá* (GI)	'maidenhood'

Less common types include alternations expressing 'type of individual' and generic reference.

An alternation expressing 'type of individual' is found in Ganja, where nouns referring to concrete entities whose ONM in the singular is not *b-* can take the meaning 'a particular kind of ...' by simply replacing their prefix by *b-* and changing their agreement properties accordingly. For example, *b-láantὲ* 'kind of man' (< *à-láantὲ*) or *b-gbáalὲ* 'kind of house' (< *gbáalὲ* 'house') are used in contexts in which English, for example, would use sentences like 'I don't like this kind of man', or 'This kind of house cannot be found here'.

An alternation expressing genericity in the sense of reference to kinds can be found in Fouta-Djalon Fula (but apparently not in other Fula varieties). The rule is that, for nouns of all genders, genericity can be expressed by the combination of a zero suffix and agreement pattern ON, otherwise characteristic of the singular form of human nouns (Caudill & Diallo 2000: 25).

4.4. Personal names

In the Niger-Congo gender systems, all personal names in a given language, regardless of sex or of any other feature, behave in the same way as agreement controllers. In the languages where a human gender can be identified unequivocally, the general rule is that the agreement pattern triggered by personal names is that triggered by the singular of common nouns belonging to the human gender.

4.5. Toponyms

In the languages for which I have the relevant information, toponyms, like personal names, trigger uniform agreement patterns, regardless of their etymology. However, most descriptions do not provide information about the agreement properties of toponyms, and the data I have at my disposal are not sufficient to put forward generalizations about the agreement patterns assigned to toponyms.

4.6. Gender resolution rules in noun phrase coordination

In the languages that have subject and object indexes expressing class distinctions, the choice of a particular class for subject or object indexes referring to coordinated NPs is determined by gender resolution rules. When the coordinands do not belong to the same gender, the general tendency is as follows:

– if both coordinands have human referents, regardless of their gender, the corresponding index is the plural index of the gender used non-contextually with reference to humans;
– if both coordinands have non-human referents, regardless of their gender, the corresponding index is the plural index of the gender used non-contextually with reference to things.

Example (13) shows that, in Jóola Fóoñi, a coordination of two non-human nouns of gender B–U is resumed by the subject index of class S, plural of the gender used non-contextually with reference to things.

(13)   Jóola Fooñi

    bʊ-manga-a-b   *dɪ*   *bu-lolonk-ɐ-b*   *sɪ-wɔ-wɔl.*
    SG-mango(B)-D-clB   and   SG-soursop(B)-D-clB   sI:clS-bear.fruit-RDPL
    'The mango and the soursop bore fruit.'

The rules/tendencies formulated above say nothing about gender resolution when a human NP and a non-human NP are coordinated, but the prevailing tendency is simply to avoid coordinating human NPs with non-human ones. When speakers are asked to give an equivalent of 'The hunter and his dog got lost in the bush', they generally suggest translations whose literal meaning is 'The hunter got lost in the bush with his dog'.

5. The domains of gender-number agreement

5.1. Gender-number agreement within the noun phrase

In some Niger-Congo languages, gender-number agreement operates in all noun-modifier constructions without exception. Gender-number agreement of noun modifiers with their head may involve the inflection of the modifier or the inflection of an obligatory linker (or both).

5.1.1. Agreeing noun modifiers and linkers

Among Atlantic languages, Basari illustrates the case of a language with pervasive gender-number agreement within NPs, due to the systematic use of linkers. In Basari, the article, the demonstratives, the adjectives, and some numerals are the only noun modifiers containing a prefixed class marker, but the modifiers that do not have class inflection are obligatorily introduced by a linker inflected for class, as illustrated in (14) for genitival modifiers.

(14)   Basari (Perrin 2015)

(14a)   *a-cíw*   *a-tɔ́m*   *a-nd*   *fabá*   *aŋ*
        SG-room(AƊ$_{III}$)   clAƊ$_{III}$-big   clAƊ$_{III}$-LK   my.father   clAƊ$_{III}$.D
        'the large room of my father'

(14b)   *ɓa-cíw*   *ɓa-tɔ́m*   *ɓa-nd*   *fabá*   *ɓaŋ*
        PL-room(ƁAƊ$_{III}$)   clƁAƊ$_{III}$-big   clƁAƊ$_{III}$-LK   my.father   clƁAƊ$_{III}$.D
        'the large rooms of my father'

5.1.2. Non-agreeing noun modifiers

In the languages in which not all noun modifiers agree with their head, the following types of noun modifiers are those that, cross-linguistically, most commonly express agreement:

–   the demonstratives,
–   the interrogative determiner ('which?'),
–   the numeral 'one',
–   the adjectives.

By contrast, lack of agreement is relatively common in the noun-relative clause construction, in the noun-genitival modifier construction, or with the quantifier 'all'. As regards numeral

modifiers, they may require an obligatory linker inflected for class, but class inflection of the numeral itself is always limited to a subset of the numerals that denote units.

Nalu and Jaad are extreme cases of reduction of the scope of gender-number agreement.

In Nalu, the only noun modifiers that agree with their head are the demonstratives and the interrogative determiner (Seidel 2024: 392).

In Jaad, the only noun modifiers that express gender agreement with their head are the four determiners *-n* (definite article), *-n-n* (demonstrative), *-n-ŋe* (proximal demonstrative) and *-iinɛ* (anaphoric). In Jaad, adjectives also agree with the noun they modify, but only in number, not in gender. The agreement prefixes of adjectives *u-* (singular) and *bə-* (plural) are identical to the human agreement prefixes of the four determiners that have maintained gender agreement, but with adjectives, they are used irrespective of the gender of the modified noun.

5.2. Gender-number agreement and pronouns

5.2.1. Pronominal uses of determiners

When determiners inflected for class have the ability to be used pronominally, as is normally the case in Atlantic languages, class inflection expresses agreement with the antecedent. In (15b), depending on the context, the understood antecedent may be any noun triggering class E agreement in the singular.

(15)   Jóola Fóoñi

(15a)   *e-rɐp-e-y   y-ɐɐmɐk-e-y   nɪ-maŋ-ɛ*
          SG-cutlass(E)-D-clE   clE-big-D-clE   sI:1SG-want-CPL
          'It is the big cutlass that I want.

(15b)   *y-ɐɐmɐk-e-y   nɪ-maŋ-ɛ*
          clE-big-D-clE   sI:1SG-want-CPL
          'It is the big one (E) that I want.'

However, in the pronominal use of adnominals inflected for class, there is also the possibility of a non-contextual reading of some classes (see §6.2).

5.2.2. Third person pronouns

As a rule, in addition to the pronominal use of determiners, the Atlantic languages also have a third person pronoun inflected for class, representing discursively salient referents that the speaker considers identifiable from the mere mention of the gender of a noun that could designate them. For example, in Ganja, the seven classes constituting the class paradigm of adnominals (illustrated in (2) and (3) above) also account for the inflection of the third person pronoun. Note that the class BI form (human plural) is the only one that cannot be decomposed into a class prefix and a stem *í*.

(16)   Inflection of the third person pronoun in Ganja (Balant)

      class HA   *h-í*
      class BI   *bá*
      class B   *b-í*
      class U   *w-í*
      class GI   *g-í*
      class F   *f-í*
      class G   *g-í*

However, third person pronouns devoid of class inflection are common among North Atlantic languages. For example, the third person pronoun of Wolof has only two forms, singular *moom* 'he, she, it' and plural *ñoom* 'they'. Originally, *moom* and *ñoom* were probably the class M and class Ñ forms of a 3rd person pronoun inflected for class, but synchronically, the third person pronoun of Wolof does not mark the gender of its antecedent.

5.3.   Gender-number agreement in subject and object indexation

In general, as illustrated in (17) and (18), Atlantic languages have subject and object indexes attached to verbs that express class distinctions in the third person.

(17)   Ganja (Balant)

    Ŋ̀-góbù.   sI:1SG-fall   'I fell down.'
    Bâ-góbù.   sI:1PL.EXCL-fall   'We (excl.) fell down.'
    Bân-góbù.   sI:1PL.INCL-fall   'We (incl.) fell down.'
    Ú-góbù.   sI:2SG-fall   'You (sing.) fell down.'
    Bà-góbù.   sI:2PL-fall   'You (pl.) fell down.'

    À-góbù.   sI:clHA-fall   'He/she(HA) fell down.'
    B-góbù.   sI:clB-fall   'It(B) fell down.'
    Gì-góbù.   sI:clGI-fall   'It(GI) fell down.'
    F-góbù.   sI:clF-fall   'It(F) fell down.'
    Ù-góbù.   sI:clU-fall   'It (U) or they(U) fell down.'
    Bì-góbù.   sI:clBI-fall   'They(BI) fell down.'
    G-góbù.   sI:clG-fall   'They(G) fell down.'

(18)   Ganja (Balant)

    Bì-bíɩθâ-nì.   sI:clBI-see-oI:1SG   'They saw me.'
    Bì-bíɩθâ-báa.   sI:clBI-see-oI:1PL.EXCL 'They saw us (excl.).'
    Bì-bíɩθâ-bân.   sI:clBI-see-oI:1PL.INCL 'They saw us (incl.).'
    Bì-bíɩθá-nà.   sI:clBI-see-oI:2SG   'They saw you (sing.).'
    Bì-bíɩθâ-băa.   sI:clBI-see-oI:2PL   'They saw you (pl.).'

    Bì-bíɩθá-mà.   sI:clBI-see-oI:clHA   'They saw him/her(HA).'

Bì-bíıθâ-bí.	sI:clBI-see-oI:clB	'They saw it(B).'
Bì-bíıθâ-gí.	sI:clBI-see-oI:clGI/G	'They saw it(GI).' or 'They saw them(G).'
Bì-bíıθâ-fí.	sI:clBI-see-oI:clF	'They saw it(F).'
Bì-bíıθâ-wí.	sI:clBI-see-oI:clU	'They saw it/them(U).'
Bì-bíıθâ-bá.	sI:clBI-see-oI:clBI	'They saw them(BI).'

In Ganja, as illustrated in (19), neither subject nor object indexes are obligatory components of verb forms, and the arguments expressed as NPs or free pronouns are not indexed on the verb. Subject indexes are obligatory, however, in the absence of a subject NP or free pronoun referring to the same participant.

(19)   Ganja (Balant)

(19a)   *F-lìmbírè   mà   góbù.*
        SG-orange(F)   D   fall.CPL
        'The orange fell down.'

(19b)   *F-góbù.*
        sI:clF-fall.CPL
        'It(F) fell down.'

(19c)   *Ñ-jêd   f-lìmbírè   mà.*
        sI:1SG-take   SG-orange(F)   D
        'I took the orange.'

(19d)   *Ñ-jêd-fí.*
        sI:1SG-take-oI:clF
        'I took it (the orange).'

(19e)   *Mbágì-f-jêd!*
        PROH-oI:clF-take
        'Don't take it (the orange)!'

In other languages, subject indexes are obligatory even in the presence of a subject NP, as in (20), but I am aware of no Atlantic language having obligatory indexation of third person objects, either in general or in some conditions.

(20)   Mankanya (Gaved 2020: 52)

(20a)   *ba-ţiini*
        sI:clBAK-speak
        'They speak.'

(20b)   *ba-ntohi   ba-ţiini.*
        PL-elder(BAK)   sI:clBAK-speak
        'The elders speak.'

However, paradigms of subject and object indexes expressing class distinctions are not found in all the languages that have gender-number agreement within the NP. Wolof, already mentioned as having third person pronouns that are not inflected for class, also has subject and object indexes expressing only person and number. For example, a third person singular form such as *daanu na* 'he/she/it fell down' is compatible with subjects triggering any of the agreement patterns available for singular noun forms, and the corresponding plural form *daanu nañu* 'they fell down' is compatible with subjects triggering any of the agreement patterns available for plural noun forms.

This situation is not found among Bak languages, but is common among North Atlantic languages – see Perrin (2015) on Basari, Renaudier (2015) on Seereer, Bao Diop (2015) on Guñaamolo, Cobbinah (2013) on Gubëeher, Goudiaby (2017) on Gújáahár, Bassène (2015) on Biafada, Voisin (2015) on Kobiana, Seidel (2024) on Nalu.

5.4. Other constructions involving gender-number agreement

The grammaticalization of words expressing gender-number agreement may extend the range of constructions involving gender-number agreement.

For example, Jóola languages have a non-verbal locational copula expressing gender-number agreement with the argument of the locative phrase in predicate function, and the form of this copula suggests that it has grammaticalized from a demonstrative.

Similarly, Balant Ganja has an enclitic identification marker, analyzable as resulting from the grammaticalization of the third person pronoun, used as a focalizer in verbal predication, and as a copula in nominal predication. In both cases, as illustrated in (21), it attaches to the right edge of an NP with which it agrees in gender and number.

(21)   Ganja (Balant)

(21a)   *B-tá   b-ɔ́mbɔ́   =b-í   bà-m-búujì.*
        SG-tree(B)   clB-DEM   =clB-FOC   sI:2PL-ICPL-fell
        'It is this tree that you are going to fell.'

(21b)   *B-tá   b-díŋmɛ̀   =b-í.*
        SG-tree(B)   clB-small   =clB-COP
        'It is a small tree.'

6. Non-contextual uses of classes and orphan classes

6.1. The contextual use of classes

By contextual use of classes, I mean the canonical situation where either a form inflected for class can be related to an overtly expressed controller, or the sentence including this form can only be interpreted with reference to a particular controller suggested by the context.

For example, (22a) has been extracted from a context including no potential controller of class F, but speakers do not hesitate in identifying the antecedent of the class marker *f-* as

'day', and the meaning would not change if *fʊ-nak* 'day' were introduced in the role of head, as in (22b). The possibility of dropping the controller is conditioned by the presence of *kajɔm* 'tomorrow' in the role of modifier, and also by the fact that temporal indications are expected in the description of a sequence of events.

(22)   Jóola Fóoñi

(22a)   *... f-atı   kajɔm,   dı   kʊ-laañ.*
           clF-GEN   tomorrow   SEQ   sI:clBK-return
         '... and the following day, they returned.'

(22b)   *... fʊ-nak   f-atı   kajɔm,   dı   kʊ-laañ.*
           SG-day(F)   clF-GEN   tomorrow   SEQ   sI:clBK-return
         same meaning as (a)

6.2.   The non-contextual use of classes

Forms inflected for class are not always analyzable as agreeing with a noun present in the context or suggested by the context. They may also have NON-CONTEXTUAL uses in which no controller is present, and THE CONTEXT PLAYS NO ROLE IN THEIR INTERPRETATION.

For example, Jóola Fooñi has a relativizer CL-*an* expressing agreement with the head noun in the construction 'head noun + relativizer + relative clause'. However, 11 out of the 15 forms of the relativizer can also be found with free relatives for which the context plays no role in the identification of the notion modified by the property expressed by the relative clause. In the non-contextual use of the relativizer, free relatives are interpreted as indicated in (23).

(23)   Jóola Fóoñ: Non-contextual uses of the relativizer

    Ø-an   (clA)   'the person that...'
    k-an   (clBK)   'the people that...'
    y-an   (clE)   'the thing that...
    s-an   (clS)   'the things that...'
    b-an   (clB)   'where...'
    w-an   (clU)   'the thing that...'
    m-an   (clM)   'how...'
    t-an   (clT)   'where...'
    d-an   (clD)   'the thing that...'
    d-ɐn   (clD´)   'where...'
    n-an   (clN)   'when...'

The 11 classes listed in (23) have the same non-contextual uses with a variety of adnominals and pronouns. See Creissels & al. (2021) for a detailed analysis of the non-contextual uses of classes in Jóola Fóoñi.

In Atlantic languages, it is common that some classes lend themselves to non-contextual uses in which, regardless of the context, a word inflected for class is interpreted as referring to notions such as 'person', 'thing', 'place', 'manner', or 'time'.

For example, in Wolof, the class L forms of adnominals used pronominally can encode vague reference to inanimate entities without any contextual conditioning. In their contextual use, *l-ii* (class L form of the proximal demonstrative *-ii*) and *l-an* (class L form of the interrogative *-an*) are interpreted as, respectively, 'this one' and 'which one?' (in reference to a noun governing L agreement, such as *lin* 'pot'), but in (24), the context plays no role in the interpretation of *l-ii* as 'this (thing)', and of *l-an* as 'what?'.

(24) Wolof (elicited)

> *L-ii*   *l-an*   *la?*
> clL-DEM   clL-which   COP
> 'What is this?'

Historically, elision of a hypernymous noun in the role of controller is a plausible source of the non-contextual use of classes. However, synchronically, such an explanation only makes sense if the set of potential controllers of the class in question includes a noun whose lexical meaning coincides with the meaning expressed by the class in its non-contextual use, which is not always the case. For example, in Jóola Fóoñi, as indicated in (23), the class S form of the relativizer (*s-an*) can introduce free relatives interpreted as 'the things that...', although gender E–S includes no noun that could be glossed as 'thing'.

The impossibility of a synchronic treatment in terms of controller elision is particularly obvious for the 'orphan classes' evoked in §6.3, unless one accepts positing ghost controllers having no possible materialization in the lexicon.

6.3. Orphan classes

In Atlantic languages, the inflectional paradigm of the words commonly acting as agreement targets often includes cells that do not correspond to any potential controller, and consequently never mark agreement with a noun. Such classes, designated here as ORPHAN CLASSES, can only have non-contextual uses.

The class paradigm of Jóola Fóoñi adnominals and pronouns includes two orphan classes, D ('thing') and N ('time'). For example, in the other classes, the indefinite determiner *-cɛɛn* 'some' can modify a noun, as in *f-al fʊ-cɛɛn* 'some river', or be used pronominally with reference to an antecedent, as in *fʊ-cɛɛn* 'some X' (X a noun of gender F–K to be retrieved from the context). By contrast, *dɪ-cɛɛn* can only be used pronominally as the equivalent of English 'something', and *nɪ-cɛɛn* can only be used adverbially as the equivalent of English 'sometimes'.

Wolof has two orphan classes, F ('place') and N ('manner'). For example, in the classes other than F and N, the forms of the interrogative *-an* 'which?' can modify a noun, as in *fas w-an* 'which horse?', or act as pronouns referring to an antecedent, as for example *w-an* 'which X?' (X a noun of gender W–Y to be retrieved from the context). By contrast, *f-an* can only be used adverbially as the equivalent of English 'where?', and *n-an* can only be used adverbially as the equivalent of English 'how?'.

An orphan class with the meaning 'place' is found in Laalaa (Laalaa class D, cf. Dieye 2015: 315).

Seereer has an orphan class with the meaning 'time' (Y), and two orphan classes referring to 'place' (M and T) (Renaudier 2015).

Bassari has an orphan gender (sg. ƐN_I /pl. ƁƐN_I) with the meaning 'thing(s)' (Perrin 2015).

7.   Semantic agreement

In gender systems characterized by regular associations between genders and ONMs, semantic agreement (as opposed to morphological agreement) refers to situations where an agreement rule conditioned by semantic properties of the controller overrides the regular associations between ONMs and agreement.

7.1.   Animacy-governed semantic agreement

There is important cross-linguistic variation in the regulation of the competition between morphological agreement and semantic agreement. In some languages, semantic agreement is marginal, or even inexistent, whereas in other languages, such as Ganja and Noon, semantic agreement is systematic with human or animate nouns.

In Ganja, most common nouns referring to humans belong to inflectional type *à-* (sg.) / *bì-* (pl.) and to gender HA–BI. HA agreement is also triggered by personal names, and consequently, HA–BI can be identified as the human gender. A minority of common nouns referring to humans belong to inflectional types other than *à-* / *bì-*. However, as agreement controllers, the nouns in question invariably trigger HA agreement in the singular, and BI agreement in the plural.

(25)   Ganja (Balant)

(25d)   *Ø-Fàafá   à-mfáná   ᵗh-í.*
        SG-father(HA)   clHA-kind   clHA-ID
        'This is a kind father.'

(25e)   *Ŋ-mbùutá   bì-dìndímè   bá.*
        PL-child(BI)   clBI -stubborn   clBI.ID
        'These are stubborn children.'

In Ganja, whatever their ONMs, the singular form of nouns denoting non-human animates triggers the hybrid agreement pattern U/HA, whereas their plural form triggers the same agreement pattern BI as the plural of human nouns. As illustrated in (26), the general rule in the agreement pattern U/HA is that noun modifiers show U agreement, whereas other agreement targets show HA agreement.

(26)   Ganja (Balant)

(26a) *Ø-Mfõl*   *ù-lóodè*   *h-í.*
      SG-frog(U/HA)   clU-dead   clHA-ID
      'This is a dead frog.'

(26b) *À-hʊ́d*   *ù-dʊ̀ʊlʊ́*   *ˡh-í.*
      SG-guinea.fowl(U/HA)   clU-small   clHA-ID
      'This is a small guinea fowl.'

A general rule in the Niger-Congo systems that have animacy-driven semantic agreement is that diminutive human nouns maintain morphological agreement. This cannot be observed in Ganja, since the gender system of Ganja does not include evaluative genders, but Noon confirms this generalization (Wane 2017: 61).

      When the agreement behavior of a given noun shows variation between morphological and semantic agreement, the tendency towards selecting semantic agreement is stronger in argument indexation and in antecedent-pronoun agreement than in head-modifier agreement within NPs, and within NPs, the tendency towards maintaining morphological agreement is stronger for modifiers that regularly occur in contact with their head.

7.2. Genericity-governed semantic agreement

In Jóola languages and Bijogo, genericity in the sense of reference to kinds (as opposed to reference to individuals) conditions gender-number agreement of third person subject indexes.

      In Bijogo, class ŊO, which includes the noun *ŋoo* 'thing' among its potential controllers, is also the class used non-contextually to express vague reference to things; as illustrated in (27), the subject index of class ŊO can also resume nouns that normally do not trigger ŊO agreement, but then the subject NP must be understood as generic.

(27) Bijogo (Segerer 2002)

(27a) *Kɔ-kpɛñ*   *kɔ-tɔnɔŋ.*
      SG-silk.cotton.tree(KO)   sI:clKO.CPL-be.tall
      'The silk cotton tree (specific) is tall.'

(27b) *Kɔ-kpɛñ*   *ŋɔ-tɔnɔŋ.*
      SG-silk.cotton.tree(<u>KO</u>)   sI:clŊO.CPL-be.tall
      'Silk cotton trees (generic) are tall.'

In Jóola languages, when non-human singular nouns are used in subject function with specific reference, they can only trigger morphological agreement. When they carry generic reference, it is still possible to have morphological agreement (in which case there is no overt indication that the subject must be understood as generic), but it is also possible to use the human singular index, and then the subject can only been understood as generic (Bassène 2015a), as in (28).

(28)   Jóola Fóoñi

      Y-ɛntaam-ɛ-y   na-rɔŋɛn-ɛ-ɪ-rɔŋɛn.
      SG-land(<u>E</u>)-E-clE   sI:clA-care.for-ICPL-PASS-RDPL
      'Land must be cared for.'

8.   Radical changes in Atlantic gender-number agreement systems

Multiple-gender systems closely related to the division of nouns into inflectional types are certainly very ancient in the Atlantic family and are still found in most present-day Atlantic languages. However, the Atlantic family also includes languages whose gender system has undergone radical changes leading to important modifications of its typological profile, or even to its total loss.

8.1.   Loss of ONMs related to gender

Wolof illustrates the almost total loss of ONMs. In Wolof, with very few exceptions, the minimal form of nouns cannot be segmented in a synchronic analysis, and NPs can only be identified as singular or plural if they include modifiers expressing gender-number agreement. For example, *fas* ('horse'), unspecified for number, is compatible with two agreement patterns, W and Y; class W forms of modifiers trigger a singular reading, whereas class Y forms trigger a plural reading.

(29)   Wolof

(29a) *Gis   naa   fas.*
       see   PRF.sI:1SG   horse(W/Y)
       'I saw a horse.' or 'I saw horses.'

(29b) *Gis   naa   fas   w-u   ñuul.*
       see   PRF.sI:1SG   horse(W/Y)   clW-REL   be.black
       'I saw a black horse.'

(29c) *Gis   naa   fas   y-u   ñuul.*
       see   PRF.sI:1SG   horse(W/Y)   clY-REL   be.black
       'I saw black horses.'

Seereer can be analyzed as illustrating an intermediate stage in the evolution that led to the almost complete loss of ONMs in Wolof. Seereer still has a system of ONMs prefixed to noun stems, but, as illustrated in (30) by the agreement of the adjective 'good' and the definite article, the number of possible ONMs (5) is considerably smaller than the number of distinct agreement patterns (13), and the phonologically null ONM may correspond to five distinct agreement patterns.

(30)   Seereer (Faye 1979: 119)

Ø-fambe	*Ø-faax*	*l-e*	'the good goat'
Ø-pis	*Ø-mbaax*	*n-e*	'the good horse'
Ø-japil	*fa-mbaax*	*f-e*	'the good knife'
Ø-wiin	*Ø-faax*	*w-e*	'the kind men'
Ø-pis	*Ø-paax*	*k-e*	'the good horses'
o-koor	*o-paax*	*ox-e*	'the kind man'
o-hiic	*o-faax*	*ol-e*	'the good jujube'
o-ɓiy	*o-mbaax*	*onq-e*	'the kind child'
fo-sis	*fo-faax*	*ol-e*	'the good milk'
fo-njooɓ	*fo-mbaax*	*n-e*	'the good little tamarind tree'
a-cek	*a-paax*	*al-e*	'the good hen'
a-cek	*a-paax*	*ak-e*	'the good hens'
xa-kiic	*xa-paax*	*ax-e*	'the good jujube'

8.2. Reduction of the gender system to an animate vs. inanimate (or human vs. non-human) distinction

Some Niger-Congo languages have generalized semantic agreement to the point where the only agreement patterns that subsist are those that initially characterized a gender used non-contextually with reference to persons, and a gender used non-contextually with reference to things, resulting in binary gender systems (animate vs. inanimate or human vs. non-human) semantically transparent and devoid of any relationship to noun morphology. Such a situation is found among others in Kinshasa Lingala (Bantu; Meeuwis 2010), Igo (Kwa; Gblem 1995), and Kulango (Gur; Kra 2016).

Among Atlantic languages, a semantically transparent gender system resulting from the generalization of animacy-governed semantic agreement is found in Saafi. According to Mbodj (1983: 176-181), Saafi has a tripartite gender distinction human / non-human animate / inanimate. For example, the demonstrative pronoun is *yii* (sg.) / *ɓii* (pl.) in the human gender, *yii* (sg.) / *cii* (pl.) in the non-human animate gender, and *wii* (sg.) / *cii* (pl.) in the inanimate gender.

Nalu as described by Seidel (2024) is close to this situation, with three genders that can be characterized as animate, inanimate and locative. Moreover, Nalu is atypical in that, cross-linguistically, the neutralization of gender distinctions occur typically in the plural, whereas in Nalu, distinct agreement patterns for animate and inanimate nouns are only found in the plural, not in the singular.

8.3. Emergence of number marking dissociated from the gender system

The phenomenon described in this section can be observed in Ñun-Buy languages (Voisin 2015a) and Biafada (Bassène 2015b); it has been completely systematized in Jaad (Ducos 1971, Meyer 2001). Readers are referred to Cobbinah (2017) for a detailed discussion of suffixal number marking dissociated from the gender system in Ñun languages.

Historically, a plausible source of the plural markers dissociated from the gender system found in Ñun-Buy and Jaad-Biafada is the reanalysis of associative plural markers (i.e., markers that typically combine with personal names to express 'X and associates') as

ordinary additive plural markers. The dedicated plural suffix of Ñun languages is a plausible reflex of a Proto-Atlantic associative plural marker whose reconstruction is discussed by Pozdniakov (2015), and whose most obvious reflex is the Fula associative plural marker *-en*. As regards the dedicated plural prefix found in Jaad and Biafada, its probable origin is a human plural pronoun that first grammaticalized as an associative plural marker in a construction whose original meaning may have been 'the people of X' (much in the same way as Wolof *ñoom* 'they', also used as an associative plural marker, as in *ñoom Sàmba* 'Samba and associates').

8.3.1. Plural marking in Ñun-Buy languages

In Ñun-Buy languages, most nouns express the singular vs. plural distinction via prefix alternation, but there is also a significant minority of nouns whose plural is formed by the addition of a dedicated plural marker disconnected from the gender system. As a rule, the modifiers of such nouns show the same agreement marks in the singular and in the plural, but in the plural, they take an additional mark of plural agreement. With such nouns, the former singular prefix can still be analyzed as an ONM related to the gender system, but it has lost its function of number marker.

For example, in Guñaamolo, (31a-b) illustrates plural formation and agreement for a noun following the traditional pattern, whereas (31c-d) illustrates the case of a noun whose plural is formed by the addition of the plural suffix.

(31)   Guñaamolo (Bao Diop 2015)

(31a)   *gʊ-sɔl-ɔ*   *gu-duk-o*
        SG-dress(GU)-D   clGU-other-D
        'the other dress'

(31b)   *ha-sɔl-ɔ*   *hɐ-duk-o*
        SG-dress(HA)-D   clHA-other-D
        'the other dresses'

(31c)   *ka-taama*   *kɐ-denn*
        NN-river(KA)   clKA-big
        'big river'

(31d)   *ka-taama-aŋ*   *kɐ-denn-eŋ*
        NN-river(KA)-PL   clKA-big-PL
        'big rivers'

Example (32) shows that a given prefix may still act as a singular prefix contrasting with a plural prefix with some nouns (32a-b), whereas with others it has lost its function of number marker (32c-d), the plural being marked by the suffixation of the dedicated plural marker.

(32)   Guñaamolo (Bao Diop 2015)

(32a)   *fa-tɔnɔ   fɐ-denn*
        SG-bird(FA)   clFA-big
        'big bird'

(32b)   *ja-tɔnɔ   jɐ-denn*
        PL-bird(JA)   clJA-big
        'big birds'

(32c)   *fɐ-kkir   fɐ-denn*
        NN-monkey(FA)   clFA-big
        'big monkey'

(32d)   *fɐ-kkir-eŋ   fɐ-denn-eŋ*
        NN-monkey(FA)-PL   clFA-big-PL
        'big monkeys'

Ñun languages also have nouns with doubly marked plurals, differing from the corresponding singulars both by prefix alternation and the addition of the dedicated plural marker.

(33)   Guñaamolo (Bao Diop 2015)

(33a)   *bi-giir   bi-denn*
        SG-face(BI)   clBI-big
        'big face'

(33b)   *ɐ-giir-eŋ   ɐ-denn-eŋ*
        PL-face(A)-PL   clA-big-PL
        'big faces'

8.3.2.   Plural marking in Biafada

In Biafada, as in Ñun-Buy languages, most nouns maintain the relationship between plural marking and agreement typically found in Niger-Congo gender systems.

(34)   Biafada (Bassène 2015)

(34a)   *bú-réegə   bə́-rəbbá   bu-gu*
        SG-canoe(BƏ)   clBƏ-big   clBƏ-DEM
        'this big canoe'

(34b)   *sáa-réegə   sáa-rəbbá   saa-gə*
        PL-canoe(SAA)   clSAA-big   clSAA-DEM
        'these big canoes'

However, Biafada also has nouns whose plural is formed by the addition of a dedicated plural prefix *ba-* disconnected from the gender system. Such plural forms trigger gender agreement with the same marks as in the singular, and plural agreement marked by an additional prefix identical to the plural prefix of nouns.

(35)   Biafada (Bassène 2015)

(35a)   *sá-də   sá-təbbá   sa-ggə*
         NN-house(SA)   clSA-big   clSA-DEM
         'this big house'

(35b)   *ba-sá-də   ba-sá-təbbá   ba-sa-ggə*
         PL-NN-house(SA)   PL-clSA-big   PL-clSA-DEM
         'these big houses'

As in Ñun-Buy languages, a given prefix may be involved in number marking with some nouns (37a-b), whereas with other nouns it is maintained in the plural, and the plural is marked by the addition of *ba-* (37c-d).

(37)   Biafada (Bassène 2015)

(37a)   *ni-ndá   nə-ntəbbá   nu-ŋ*
         SG-child(NƏ)   clNƏ-big   clNƏ-DEM
         'this big child'

(37b)   *ma-ndá   ma-ntəbbá   ma-ŋ*
         PL-child(MA)   clMA-big   clMA-DEM
         'these big children'

(37c)   *ni-mpúulɐ   nə́-ntəbbá   nu-ŋ*
         NN-girl(NƏ)   clNƏ-big   clNƏ-DEM
         'this big girl'

(37d)   *ba-ni-mpúulɐ   ba-nə́-ntəbbá   ba-nu-ŋ*
         PL-NN-girl(NƏ)   PL-clNƏ-big   PL-clNƏ-DEM
         'these big girls'

8.3.3. Plural marking in Jaad

As regards plural marking, Jaad (the closest relative of Biafada) has maintained the expression of number via prefix alternation for the nouns that belong to the human gender U–BE, for example *u-saada* pl. *bə-saada* 'hunter'), whereas in all the other genders, with very few exceptions, plural marking via prefix alternation has been lost, and the plural is formed by the addition of the plural prefix *be-* (cognate with Biafada *ba-*) to the singular form of the noun: *kunaa* pl. *be-kunaa* 'cow', *mat* pl. *be-mat* 'tree', etc.

The initial of most Jaad nouns is still clearly recognizable as cognate with a Biafada prefix, it is often analyzable as a prefix having a derivational function, as in *bərəmbɛ* 'rhun palm' / *mantəmbɛ* 'rhun palm wine', and it has a clear relationship with the agreement of the determiners that have maintained gender agreement. However, as a rule, the initial of the nouns that do not belong to the human gender U–BE does not change in the plural (for example, the plural of *bərəmbɛ* 'rhun-palm is *be-bərəmbɛ*). A few nouns belonging to genders other than U–BE have maintained the former plural marking, but they also take *be-* in the plural, resulting in double-marked plurals, as for example *wa-ndaafɛ* pl. *be-ma-daafɛ* 'goat'.

8.4. The collapse of the gender system in Cangin languages

Among the Northern Atlantic and Bak languages for which the relevant information is available, the total collapse of the gender system is only attested in two of the five Cangin languages (Palor and Ndut) and in Pukur. In this section, Palor and Ndut are compared to the other Cangin languages, in which the evolution of the gender system does not affect its very existence.

Before examining the differences between Cangin languages, it is important to observe that they share the grammaticalization of a set of determiners that have lost the ability to occur elsewhere than immediately after a noun. Synchronically, the determiners in question can be analyzed as complex suffixes consisting of two formatives, a first formative which is historically the reflex of the agreement prefix of the determiner, and a second formative that can be designated as DETERMINATION MARKER. The fact that several descriptions explicitly mention that they undergo vowel harmony governed by the noun stem constitutes a decisive proof of their suffixal nature.

Among Cangin languages, Laalaa as described by Dieye (2015) is the one in which the relationship between noun inflection and gender is best-preserved. Laalaa has a full-fledged system of gender agreement, in which no semantic agreement rule interferes with the division of nouns into semantically arbitrary genders. For example, (38) illustrates the class inflection of the determiner *-ɪɪlɪs* 'other'.

(38) Class inflection of *-ɪɪlɪs* 'other' in Laalaa

singular classes	Y	*y-ɪɪlɪs*
	W	*w-ɪɪlɪs*
	F	*f-ɪɪlɪs*
	M	*m-ɪɪlɪs*
	K	*k-ɪɪlɪs*
	P	*p-ɪɪlɪs*
	T	*j-ɪɪlɪs*
plural classes	Ɓ	*ɓ-ɪɪlɪs*
	C	*c-ɪɪlɪs*
	T	*t-ɪɪlɪs*

As regards noun morphology, in five of the eight genders, the former ONMs have disappeared or fused with the stem, and nouns have a single form for singular and plural, whereas the nouns belonging to the remaining three genders maintain distinct singular and plural forms

with ONMs prefixed to the stem. When determinative suffixes are added, as for example *-aa* 'definite, distal' in (39), the formative inserted between the stem and the determinative suffix is identical to the corresponding class prefix in the inflection of agreeing adnominals such as *-ɩɩlɩs* 'other', with the exception of classes Y and Ɓ.

(39)   Genders and noun morphology in Laalaa

gender	singular	plural	
Y–Ɓ	*ɓɛʔ(-Ø-aa)*	*ɓoʔ(-Ø-aa)*	'human being'
Y–C	*ɔñ(-Ø-aa)*	*ɔñ(-c-aa)*	'thing'
W–C	*yɔɔn(-Ø-aa)*	*yɔɔn(-c-aa)*	'field'
F–C	*caasɛ(-f-aa)*	*caasɛ(-c-aa)*	'porcupine'
M–C	*mɔɔn(-m-aa)*	*mɔɔn(-c-aa)*	'tear'
K–T	*k-ʋas(-k-aa)*	*t-ʋas(-t-aa)*	'eye'
P–T	*p-isil(-p-aa)*	*t-isil(-t-aa)*	'vein'
J–T	*j-ɔkɔn(-j-aa)*	*t-ɔkɔn(-t-aa)*	'finger'

Noon as described by Wane (2017) shows the same situation as regards noun inflection, However, the situation is different as regards agreement. In Noon, agreement according to a semantically arbitrary division of nouns into genders is maintained with inanimate nouns and diminutives, but with non-diminutive animate nouns, the only possible forms of adnominals and pronouns are a singular form and a plural form corresponding to the gender Y–Ɓ of Laalaa.

In Saafi, the expression of number by means of prefix alternation has completely disappeared, and the morphological expression of number is limited to the formative inserted between noun stems and determinative suffixes. With eight possible singular forms and two possible plural forms, this formative maintains the former division of nouns into semantically arbitrary genders, as illustrated in (40) by the suffixation of the determinative suffix *-i* 'definite, proximal'.

(40)   The definite marker *-i* in Saafi (Pouye 2015)

ɓɔʔ(-y-i)	'(the) human being'
yaah(-Ø-i)	'(the) hand'
mboh(-k-i)	'(the) neck'
taango(-n-i)	'(the) mountain'
ɓuh(-f-i)	'(the) dog'
saaf(-nd-i)	'(the) Saafi speaker'
miɗa(-m-i)	'(the) salt'
hoso(-r-i)	'(the) voice'
ɓɔʔ(-ɓ-i)	'(the) human beings'
pambi(-c-i)	'(the) hens'

However, in Saafi, contrary to Laalaa and Noon, this paradigm is completely disconnected from the agreement system. In Saafi, as already mentioned above, agreement has been

completely reorganized according to the two semantic distinctions human vs. non-human animate vs. inanimate and singular vs. plural.

In other words, in Saafi, the former system of ONMs prefixed to noun stems has completely disappeared, and all that remains of the former class inflection of adnominals and pronouns is, on the one hand, a division of nouns into inflectional types according to the form taken by the number marker inserted between the noun stem and the determinative suffixes, and on the other hand, a reduced set of gender-number agreement marks in a semanticallly transparent gender system completely disconnected from noun inflection.

Finally, as analyzed by Diagne (2015), Palor and Ndut are very similar to Saafi as regards noun inflection (with, however, a lesser variety of number markers inserted between noun stems and determinative suffixes), but have undergone a more radical change as regards gender, since adnominals and pronouns have only maintained a singular form and a plural form. In fact, synchronically, Ndut and Palor have no gender system at all.

9. Conclusion

The main conclusion that emerges from this survey of North Atlantic and Bak systems of noun inflection and gender is that, at least in this particular domain, the typological diversity is greater among North Atlantic languages than among Bak languages. As a rule, the gender systems of Bak languages stand closer to the Niger-Congo prototype than do those of North Atlantic languages. Several types of deviation from the Niger-Congo prototype that are relatively common among North Atlantic languages are not attested among those Bak languages for which sufficient documentation is available:

- Argument indexation mechanisms that do not reflect gender distinctions are very common among North Atlantic languages, whereas all Bak languages have argument indexation systems expressing gender distinctions.
- Systems in which the nouns belonging to some genders, or even the nouns in general, do not show ONMs related to the gender system, can only be found in Wolof and Cangin.
- Languages in which number marking and number agreement may be dissociated from the gender system can only be found in Biafada, Jaad, Buy, and Ñun.
- Gender systems in which the distinction between human and non-human genders is more or less blurred are found exclusively among North Atlantic languages.
- Systems showing a radical reorganization of the gender system, or disappearence of gender altogether, are only found among North Atlantic languages.

The following feature reinforces the typological contrast between North Atlantic and Bak:

- Systems in which consonant alternations play a crucial role in the expression of ONMs and as an exponent of class distinctions are found exclusively in the North Atlantic branch.

In a broader typological perspective, among the phenomena examined in this chapter, the coding of generic reference by treating nouns with generic reference as singularia tantum of

the human gender (as in the Fouta Djalon variety of Fula), or by using human singular indexes with subject nouns belonging to other genders (as in Joola), is of particular interest in the sense that nothing similar seems to have been discussed in the typological literature on noun classes and gender.

Abbreviations

Capital letters between parentheses immediately after the lexical gloss of a noun form indicate the agreement pattern triggered by the form in question. The other abbreviations are as follows: clX: class X, COP: copula, CPL: completive, D = definite, DEM: demonstrative, DIST: distal, DJ: disjoint, EXCL: exclusive, FOC: focalizer, GEN = genitive, ICPL = incompletive, INCL: inclusive, LK: linker, LOC: locative, NN = number neutral, oI: object index, PASS: passive, PL: plural, PRF: perfect, PROH: prohibitive, RDPL: reduplicative affix, REL: relativizer, SEQ = sequential, SG: singular, sI: subject index.

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