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Analogical changes in Niger-Congo pronominal systems

Various paradigms of personal markers in Niger-Congo systems show systemic diachronic changes by analogy. Due to these changes, various pronominal oppositions are neutralized. Apart from these classical neutralizations, we observe many less "aggressive" analogical changes where two forms of a paradigm stay different, but they obtain a common formal segment – some common consonant, or a common vowel, a tone, a phonetic structure. Let us compare 2 paradigms of Wolof:

Possessive	SG.	PL.	*Disjunctive*	SG.	PL.
1	suma	suñu		man	ñun
2	sa	**seen**		yow	yeen
3	-am	**seen**		**moom**	**ñoom**

In the Possessive paradigm, we deal with a neutralization 2PL. = 3PL., due to the analogical change ***suñu > seen*** (3PL., "vertical" complete unification of forms: **seen = seen**). In the Disjunctive one, we have an analogical change ***ñu > ñoom*** (3PL. ≈ 3SG., "horizontal" partial unification of forms with a common marker *-oom* for 3rd person: **moom ≈ ñoom**). This banal example does pose many questions unexplored in theory: why is it that the 3PL. form which shows a diachronic change by analogy and not the 2PL. or the 3SG. form? Why do we have a complete "vertical" unification and a partial "horizontal" one and why do we not observe the opposite scenario? Why (or for which purposes?!) do different languages need such unifications? What is their synchronic function(s)?

In linguistic theory we have nothing to read on these topics. Why? The ascertaining remark that "***suñu** (3PL.) > seen* (3PL.) by analogy with 2PL." must completely pacify a specialist on Atlantic comparative linguistics. This information is more than sufficient for reconstruction purposes. As for a specialist on the synchronic description of the Wolof, he might describe the *seen* neutralization in his Wolof grammar, but he will not even notice the marker *–oom* in the disjunctive paradigm and it is for a simple reason – *-oom* is not a morpheme. So the problem described above is not interesting either for specialists on comparative linguistics or for specialists on the synchronic state of a language.

My topic looks at these features of Niger-Congo pronominal paradigms which still do not interest anybody. The African pronouns database [Segerer 2010] gives reliable and rich evidence for typological and genetic studies of Niger-Congo personal markers and in particular of (a) Niger-Congo diachronic changes, and (b) synchronic structuring of pronominal paradigms. Most paradigms cited below are taken from this database, where one could find exact references.

Here are two typical examples of complete and partial unifications:

Niellim (Adamawa)			Linda (Ubangi)		
S	SG.	PL.	**O**	SG.	PL.
1	ǹ	í (excl.), ì (incl.)	1	mə̄	ʔā (excl.), ʔà (incl.)
2	m̀	í	2	bə̀	ʔē̄
3	ŕ, ȑ	á	3	cè (a), tə́-nə̀ (z), nə̀ (z) ə̀nē (L),-nē (L)	ə̀njē̄ àlànē̄ (L)

In Niellim, 1PL.exclusive and 2PL. have an identical marker, a high-tone *i,* which means a neutralization of the opposition of plural pronouns according to the feature "locutor/interlocutor". 1PL.exclusive and 1PL.inclusive forms are not identical, as they are distinguished by tone, however, their segmental component is the same, it is the vowel *i*. Therefore, we have here a case of "partial unification". It can be mentioned, that singular locutor pronouns have one feature in common, a nasal sonant; they can also be considered as "partially unified".

In Linda, we find almost the same strategy of formal linking. As in Niellim, 1PL.EXCL., 1PL.INCL. and 2PL. have an identical marker (**ʔ-**) with two additional binary features: the vowel **-a** in 1PL.EXCL. and 1PL.INCL.; the mid tone in 1PL.EXCL. and 2PL. As in Niellim, singular locutor pronouns also have one feature in common – a labial consonant. We can also observe a partial unification in 3PL. ≈ 3SG.: a dental or a palatal consonant.

Full unification is typical not only with markers within one paradigm; it may also happen with adjacent markers belonging to different paradigms. Here are two more pronominal paradigms (Subject and Object pronouns) in Wolof:

Sujet	SG.	PL.	*Objet*	SG.	PL.
1	**ma**	**ñu**		**ma**	**ñu**
2	nga / ya	ngeen		la	**leen**
3	mu	**ñu**		ko	**leen**

In both paradigms, 1st person pronouns are identical (both in singular and in plural: *ma* and *ñu* respectively), whereas the 2nd and 3rd person pronouns are represented by non-identical forms.

Let us consider these examples to formulate once more certain empirical observations and theoretical postulates which were discussed in my previous publications [Pozdniakov 2003 ; 2004; 2009], [Pozdniakov–Segerer 2004].

A total unification (or neutralization) occurs less frequently than a partial unification for it is a more aggressive strategy leading to a loss of the distinctness of the unified morphemes. A partial unification represents a less radical and a more flexible technique, allowing a formal similarity of two different signs to display without great losses.

Both full and partial unifications have the same functions; therefore there is nothing that prevents us to consider them in the same range. They have at least two functions:

1) Presence of a common formal feature facilitates their integration into one paradigm thus serving as a kind of tie. So, in Niellim, the technique of full unification of morphemes ties 1PL.EXCL. and 2PL., and the technique of partial unification ties 1PL.EXCL. and 1PL.INCL. (and also 1SG. and 2SG.). In Wolof, a "classical" neutralization integrates into one system two different paradigms, subjective and objective, tying them formally by identical 1SG. and 1PL. forms. At the same time, it integrates markers of all three persons within the common pronominal system: subjective pronouns 1PL. = 3PL., objective pronouns 2PL. = 3PL. Therefore, we have in plural: 1PL. = 2PL. = 3PL. Let us mention, that in Wolof plural pronouns we find a typical case of distribution of such "ties" among different paradigms: in one paradigm (S) 1PL. = 3PL., in the other (O) 2PL. = 3PL. Certainly, a distribution of binary neutralizations among paradigms is a less aggressive strategy than a full neutralization of plural pronouns within one paradigm (1PL. = 2PL. = 3PL.). This observation leads us to a metaphor of "neutralization cascade" in different paradigms as a flexible strategy allowing a maximal integration of the units into a common system where a loss of distinctive power is minimal. In this regard, a complementary distribution of formal unification among the paradigms proves to be the most economical and elegant technique readily used by many languages.

2) A common feature is a prerequisite for the emergence of **a new category** in a language. So, when Niellim 1PL.EXCL. and 2PL. pronouns are unified, the language creates a category of "locutor" thus contrasting 1st and 2nd person with the 3rd person. By introducing a common form for the 1st and 3rd person, the Wolof language singles out a new category, "interlocutor (2) vs. non-interlocutor". By using identical markers in 1SG and 1PL in subjective and objective paradigms, Wolof opposes these syntactic functions with the disjunctive function where the 1st person pronouns are represented by non-identical forms: 1SG. *man* ≠ 1PL. *ñun*.

In Niger-Congo languages, just like everywhere, such unifications (full or partial) often result from analogical changes. The mechanism of such a change is as follows: one of the paradigm members undergoes an irregular individual modification thus acquiring phonemic characteristics shared by another member of the paradigm.

Here are 3 Cangin (North Atlantic) examples:

Noon		
S	SG.	PL.
1	mi	6O
2	fo	ɗu
3	ya, yo	6a

Safen		
S	SG.	PL.
1	ŋ	6o
2	fu	ɗu
3	ɗa	6a

Lehar		
S	SG.	PL.
1	mɛ	6y
2	fu	**6u**
3	ye	6a

In Lehar, 2PL *ɗu* > **6u**, this irregular modification resulted in the appearance of a common feature (**6-**) for the plural markers. Independently of Lehar, a voiced labial occlusive has become a common feature of plural pronouns in another Atlantic language, namely, Balant (Bak < North-Atlantic):

Manjak-Churo (Bak)		
S	SG.	PL. (**-á**)
1	mã	dj**á**
2	n'	d**á**
3	a	b**á**

Balant (Bak)		
O	SG.	PL. (**ba-**)
1	ɲi	**b**a
2	na	**b**aa
3	ma	**b**aan

Joola Kwaatay (Bak)		
O	SG.	PL. (**-n**)
1	-am	-uni-
2	-ii	-uu**n**
3	-oo	-ii**n**

The case of the Bak group is quite representative. In the three languages in question, one can easily perceive a tuning of plural pronouns, however, the tuning implies different markers in each language. In Joola Kwaatay it is the consonant *n,* in Balant it is initial consonant *b-*, in Manjak-Churo it is final vowel with the same accent (*-á*). It is evident that the three markers cannot be regarded as regular reflexes of the Proto-Bak form; the tuning of the members of the paradigm took place independently in each language.

Irregular modifications of this kind are so frequent that we can affirm, without hesitation, that there is not a single branch in Niger-Congo where a reconstruction of pronouns could be possible without identifying changes by analogy. And even in the available reconstructions of pronominal systems their members are mutually tuned with respect to their form.

According to the reconstruction by [Meeussen 1967], the Proto-Bantu infix forms are as follows:

	SG.	PL.
1	-n-	-tú-
2	-ku-	-mú-
3	-mu-	-bá- (2)-, -gú- (4), -gí- (4), *etc.*

In this case, there is an evident prosodic tuning of plural pronouns: all of them, including the numerous markers of noun classes in 3PL., are characterized by a high tone, which distinguishes them from singular forms. It is interesting that this type of unification has been maintained in the Manjak Churo (Bak < North Atlantic).

There is a noteworthy remark by Meeussen "In part of the domain (N.-E.), a variant ***-bá-*** for 2nd. pers. PL. is attested as a homophone of ***-bá-*** 'them' " [Meeussen 1967, 110]. The dialectal form mentioned by Meeussen has certainly appeared as a result of a change by analogy.

It should be highlighted once more that similar unification of markers may emerge independently from the change by analogy in different spots of the Niger-Congo world. Let us compare two pronominal paradigms, in Bila, a Bantu language from zone B, and Sekpele, a Kwa language.

Bila (Bantu D)		
S	SG.	PL.
1	m(i)-	ɓɪ- ~ ɓi-
2	ɔ- ~ o-, ɛ- ~ e-	ɓɔ- ~ ɓo-, ɓɛ- ~ ɓe-
3	a-	ɓá-

Sekpele (Kwa)		
S	SG.	PL.
1	N-	bo
2	a-	ba
3	o, u	ba

The comparison of these systems is enlightening in two respects. Firstly, it is easy to see that the Bila forms cannot be derived from the Proto-Bantu ones without assuming a change by analogy. Secondly, we observe the emergence of practically identical analogical features in the languages belonging to different branches of Niger-Congo, and, in this particular case, it is evident that the features have emerged independently.

Here are the features shared by both systems:

1) The plural markers are of CV structure, and singular markers are shorter: a nasal sonant for 1SG. or a vowel for 2SG. or 3SG.; 2) All the plural markers have a non-voiceless labial oral initial consonant (*ɓ-* in Bila, *b-* in Sekpele); 3) In both languages, unifications are not limited by the abovementioned features: in Sekpele, apart from the sub-morphemic unification, a full unification of the 2PL. and 3PL. forms (***ba***) took place and this has reinforced the formal marking of the category of non-locutors (2nd + 3rd person, as opposed with the 1st person), which is marked in both languages in singular by the structure V. In Bila, not only Number and Locutor semantics are marked with some formal features, but also Person: in each line of the Bila chart, singular and plural forms are characterized by identical vowels. Therefore, a moving from the 1st to the 3rd person can be described as an increase of aperture: a closed vowel *i/ɪ* is a feature of the 1st person, a mid vowel *ɔ/o/ɛ/e* marks the 2nd person, and the open vowel *a* characterizes the 3rd person.

Here are three net examples of "vertical" unifications (by Person) and "horizontal" unifications (by Number), and also an example of maximal unifications combining both techniques in one paradigm:

Day (Adamawa)		
S	SG.	PL.
1	hìɲ	ɲā
2	hà, mà	mɔ̄
3	há, hìy	mɔ́

Krobu (Kwa)		
S	SG.	PL.
1	mɛ, N	nɛ̠
2	bo	be
3	o	a

Edo (Benue-Congo)		
Disj.	SG.	PL.
1	(i)mɛ	(ì)mà
2	(u)wɛ	(ù)wà
3	irɛ̠ (a), ɛré (z)	írà̠

These paradigms can be represented by the following graphic models (where lines connect opposed forms which share certain features):

Day (Adamawa)		Krobu (Kwa)		Edo (Benue-Congo)	
SG.	PL.	SG.	PL.	SG.	PL.
1		1		1	
2		2		2	
3		3		3	

In Day, common features can be singled out for the three plural forms (**N-**) and for the three singular forms (**h-**). In Krobu, common features are characteristic, in each person, for singular and plural forms: **N** for 1SG. and 1PL., **b-** for 2SG. and 2PL., V for 3SG. and 3PL. In Edo, on the one hand, forms of the same number are tuned by the final vowel (**-ɛ** for the singular and **-a** for the plural), and on the other, there are "horizontal" tunings in the forms for each person (**m-** for 1SG. and 1PL., **w-** for 2SG. and 2PL., **r** for 3SG. and 3PL.). It is worth noting that "vertical" unifications concern also the tone: low tone for 1 ≈ 2 ≈ 3 PL. vs. mid tone for 1 ≈ 2 ≈ 3 SG.

The paradigm of disjunctive pronouns in Edo is tuned all over; in this respect, it does not differ very much from the paradigm of the possessive pronouns in French: **m-on / t-on / s-on** ~ **m-es / t-es / s-es**). The problem is that linguistic theory has no tools so far to describe these phenomena: we cannot split morphemes into meaningful segments which are not morphemes. Rare attempts to interpret such "signs" brings one into a hazy sphere of the sound symbolism which, to my mind, has not a slightest relation to the problem discussed here.

It is striking how much differently the same genetically identical material may be used for unifications going in different directions. In the numerous abovementioned paradigms, 3rd person forms betray their noun class origin: Class 1 (singular class for humans) in 3SG. and Class 2 (plural class for humans) in 3PL.; these class forms are reconstructed for the Proto-Bantu as *mu and *ßa, and for Proto-Niger-Congo, most probably as *ku/*ʔu and *ba/be.

Here are some of these forms:

	3SG.	3PL.
Bila (Bantu D)	a-	ɓá
Manjak Churo (Bak < Atlantic)	a	bá
Noon (Cangin < Atlantic)	ya, yo	ɓa
Sekpele (Kwa)	o, u	ba
Krobu (Kwa)	o	a
Mbembe (Cross-River)	o , ɔ	ma
Proto-Bantu	mu	bá
Wolof (Atlantic)	mu	ñu

In certain languages 3rd person forms cannot be derived in an evident way from Proto-Niger-Congo, as they have undergone changes by analogy with other pronouns of their paradigms (e.g., a neutralization 3PL. = 1PL. *ñu = ñu* took place in Wolof). In other languages they can still be easily derived from the proto-forms, however, they may have undergone different types of unifications: horizontal, vertical, or bilateral. It means that in such (quite numerous) cases they do not change by analogy, but rather become models for analogy changes of other forms.

In the linguistic theory, the 3rd person has bad luck. Deprived of the status of true personal pronouns, the 3rd person markers are simply expelled from the paradigms in numerous

publications (such is the database for Gur pronouns [Miehe 2004] and Kirill Babaev's publications on Benue-Congo pronouns [Babaev 2008]). Nevertheless, however evident their origin from 1st and 2nd class markers might be, these forms play key roles in the formal tuning of the members of pronominal paradigms. In particular, a typical strategy for Niger-Congo languages is to turn the initial consonant of the class 2 marker (oral labial occlusive) into a common feature for plural. As a result, "pure" personal markers, 1PL. and 2PL., become "labiality-contaminated". Sometimes this process leads to radical consequences: the initial voiced labial consonant may turn into a net plural marker thus becoming a real morpheme (as in the case of the Badyaranke language, North-Atlantic).

These facts call for a typology of pronominal systems which would answer the questions which lie on the surface: are the changes by analogy more frequent in the plural or in the singular? in the 1st or 2nd person? in the 2nd or 3rd person? in the subjective or objective paradigm? etc.

Many of these questions can be answered. So, it is certain that in the plural, unifications along the criterion Person are more frequent than in singular. As I displayed with the data on both pronominal and noun class paradigms, a stronger inclination of plural forms toward the unification by person or class can be explained, first of all, by the fact that plural forms are most often of the marked character in the opposition of Number. This rule can be roughly formulated as follows: in comparison with singular forms, plural forms are more oriented to the expression of number, therefore, they are less fitting to mark person or noun class (as a result, the number of plural noun classes is usually inferior to that of singular ones).

There are some other general trends in the distribution of unifications in paradigms. Here is one of the most current Niger-Congo models:

SG.	PL.
1	
2	
3	
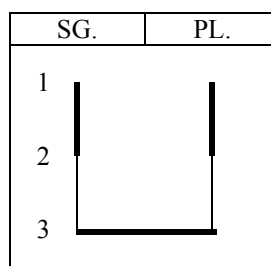
This model implies a unification of locutor pronouns by person, both in singular and plural (although the unification in plural is more current), and at the same time, unification of 3rd person pronouns by number. Let us consider several examples of such systems:

Bamana (Mande)		
Disj.	SG.	PL.
1	né‌ˋ	á̠ù̠
2	é‌ˋ	áù
3	àlé	òlú

Pambia (Ubangi)		
S	SG.	PL.
1	nyi	a
2	ɲo	i
3	ko (m), ne (f), mba (i)	ako

Sua (Atlantic)		
S	SG.	PL.
1	meN, N	nrɛ
2	mə	nə
3	ø,a	u,i

Hun-Saare (Benue-Congo)		
S	SG.	PL.
1	me, ɛm	te (excl.), a (incl.)
2	wɔ, o	nɔ
3	wɛ́	é, a (i)

In **Bamana** (Disjunctive set of pronouns), the initial low tone in 3rd person is opposed with the initial high tone of the locutor pronouns. Among the locutors, 1SG. and 2SG. (marked by *é*)

are opposed with 1PL. and 2PL. (marked by *á*). The horizontal unification in 3PL. is marked by tone and by the consonant *-l-* (whatever its origin may be).

In **Pambia,** the 3PL. form *ako* is evidently tuned to the 3SG. masculine form. Singular locutors are characterized by the CV structure and have initial palatal nasal. Plural locutors (and only they!) have the V structure.

In **Sua**, unlike in Pambia, the V structure characterizes 3SG. and 3PL., and nothing else. The locutors have a nasal sonant as their feature, and the labial nasal *m* is a feature of singular locutors, while the dental nasal *n* belongs to the plural locutors.

In **Hun-Saare**, like in Bamana, 3SG. ≈ 3PL. are tuned by a specific tone, which does not appear in locutor pronouns. The common mark of 1PL. ≈ 2PL. is an initial dental consonant and that of 1SG. ≈ 2SG. – a labial one.

The very first idea that comes to mind in the domain of sub-morphemic unification is that of the typology of distribution of the unified forms, and to begin with, their statistics. An attempt to build such typology based on statistic data is proposed in the paper by Guillaume Segerer for this conference. He has proven that various unifications in paradigms do exist. On the other hand, it is clear that any linear "one-dimensioned" typology would not help us to describe the principles of a distribution of unified forms, and it is for 2 main reasons:

1) In one language, full (as well, as partial) unifications of oppositions by Person or Number, as a rule, manifest complementary distribution among different paradigms. Quite typically, in an objective paradigm 1SG. and 2SG. may have a feature in common, while in the subjective paradigm there is none. In other words, the subjective paradigm appears as the distinctive context (the "strong" context), and the objective paradigm as the neutralization context (most often, it is a partial neutralization). That is, the fact of partial unification, say, of 1PL. and 2PL. in a language cannot serve an adequate basis for the typology of unification 1=2 SG. Complementary distribution was shown by the Wolof example where 1PL. and 3PL. forms are identical in the subjective paradigm, 2PL. and 3PL. forms are identical in the objective and possessive paradigms.

2) Partial unifications inside a paradigm and among paradigms tend to be in complementary distribution with full unifications. More precisely, partial unifications manifest themselves where full unifications are undesirable, this being a more aggressive strategy leading to the loss of distinctive power of the members of a paradigm. Thus, in Niellim, 1PL.EXCL. = 2PL. (*í*, full linking), while 1SG. ≈ 2SG. (*ǹ* ≈ *m̀*, nasal consonant plus low tone, partial linking).

It means that a typology of formal unifications in the pronominal systems is not linear. Rather, it should be represented as a tree with various knots and links which hierarchy is of great theoretical interest.

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