

THE LOCUS OF PLURACTIONAL REDUPLICATION IN IN WEST CHADIC*

Russell G. Schuh
UCLA

Reduplication of a root initial syllable is the productive method of forming pluractional verbs in Hausa and a number of other Chadic languages. This has led to an assumption that initial reduplication is the norm and, tacitly, that it is probably a reconstructable feature for the family. Both language internal and comparative evidence shows that this is not the case. Newman (1989) has argued, on the basis of “frozen pluractionals”, that Hausa originally employed root final reduplication. The shift to root initial reduplication arose through reinterpretation of reduplication in biconsoantal roots as “prefixation”. Bade and Miya still have non-initial reduplication as the norm. Bole, which, like Hausa, has prefixation as its only modern productive pattern, has undergone an evolution much like that of Hausa, but in Bole, the original situation has been obscured by changes affecting original non-initial reduplicated syllables. The Chadic picture presented here jibes with a broader Afroasiatic picture, where non-initial reduplication or consonant doubling is also the norm.

1. Reconstructing the Locus of Hausa Pluractional Reduplication

Pluractional verb formation is ubiquitous in Chadic languages. Pluractional verbs indicate repeated action, whether by one agent acting repeatedly, multiple agents acting individually or in succession, action affecting one patient multiple times, action affecting multiple agents, or combinations of these meanings. Thus, one can use the pluractional form of Hausa **kòrā** ‘chase, drive off’ in a sentence such as **mun kàkkòri awākī** to mean ‘we [individually] chased away goats [as a group]’, ‘we [as a group] chased away goats [one at a time]’, ‘we [as a group] have [repeatedly] chased away goats [as a group]’, and various combinations of these meanings amenable to plural action.

In Hausa, by far the best documented Chadic language, the productive pattern of verbal pluractional formation doubles the first CVC of a verb stem, with certain phonological processes usually modifying the final consonant of the initial syllable and/or its vowel, as in the examples in (1).

- (1) a. **fita** ‘go out’ → /fit-fita/ → [fīřfita] (→ [fiffita])
b. **dafà** ‘cook’ → /daf-dafà/ → [daddàfà]
c. **kāgà** ‘invent’ → /kāg-kāgā/ → [kakkāgā]
d. **sōmà** ‘begin’ → /sōm-sōmā/ → [sansōmā] (→ [sassōmā])
e. **jēfà** ‘throw at’ → /jēf-jēfā/ → [jàjjēfà]
f. **kòrā** ‘chase off’ → /kōr-kōrā/ → [kàřkōrā] (→ [kàkkōrā])

Phonological changes evident in the data in (1) are as follows:

- shortening of long vowels in closed syllables and lowering of shortened mid vowels in (1c-f)

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- change of alveolar stops and flapped **r** to trilled **ř** in (1a, f)
- assimilation of nasals to place of articulation in (1d)
- obligatory geminate assimilation of non-alveolar obstruents and nearly obligatory (in fact, probably obligatory for many speakers) for all other sounds

Virtually all traditional descriptive grammars of Hausa, and all pedagogical grammars describe Hausa verbal pluractional formation in pretty much this way, i.e. as a process that prefixes a syllable to the beginning of the word by doubling the first CVC of the root. See, for example, Abraham (1959:74-75), Maxwell and Forshey (1973:155), Kraft and Kirk-Greene (1973:176-77), Cowan and Schuh (1976:332-333). The great productivity of this process in Hausa and its oft-repeated description has caused those of us who have studied Hausa for many years to think of initial reduplication for pluractional formation to be the “natural” way to do things. One can find data from other West Chadic languages that would seem to reinforce this view.

(2)	BOLE:	'yoru- 'stop'	→ 'yo'yoru-
		kùrā- 'surround'	→ kùkùrā
		dā'yu- 'step on'	→ dādā'yu-
	BADE:	m̄tu 'die'	→ mām̄tu
		ḃ̄ru 'peel'	→ ḃ̄ḃ̄ru
	MIYA:	tsər 'stop'	→ tsatsəra
		tiy 'beat'	→ tatiya

As in Hausa, all the examples in (2) add a reduplicated syllable to the beginning of the word. The main differences from Hausa are, first, that in these languages, the basis of the reduplicant is just the initial consonant, not the first CVC, and, second, that in Bade and Miya, the vowel in the reduplicated syllable is invariably **-a-** rather than a copy of the root vowel. We return to these issues below.

A brief but significant paper by Paul Newman (Newman 1989) forces us to take a new look at Hausa pluractional reduplication, at Chadic pluractional reduplication in general, and ultimately at what must be homologous processes in Afroasiatic. Consider the data in (3) from Newman's paper:¹

(3)	a.	yagalgālā	'tear to shreds'
		kucincìnā	'break pieces off'
		taḃarkàrē	'strive hard'
	b.	tuntùnā	'remember' (cf. tunā)
		kaḃkāmā	'catch' (cf. kāmā)
		fīřfīta	'go out' (cf. fīta)
	c.	kakkàryā	'break up' (cf. karyā)
		yayyànkā	'cut up' (cf. yankā)
		guggutsùrā	'break pieces off' (cf. gutsùrā)

The verbs in (3a) all reduplicate the FINAL CVC of the verb rather than the initial CVC. Significantly, none of these verbs have modern non-reduplicated counterparts, i.e. there are no verbs ***yagala**, ***kucina**, ***taḃare**. The verbs in (3b) would appear to be examples of

¹ See also Newman (2000), Chapter 55 and pages 518-519, for more extensive discussion of Hausa pluractional formation, including expanded discussion of “frozen pluractionals”.

initial CVC reduplication of the roots in parentheses, following the interpretation presented in (1). Note, however, that the reduplicated forms in (3b), and also those in (1), have an ambiguous interpretation. Since there are only two root consonants they could be either initial reduplication (“prefixation”) or final reduplication (“suffixation”). On the other hand, the verbs in (3c), with three root consonants each, unambiguously have initial CVC reduplication.

Hausa has a fairly large number of “frozen pluractional” verbs like those in (3a), without a non-reduplicated counterpart. Only a handful of modern Hausa simple verbs are paired with pluractionals of this type, e.g. *tàfasà* ‘boil’ with pluractional *tàfàřfasà*. Such pluractionals are clearly archaisms. Most verbs of three or more consonants allow only the pattern in (3c), loanwords never take the (3a) pattern, and for some verbs where types (3a) and (3c) co-exist with different meanings, the (3a) form has the less predictable meaning, a sign of lexicalization rather than productive derivation, e.g. *kìrgà* (< **kìdgà*) ‘count’ with (3c) type pluractional *kìk̀k̀ìrgà* ‘count repeatedly’ and (3a) type pluractional *k̀ìd̀ìd̀ìgà* ‘calculate’.

The dramatic insight of Newman’s paper is that FINAL reduplication of type (3a) must be the original method of forming verbal pluractionals in Hausa. The biconsonantal verbs of type (3b) are the bridge between final reduplication (“suffixation”) and initial reduplication (“prefixation”) as the productive method of pluractional formation. As already noted, the verbs in (3b) are ambiguous in their morphological interpretation—they could be viewed as reduplication to either the right or the left. Newman points out that if reduplication is to the right, it is, ironically, the original root that is deformed by the regular phonological processes of Hausa, whereas the reduplicant suffix is a copy of the underlying root! For example, the root *k̀òr-* of ‘chase off’, seen in (1f), becomes *k̀ak-* under a suffixing analysis, whereas the reduplicant suffix, *-k̀òr-*, is identical to the root. Speakers took the natural step of assuming that the original reduplicant suffix IS the root and that the original root is a (deformed) reduplicant prefix. They then regularized pluractional formation by making it a prefixing rule for all verbs, regardless of base root structure.

In the remainder of this paper, I will show that Newman’s proposal that Hausa pluractional formation originally reduplicated the end of a root rather than the beginning receives comparative support from Hausa’s Chadic cousins, though the issue is not so much “suffixation” vs. “prefixation” as it is the algorithm for selecting which part of the root will serve as the basis for reduplication. Once such an algorithm emerges, we arrive at an understanding of apparent anomalies of pluractional formation in other languages. I conclude by briefly identifying apparent homologues to Chadic pluractional formation in other Afroasiatic languages, none of which seem to have initial reduplication.

2. Pluractional Formation in Bade²

Bade has four pluractional patterns, differing according to the structure of the simple verb root. Simple roots of the type in (4b), all historically from **CəC-*, now have the shape *CəC-* or *əCC-* depending on whether or not the consonants form a permissible sequence. See Schuh (1978) for discussion of this historical development in Bade as well as for other information on Bade phonology, particularly the vowel system).

² I collected most of the data in this section in 1983 from Abubakar Hassan Fulata, who was a student at Ahmadu Bello University but who originated from the Bade-speaking town of Madamuwa. The data first appeared in print in Newman (1990:Chapter 3).

(4)	ROOT TYPE	SIMPLE VERB	PLURACTIONAL	
a.	C-	po	pəpo	‘pour’
		võ	vəvo	‘shoot’
b.	*CəC-	m̄tu	m̄m̄tu	‘die’
		əfku	f̄əfku	‘enter’
		ʃəru	ʃəʃəru	‘peel’
		vəru	f̄əvəru	‘go out’
c.	CăC-, C̄VC- ³	ḡəfu	ḡəf̄əfu	‘catch’
		m̄əs̄u	m̄əs̄əs̄u	‘buy’
		k̄əlo	k̄ələlo	‘have a meal’
		m̄ətu	m̄ət̄ətu	‘glance’
d.	C̄VC(V)C...	z̄əmtu	z̄əməmtu	‘wrench out’
		k̄ərmu	k̄əràrmu	‘chop’
		n̄ətu /n̄əwtu/	n̄əw̄əutu	‘pass’
		k̄iḏu /k̄əyḏu/	k̄iȳəyḏu	‘eat (meat)’
		t̄lərḡədu	t̄lərḡəḡədu	‘destroy’

Pluractional verbs in Bade always differ from the simple root by addition of a CV syllable. If the root is monoconsonantal (4a), the pluractional verb has the form CəC-. If the root is historically from *CəC- (4b), the pluractional doubles the first consonant, adding a syllable Ca- (see below for length of the vowel). If the root has two consonants with a vowel other than -ə- (4c), the pluractional doubles the SECOND consonant, adding a syllable -Cə-. For roots with three or more consonants (4d), the pluractional inserts a syllable -Ca-, where the consonant is the penultimate consonant of the root.

Two questions arise: (i) What is the algorithm for choosing the consonant to be reduplicated? (ii) What is the DIRECTION of reduplication? In answer to the first question, monoconsonantal roots (4a) reduplicate the only available consonant, and roots with three or more consonants (4d) reduplicate the penultimate consonant.

There seems to be a conflict for roots with two consonants, since verbs of type (4b) usually reduplicate the first consonant while those of type (4c) reduplicate the second consonant. The pattern in (4b) is the productive pattern for *CəC roots. This is the pattern volunteered in elicited data and commonly found in non-elicited textual examples, but I have found a few lexicalized forms such as əsk^wək^w ‘spend time’ < *əsk^w < *sək^w and a few examples in texts such as z̄iȳəyu ‘wage war’ < z̄iyu where it is the second consonant that is reduplicated. Roots of type (4c) thus seem to waiver between patterning with type (4d), which invariably reduplicates the penultimate consonant, and type (4b) which invariably reduplicates the final consonant. The comparisons in (5) suggest a reason for this variation.

(5)	PENULTIMATE C REDUPLICATED	FINAL C REDUPLICATED
(4d)	k̄à-rà- ḥ mu ‘chop’	(4c) m̄à-sə- ḥ u ‘buy’
(4b)	m̄à- m̄ tu ‘die’	(4b) z̄i-yà- y u ‘wage war’

³ The only long vowels relevant for this pattern are -ā- and -ē-. For pluractional formation, phonetic -ō- is treated as underlying /aw/, phonetic -ī- as /əy/, and phonetic -ū- as /əw/.

Non-derived native Bade verb roots are restricted in their vowel patterns. In a root of two or more consonants, the only vowels will be **a** (long or short) between the first and second consonants (**màsu** ‘buy’, **dàsu** ‘plug up’, **kàrmu** ‘chop’, **ràkènu** ‘travel’) or **ə**’s needed to assure proper syllabification, in particular to assure that a syllable does not begin or end in two consonants (**əfku** ‘enter’, not ***fku**, **tərgèdu** ‘destroy’, not ***tərgdu**⁴) and to break up a sequence of an obstruent followed by a sonorant (**ràkènu** ‘travel’, not ***ràknu**⁵). Let us call **a** (long or short) a “lexical” vowel and **ə** an “inserted” vowel. Verbs of type (4b) are like those of (4d) in that a lexical vowel does not separate the last two consonants. A reduplicated structure **-C_iaC_iC_j-** can thus be built by adding a **-Ca-** syllable built on the penultimate consonant. This portion of the verb itself has the canonical structure of a simple triconsonantal root (compare unreduced **kàrmu** ‘chop’ and reduplicated **màm̄tu** ‘(several) die’).

On the other hand, verbs of type (4b) resemble those of type (4c) in being biconsonantal roots. With type (4c) verbs, creating a **Ca** reduplicated syllable based on the penultimate (= first) consonant would create a three consonant verb with lexical vowels in consecutive syllables, e.g. **màsu** ‘buy’ → ***mamasu**, a non-existent structure in non-derived native verbs. To avoid this, the last consonant is reduplicated, with **ə** inserted to prevent a geminate cluster, which is disallowed in Bade. Doubling of the last consonant is also at least marginally available to verbs of type (4b). However, these verbs have a non-lexical **ə** in the first root syllable.⁶ Adding the more canonical **Ca** reduplicated syllable is thus acceptable.

My interpretation of the (4c) **CaCəC-** pattern (**màsəsu**) vs. the (4b) **CəCaC-** pattern (**zìyàyu**) is a rhythmic one. Though Bade does not have stress *per se*, syllables with only a **ə** vs. a syllable with a lexical vowel are similar to unstressed vs. stressed syllables respectively in English. The vowel patterns here create a sort of alternating “stress” pattern. Though true stress differences do not exist in Bade, syllable WEIGHT does play an important role. In the data table in (4), the reduplicated syllables in (4b) and (4c) verbs usually undergo vowel lengthening. This seems to be a (not always exploited) way of creating alternating weight. Note that reduplicating verbs of type (4d) usually yields a Light-Heavy-(Light)⁷ pattern as an automatic result, e.g. **kà-ràr-mu**. Verbs of types (4b) and (4c), were they to simply add a CV reduplicated syllable, would have a Light-Light-(Light) pattern, but by lengthening the reduplicated syllable they attain a Heavy-Light-(Light) rhythmic pattern, e.g. ***mà-sə-su** → **mà-sə̄-su**. Newman (2000:519-520) points out a similar rhythmically motivated phenomenon in Hausa pluractionals. The CVC reduplication of Hausa always creates a heavy syllable. A number of verbs with lexical long vowels have (semi-)lexicalized pluractionals with shortened vowels, e.g. **tārà** ‘gather’ → **tattārā**, **dūkà** ‘stoop down’ → **duddūkā** ‘crouch’. This shortening creates a Heavy-Light-(Heavy) pattern instead of the predicted Heavy-Heavy-(Heavy). As in Bade, however, this rhythmically motivated alternation does not apply as a general phonological rule, e.g. Bade **ḃà-ḃə̄-ru** ‘peel’ with Light-Light-(Light) and Hausa **zàz-zā-gā** ‘repeatedly abuse’ with Heavy-Heavy-(Heavy).

A second question that I raised above with respect to Bade pluractional reduplication was, “What is the DIRECTION of reduplication?” At least for reduplication involving a **Ca** syllable, it seems fairly clear that it is the **Ca** syllable that is added, i.e. that this is the

⁴ The initial **tl-** is a digraph representing a lateral fricative, not a consonant sequence.

⁵ In contrast to most Chadic languages, Bade does allow long vowels in closed syllables, so preservation of an open syllable to accommodate the long **à** of the first syllable cannot explain the presence of the **ə**.

⁶ The **-i-** in the first syllable of the example verb **zìyu** ‘wage war’ is /ə/ that has assimilated to the following **y**.

⁷ In fact, the pattern is Light-Heavy-“Neutral”. Phrase final syllables do not contrast rhythmically.

reduplicated syllable.⁸ If this is the case, then reduplication is always to the left, resulting in prefixation of verbs of type (4b) but infixation for type (4d). Above, I suggested reasons for why verbs of type (4c) have a **-Cə-** syllable rather than **Ca**, but there is no reason to think that these verbs do not also add the reduplicated syllable before the base consonant rather than after, creating infixal reduplication.

With this analysis of Bade reduplication, we can now return to Newman's (1989) hypothesis that the older method of pluractional reduplication in Hausa was suffixation rather than prefixation, which is clearly the productive pattern today. The Bade data suggests that the issue is not so much "suffixal vs. prefixal reduplication", as stated in the title of Newman's paper, but of what part of a root is the basis of reduplication. The fact that the archaic pattern in Hausa reduplicates the final CVC, combined with the fact that in Bade the reduplicated syllable is always based either on the final root consonant or the penultimate root consonant, provides strong evidence that the reconstructable pattern of pluractional reduplication for proto-West Chadic was NOT to create a reduplicative prefix based on the INITIAL C(V) of the root. On the other hand both Hausa and Bade lend themselves to an interpretation that the reduplicant is now and has always been inserted BEFORE ITS BASE. Thus, the change that has taken place in Hausa to give pluractionals of type (3c) instead of the older pattern of (3a) is not a change from suffixation to prefixation, but rather a reinterpretation that says, "Take the first CVC of a root and double it," rather than the older pattern that said, "Take the final CVC of a root and double it."

3. Pluractional Formation in Miya

Like Bade, Miya has several pluractional formation strategies, varying according to the shape of the underlying root. Indeed, the differing strategies exactly parallel those of Bade. I omit tone in the Miya data. Tonal classification of Miya verbs is a complex topic, and I was not able to fully work out how tone of the simple root relates to tone of the pluractional counterpart. Tone is irrelevant to the segmental structure of pluractional formation in any case. See Schuh (1998:175-178) for fuller discussion.

(6)	ROOT TYPE	SIMPLE VERB	PLURACTIONAL	
a.	C-	za	zəza	'enter'
		pa	pəpa	'collect'
b.	CəC-	tsər	tsatsəra	'stop'
		tiy	tatiya	'beat'
		bəta	babəta	'untie'
		zəna	zazəna	'spread to dry'
c.	CaC-⁹	bal	bāla	'break (rope)'
		tlakə	tlāka	'scrape'
		kafə	kāfa	'send'

⁸ Alternatively, one could propose insertion of **-aC-** AFTER the consonant on which the reduplication is built. Roger Billery-Mosier proposed this analysis in a UCLA seminar that I gave on Bade and Ngizim phonology. I have no principled arguments against this analysis, but it runs counter to Bade morphology in particular and Chadic morphology in general, where essentially all affixation involves addition of consonant initial morphemes.

⁹ The only lexical vowel that can appear in a non-derived, native **CVC-** verb root in Miya is short **-a-**. Moreover, no such verbs belong to the final **-a** class of verbs.

d.	CVC(ə)C-	tsəryə	tsarya	‘step on’
		təkən	takəna	‘beat (drum)’
		ɸuwyə	/ɸawya/ → ɸōya	‘break (stick)’
		dadəm	dadəma	‘repair’

As in other West Chadic languages, Miya verbs fall into two final vowel classes: an **-a** class and, in Miya, a **Ø/ə** class. For simple roots, verbs in the **-a** class are found only among **C-** and **CəC-** roots. However, Miya is unusual from a comparative point of view in that all pluractionals are final **-a** class verbs. Pluractional verbs in other languages generally fall into the same lexical class as their base verb roots. Aside from this innovative aspect of Miya, pluractional formation in Bade and Miya descends from a system that can be traced at least to proto-West Chadic-B, the sub-group to which both languages belong (Newman 1977).

- (7) a. **C-** → **CəC-**
 b. **C₁əC₂-** → **C₁aC₁əC₂-**
 c. **C₁aC₂-** → **C₁aC₂əC₂-**
 d. **C₁VC₂C₃** → **C₁VC₂aC₂C₃**

This system survives into Bade with little change—see (4). It also survives into Miya with little change in the (7a) and (7b) types—cf. (6a) and (6b). In type (7c), Miya has pluractionals of the form **CāCa**, i.e. instead of a short **-a-** in the first syllable, there is a long **-ā-**, and pluractional does not have a copy of **C₂**. Like Bade, Miya does not permit geminate sequences. To avoid a geminate sequence in type (7c), Bade separates **C₂** and its copy with a **-ə-**. I propose the following scenario for Miya:

- (8) **C₁aC₂-** → **C₁aC₂əC₂-** → **C₁aC₂C₂-** → **C₁āC₂-**

That is, at some point, Miya syncopated the **-ə-** separating the reduplicated **C₂**, then reduced the impermissible geminate with compensatory lengthening of the preceding **-a-**.¹⁰

The path for deriving Miya pluractionals of type (6d) is less straightforward. I tentatively propose the following scenario:

- (9) **C₁əC₂C₃-** → **C₁əC₂aC₂C₃-** → **C₁aC₂əC₂C₃-** → **C₁aC₂C₂C₃-** → **C₁aC₂C₃-**

It seems clear that the **-a-** in the first syllable of pluractionals like **tsarya** ‘step on repeatedly’ (<**tsəryə**) is a reflex of the **-a-** of the reduplicated ***Ca** syllable. Nearly all Miya triconsonantal roots have **-ə-** as the vowel in the first syllable. In the third stage in (9), the **-ə-** of the first root syllable and the **-a-** of the reduplicated syllable metathesize. This is followed by syncope and geminate reduction as in (8). Miya is like most other Chadic languages in not allowing long vowels in closed syllables, so for pluractionals like **tsarya**, compensatory lengthening concomitant with geminate reduction is blocked. In pluractionals like **takəna** ‘beat a drum’, the vowel in the first syllable is not lengthened even though it is in an open syllable. It may be that the pattern has been regularized so that verbs of type (6d) conventionally have a short **a** in the first syllable, or it may be that the **-ə-** in the second

¹⁰ In elicited data, I got a couple of cases with a full **-C₂a-** syllable added, e.g. **ɸalala** ‘break rope’. The most consistently volunteered forms were those in (4c), and that is the only type that I have found in texts.

syllable is “transparent” since it is present only to prevent the impermissible sequence ***-kn-**. Note that for the small number of verbs like **ɗaɗəm** ‘repair’, with an **-a-** in the root syllable, the only difference between the simple root and the pluractional is the shift of the verb to the final **-a** class.¹¹

4. Pluractional Formation in Bole

Bole has three types of pluractional formation. The only fully productive type reduplicates the initial **CV** of the verb. This type is available for all verb classes, and for most verbs, it is the only available type. A second type infixes **-gi-** after the first root syllable. This type is available only for a subset of **CVC-** roots. A third type geminates the second consonant. Like the infixed type, geminate pluractionals are available only for a subset of **CVC-** roots. With only two or three exceptions, a single **CVC-** root will not use both infixed and geminate pluractionals. Monoconsonantal roots represent a special case. A minority use the reduplicative prefix type, but most have a pattern akin to the geminate pluractional, in which a geminate glottal stop is inserted after the root. I will assume, based on comparative evidence, that the reduplicative prefix type is the older type for monoconsonantal verbs and that insertion of a geminate glottal stop is an innovation, modeled after the geminate type used with **CVC-** roots. In the description here, I will not further discuss monoconsonantal roots, and I will not discuss details having to do with productivity and slightly different meanings associated with alternative pluractionals used with the same root. See Gimba (2000:Chapter 10) for a comprehensive discussion of Bole pluractional morphology and meaning.

Lukas (1970-72) proposed five verb classes for Bole. This classification provides a useful framework for discussing pluractionality. In (10) I present verbs for each class, with examples of pluractionals available for each class. Recall that only the prefixal **CV** reduplicative pattern is fully productive (except for monoconsonantal verbs, where a minority of verbs operate this pattern).

- A1 verbs have the form **CVCu** in the completive
- A2 verbs comprise all verbs ending in **-u** in the completive other than class A1, i.e. verbs with a long vowel in the first syllable or with more than two consonants
- B verbs have the form **CVCā** in the completive
- C verbs have the form **Cī** in the completive
- D verbs have the form **Cā** in the completive

(10)	LUKAS CL.	PLURAC. TYPE	ROOT	PLURACTIONAL	
a.	A1	Red. pref.	'yuru duru	'yo'yuru duduru	‘stop, stand’ ‘jump’
		Infix	'yuru duwu	'yògìru dùgìwu	‘stop, stand’ ‘kill’
		Geminate	ɗolu njilu	ɗòllu njìllu	‘swallow’ ‘pinch off’

¹¹ The verb **ɗaɗəm** ‘repair’ is itself a frozen pluractional of type (6b) from a **CəC** root ***ɗəm**, with deglottalization of the reduplicative prefix. A root of this shape actually exists in Miya in the meaning ‘do’, but the word ‘repair’ cannot be derived directly as its pluractional because **ɗaɗəm** is not an **-a** class verb, the class into which all pluractionals fall. It appears that this pluractional may have become frozen as early as proto-West Chadic-B. It exists in some Bade dialects as **ɗaɗəmu**, but in others, it has become **ɗàlmu** or **ɗànmu**.

b.	A2	Red. pref.	dà'yu	dàdà'yu	'step on'
			bòltu	bòbòltu	'break (stick)'
			dàndfu	dàdàndfu	'touch'
c.	B	Red. pref.	bùlā	bùbùlā	'dig up'
			zìngā	zìzìngā	'peep'
	Infix	'àwā	'àgìwā	'open'	
		kàrā	kàgìrā	'slaughter'	
	Geminate	pātā	pàttā	'go out'	
		kàrā	kàrrā	'slaughter'	
d.	C	Red. pref.	tī	titī	'eat'
		Geminate	rī	ri"ī	'enter'
e.	D	Red. pref.	pā	papā	'close'
		Geminate	pā	pa"ā	'close'

Consider first the geminate pluractionals. One of the first things that strikes anyone looking at Bole is the large number of verbs with geminate C_2 . Most of these have no counterpart with a singleton consonant, e.g. **bìkku** 'accept', **zàbbu** 'be spoiled' but no ***biku** or ***zabu**. Of these verbs, Newman (1990:70) says,

"Although geminate pluractionals are rare synchronically, it seems that this was not the case earlier. One of the distinctive characteristics of Bole is the large number of verbs in the language that contain a geminate consonant. These verbs are most likely frozen pluractionals that, like many of the frozen pluractionals in Hausa, have lost their distinctive semantic properities."

Newman seems to imply that the geminate pluractionals of Bole and closely related languages represent a basic type of pluractional formation. This may be true at the rather shallow level of the West Chadic subgroup to which Bole belongs, but at a deeper level, these geminates must have come from **CV** reduplication.

In Schuh (2001:6), I claimed that "by far the most common method for pluractional formation throughout Chadic is reduplication of the *initial CV-* of the root" (*italics added*). Working from this claim, I proposed that Bole geminate pluractionals derive from **CV** reduplicative prefixation, followed by syncope and geminate assimilation, e.g. **d'olu** → ***d'o-d'olu** > ***d'o-d'-lu** > **d'ollu** (cf. 10a). The claim about the prevalence of **CV** prefixal reduplication may or may not be true for modern Chadic languages, but data from the previous sections of this paper show that it was not the case in earlier stages of West Chadic. Comparative data suggest that a more plausible scenario leading to Bole geminate pluractional formation involves C_2 reduplication of the type in (7c), which gave Bade pluractionals of type (4c) and Miya pluractionals of type (6c). The Bole scenario would thus be as in (11), with **-i-** being the Bole epenthetic vowel, as it is today.

(11) $C_1VC_2- \rightarrow C_1VC_2iC_2- \rightarrow C_1VC_2C_2-$

This scenario does not require the gratuitous assimilation required in the **CV** reduplicative prefixing scenario, which is problematic since Bole always separates unlike consonants with an epenthetic vowel unless they form a permissible sequence, and if they form a permissible sequence, geminate assimilation never takes place! More important, the scenario in (11) jibes with the process in Bade and Miya, a process that builds a reduplicant

on the FINAL consonant. Finally, in Tangale, a language closely related to Bole, an apparent cognate method of pluractional formation still uses C_2V reduplication, e.g. **pukɛ** → **pukukɛ** ‘to water’, **teɛ** → **teɛteɛ** ‘to roast’ (Jungraithmayr 1991:40-41).¹²

I believe that infixal pluractional formation in Bole has the same source as geminate pluractional formation. The infixal pluractional would have started as in (11), but instead of syncopating the epenthetic **-i-** to produce a geminate, the reduplicated syllable was reanalyzed as an invariable **-CV-** infix rather than a reduplicant based on a root consonant,¹³ e.g. **'yuru** → ***'yo-ri-ru** → **'yo-gi-ru**. This hypothesis raises (at least) two questions: (i) Why has the vowel syncopated in some cases but not others? and (ii) what motivated a reanalysis to an invariable **CV** infix in place of a reduplicated syllable? With current data, I do not have unequivocal answers to either of these questions, but I speculate along the following lines.

With reference to (i), it may be significant that the infixed pluractional is restricted to roots where C_2 = a sonorant consonant or **ɗ** (Gimbal 2000:§10.1.3.1), i.e. syncopation may have taken place more readily to produce geminate obstruents than geminate sonorants. This predicts that there would be few, if any geminate pluractionals where C_2 = a sonorant consonant or **ɗ**. This prediction is not born out. Counting both frozen pluractionals and pluractionals with extant verbs, there are about equal numbers of geminate and infixed pluractionals where C_2 = a sonorant consonant or **ɗ**.¹⁴ Nonetheless, it may have at one time been the case that certain environments more readily lent themselves to syncopation than others.

With reference to (ii), the answer may simply be a case of reanalyzing the infixed **CV** as a lexical affix rather than a reduplicant affix created “on the fly” from one of the root consonants. This reanalysis could have been facilitated by sound change. Intervocalic labial and velar consonants have been subject to weakening in Bole, especially before round vowels. The completive, which ends in **-u** for class A1 verbs, is, in some ways, the “unmarked” verb form and creates an environment for labial and velar weakening. For example, the verb **duwu** ‘kill’ in (10a) comes from ***duku** (cf. Hausa **dōkā** ‘beat’), the verb **gowu** ‘hit, beat’ comes from ***gobu** (cf. Ngamo **gop-ko** and probably Hausa

¹² I call this Tangale pluractional type an “apparent cognate” of Bole geminate pluractional formation. Tangale has another pluractional type found with verbs that have a long vowel in the simple root. This type of pluractional devoices C_2 and shortens the root vowel, e.g. **kāzɛ** → **kasɛ** ‘to fell’ (Jungraithmayr 1991:42). Tangale has regularly voiced intervocalic singleton obstruents. The voiceless consonant in the pluractional comes from an original geminate, a fact that also explains why the vowel is shortened. This Tangale type is related to what Newman (1974:72) calls “plural verb stems” in Kanakuru, a language closely related to Tangale. These stems alternate a sonorant in the simple verb stem with a voiceless stop in the plural verb stem, e.g. **gōwe** → **gōpe** ‘to pass by’. As in Tangale, this alternation arose from weakening of singleton intervocalic obstruents but retention of geminates, followed by later degemination. Kanakuru plural verb stems, limited to a small number of verbs, are the reflex of geminate pluractionals, but in Kanakuru they are specialized to showing agreement with plural subjects of intransitive verbs and plural objects of transitive verbs.

¹³ The Fika dialect of Bole uses a **-gi-** infix. In the Gadaka dialect, the pluractional infix is **-ki-** or **-ku-** (choice of vowel is locally conditioned) rather than **-gi-**. Aside from this infix, **k** corresponds to **k** and **g** to **g** in these dialects, suggesting that the infix has not been inherited as such, but represents generalization of a particular consonant, which may differ depending on dialect. Tangale has a pluractional type with infixal **-p-**, e.g. **edi** → **epte** < ***e-p-de** ‘to eat something hard’ (Jungraithmayr 1991:41). Following the hypothesis for Bole here, I suggest that this pluractional type originally reduplicated C_2 with reanalysis and generalization of **p(V)**.

¹⁴ In our current database of over 600 verbs, the following counts for C_2 emerge: **r** has 3 geminate, 7 infixed; **l** has 12 geminate, 7 infixed; **m** has 2 geminate, 1 infixed; **n** has 2 geminate, 4 infixed; **y** has 2 geminate, no infixed; **w** has 6 geminate, 5 infixed; **ɗ** has 4 geminate, 1 infixed.

bugà with methathesis). If the reduplicated pluractional co-existed in (semi-)lexicalized form with the simple root, and if the original C_2 weakened before completive **-u** but not in the reduplicant, the language would have had earlier and later stages as in (11):

(11) Earlier: ***duku**/***du-ki-ku** Later: **duwu/du-ki-wu**

Once some verbs, particularly those with C_2 = velar, had infixes that were not obviously derived from a root consonant, the internal **-CV-** was a candidate for reanalysis as a simple **CV** infix with a fixed **C** for all verbs, and this affix spread to other roots, regardless of specific C_2 .

Finally, let us consider reduplicative prefix pluractionals, the only productive type of pluractional in modern Bole. Bole differs from Bade (and presumably Miya) and is like Hausa in that the productive pluractional reduplication process involves only reduplicative PREFIXES. Bole appears to have undergone a shift parallel to that in Hausa, with biconsonantal verb roots representing the pivot. In Bade and Miya, we saw that choice of consonant for the reduplicative base differs depending on root structure. For **CaC-** verbs, the FINAL consonant is the base, but for all other verbs of two or more consonants, the PENULTIMATE consonant is the base. This includes **CəC-** roots, where the penultimate consonant happens to also be the initial consonant, with the result that the reduplicated syllable is a prefix.

Unlike Bade and Miya, there is no correlation in Bole between the vowel of a **CVC-** root and the type of pluractional it takes. Our current knowledge of comparative Chadic phonology, particularly of vowels (Schuh 1984), does not give a clear picture of how the root vowels of Bole A1 and B class verbs correlate with those of verbs in other Chadic languages. Suffice it to say that the Bade and Miya evidence suggests that at one time Bole (or a not-too-distant ancestor) differentiated **CVC-** roots for pluractional formation, reduplicating C_2 of some (those that today have geminate and infixal pluractionals) but C_1 of others (those that today have reduplicative prefixes).

It is the latter type that has served as the model for prefixal reduplication for class A2 verbs, in the same way that disyllabic verbs have served as the model for **CVC** prefixal reduplication for all verbs in Hausa. Thus, a verb like **dàndu** ‘touch’ originally probably had a pluractional like ***dan-d̥i-d̥u** or ***da-ni-nd̥u**, but on the model of biconsonantal pluractionals such as **daku** → **da-daku** ‘pound in mortar’, polyconsonantal roots now always reduplicate the initial consonant, forming a prefix, i.e. **dà-dàndu**.

In Hausa, frozen pluractionals like those in (3a) provide ample evidence of an earlier period in Hausa when it was the FINAL CVC that was reduplicated. If, indeed, Bole has undergone a similar shift from final reduplication to initial reduplication, we would expect to find some frozen pluractionals among Bole A2 verbs where C_2 or C_3 is reduplicated rather than C_1 as in (11b). There are no such verbs. As noted above, many biconsonantal roots (verbs of classes A1 and B) have pluractionals formed by infixation of **-gi-** and/or by gemination of C_2 . For frozen pluractionals, it would thus make sense to look for similar infixes and/or internal geminate consonants rather than reduplicated syllables. There are, in fact, a substantial number of verbs with these patterns.

(12)	ORIGINAL ROOT	FROZEN PLURACTIONAL	
a.	* barlu	bàrgìlu	‘sprain’
	* d̥anlu	d̥àngìlu	‘cling to’

	*sun(u)nu	sùnkùnu ¹⁵	‘sniff at’
	màrd̥u (still used)	màrk̥d̥u	‘wring out’
	mùsd̥u (Gadaka dialect)	mùsk̥d̥u	‘feel nauseous’
b.	*zu’y(i)ru	zù’ỳy̥ru	‘purse lips’
	*lok(i)d̥u	lòkk̥d̥u	‘become entangled’

Presumably, those in (12a), with infixes **-gi-/-ki-/-ku-**, based the pluractional reduplication on **C₃**, whereas those in (12b) based the pluractional reduplication on **C₂**. I have no explanation for this difference, nor can I suggest at this time whether Bole or Bade and Miya, which always base pluractional reduplication on the penultimate consonant of polyconsonantal roots, represent the reconstructable situation. Suffice it to say that Bole joins the other three languages discussed here in arguing for a reconstruction of pluractional reduplication in West Chadic that worked from the end, rather than the beginning of the word.

5. CVC vs. CV Reduplication

All the languages examined here except Hausa have pluractional reduplicants of the form **CV**. Only Hausa reduplicates **CVC**, where the second **C** is a copy of the consonant that would generally begin the syllable following the reduplicant.¹⁶ Two factors suggest that Hausa is the innovator in selecting **CVC** reduplication as the only method for pluractional formation. First, reconstructing **CVC** pluractional reduplication as original would require that we claim that the other languages independently shifted to **CV** reduplication. For Bade and Miya, this might represent a single innovation at the level of their shared proto-West Chadic-B ancestor, but Bole is a West Chadic-A language, meaning that the same innovation would have to have taken place at least twice. Second, Hausa itself has internal evidence for **CV** reduplication as at least a former alternative to **CVC** reduplication. Newman (2000:520-521) describes a substantial number of frozen pluractional verbs in Hausa with **CV** reduplication based on both **C₁** and on **C₂**, e.g. **dādārā** ‘cut with something blunt’, **rārūmā** ‘grab, snatch’, **hārārā** ‘glare at’, **labābā** ‘sneak’.¹⁷

What, then, is the source of Hausa **CVC** reduplication? It turns out that outside the verbal system, **CVC** reduplication is common in all the languages. It is particularly common in descriptive words like ideophones and adjectives, but all the languages have nouns with **CVC** reduplication, and Bade has a substantial number of verbs with this type of reduplication.

(13)	BADE	<i>ideophone</i>	c̥d̥c̥d̥a	“biting”
		<i>adjective</i>	jabj̥àpa	‘small’

¹⁵ This verb (= **sìnk̥ìnu** in the Gadaka dialect) has a cognate in Hausa **sansànā**, itself a frozen pluractional, with no extant base ***sana**.

¹⁶ If the base for the reduplicant is a **CVC** syllable, the reduplicant is the syllable itself, not the **CVC** syllable plus the next consonant. For example, in **tàn-t̥ambay̥à** ‘ask’, the reduplicant can end in **-n-** < /m/. If the reduplicant were based on **tamb-**, the reduplicated form would not allow this pronunciation because the labial obstruent **-b-** would obligatorily undergo geminate assimilation to the next consonant.

¹⁷ Note that the vowel of the reduplicant is always long **-ā-** (Newman lists only one exception—**sādūdā** ‘give up’) and the root vowel of the verb is always short. Choice of the vowel **-a-** is reminiscent of the invariable **Ca** reduplicants of Bade and Miya, and the rhythmic contrast of short root vowel and long reduplicant vowel is reminiscent of vowels lengthened for apparent rhythmic purposes in the Bade verbs in (4b-c).

	<i>noun</i>	cəgjàkən	‘heel’
	<i>verb</i>	ḃəḃəru	‘break off adherent thing’
MIYA	<i>ideophone</i>	gatləgatlə	“burning”
	<i>adjective</i>	tsəntsəm	‘sour’
	<i>noun</i>	ádlámdlám	‘mud-dauber wasp’
BOLE	<i>ideophone</i>	nyimnyim	“in drops”
	<i>adjective</i>	bulbùl	‘yellow’
	<i>noun</i>	kùm kùm	‘small of back’
	<i>verb</i>	mùrmùsu	‘rub back and forth’
HAUSA	<i>ideophone</i>	tsantsan	“cautiously”
	<i>adjective</i>	kàk kàrfā	‘strong’
		(< kàrfi ‘strength’)	
	<i>noun</i>	bàlbēlā	‘cattle egret’
	<i>verb</i>	see (3)	

In Bole, a small number of verbs (fewer than five) from a currently available list of 600-700 verbs may come from **CVC** reduplication, though none show an exact copy of the base **CVC** or a copy that could be derived by productive phonological rules. Among languages examined here, Bade is the only one other than Hausa that has any verbs with clear **CVC** reduplication.¹⁸ It is not a productive process in Bade, however. None of the verbs with **CVC** reduplication have non-reduplicated counterparts, and in closely related Ngizim, verbs that are cognate with Bade **CVC** reduplicated verbs either are not reduplicated (Ngizim **kwàryu**, Bade **kùrkùru** ‘crow (the sound of a rooster)’) or have **CV** reduplication (Ngizim **gùgzu**, Bade **kùzgùzu** ‘teach, learn’, Ngizim **cècku** ‘filter, strain’, Bade **cèkcèku** ‘sift’).¹⁹

It appears that Hausa has extended the widely occurring **CVC** reduplicant pattern to domains where it was not originally used, one such domain being verb pluractional formation. Historically and even synchronically speaking, Chadic has two process that should be kept distinct: “repetition” and “reduplication”. REPETITION involves full repetition of a word, a process still common in all these languages to express various kinds of meanings depending on the type of word involved, e.g. in Hausa **maza-maza** ‘very quickly’ (< the adverb **maza** ‘quickly’), **fari-fari** ‘whitish’ (< the adjective **fari** ‘white’), **huđu-huđu** ‘four each, four at a time’ (< the number **huđu** ‘four’). REDUPLICATION involves building an affix by doubling part of a root. The **CV** pluractional reduplicants in the languages discussed in this paper other than Hausa are an example. True reduplication, like all inflectional and derivational morphology, is a lexically based process of word formation. Repetition, on the other hand, may more properly belong to syntax. Through the operation of regular phonological processes, however, repetition can participate in reduction and shift into reduplicative morphology. Thus, Hausa **maza-maza** ‘very quickly’ is typically reduced to **mařmaza** and **huđu-huđu** ‘four each, four at a time’ is

¹⁸ I refer only to base verbs. There are verbs like **jàgjàktu** ‘tremble’ derived from **CVC** reduplicated nouns (**ajàgjàkən** ‘trembling’) with the productive pan-Chadic verb-forming suffix **-t-**. Presumably other languages that have appropriate **CVC** reduplicated nouns and a verb-forming suffix could also derive such verbs.

¹⁹ It is probably significant that the cognate Ngizim verbs have **Cə-** reduplication rather than the normal **Ca-** for type (7b) reduplication as in **ḃàḃəru** ‘peel off’ < **ḃəru** ‘divide’ (cf. (4b) for Bade examples).

typically reduced to **hũhufu**, i.e. they become unit words with **CVC** prefixes. Once the **CVC** is understood as reduplicative affix rather than a word repetition, it becomes available for environments where repetition would not have been a standard pattern. One such environment is verb pluractional formation. I know of no Chadic languages that fully double verbs for this purpose,²⁰ i.e. pluractional formation is always a lexical process of word formation, not repetition.

Hausa has gone further with extending **CVC** reduplication than any other language that I am familiar with. In addition to verb pluractionals, Hausa has extended **CVC** reduplication to noun pluralization. In Hausa noun plurals that simply reduplicate a stem consonant, reduplication is always of the **CV** type, e.g. **tāgà** → **tāgōgī** ‘window(s)’, **wurī** → **wurārē** ‘place(s)’, **mūdù** → **mūddā** < ***mūdādā** ‘measuring bowl’. In plurals that combine reduplication with an added **-VCV** suffix, however, Hausa inserts a reduplicated syllable formed from the final root consonant plus the **-VC-** portion of the suffix, e.g. **jākā** → **ja-kun-k-unā** ‘bag(s)’, **dārī** → **dā-rur-r-ukā** ‘hundred(s)’, **kāyā** → **kā-yà-y-akī** ‘load(s)’. Other languages that have noun plurals combining reduplication with a suffix have only **CV** or **C** reduplication, e.g. Bade²¹ **gùrà-m-ən** → **gùrà-r-m-ən-ən** ‘dum palm(s)’, **asakón** → **asa-s-k-ənān** ‘stalk’; Miya **gwágúm** → **gwágú-ma-m-àw** ‘dove(s)’.

6. Vowel of the Reduplicant

Reduplicants in the four languages examined here have three kinds of vowels: Hausa and Bole prefixal reduplication copy the vowel of the base (Hausa **bub-bùgā** ‘beat’, Bole **du-duru** ‘jump’); Bade and Miya prefixal and infixal reduplication have an invariable vowel **-a-** (Bade **ḡà-ḡàru** ‘peel’, Miya **ba-bəta** ‘untie’); Bade final consonant reduplication and Bole infixation have the languages’ respective epenthetic vowels (Bade **gā-fə-fu** ‘catch’, Bole **’yò-gì-ru** ‘stop’). What vowel or vowels do we reconstruct for the original vocalism of pluractional reduplication?

For Hausa **CVC** reduplication, and also non-productive Bade **CVC** reduplication, we clearly must reconstruct the vowel of the base. The table in (13) shows that **CVC** reduplication in all the languages and in all its functions always copies the whole base including its vowel. For **CV** reduplication, however, the broadest array of evidence suggests that pluractional reduplication is like a true affix, with its vowel supplied lexically or by rule rather than being taken from the root to which it is added. The vowel in **CV** pluractional reduplicants is either **-a-** or an epenthetic vowel. This includes the frozen **CV** pluractionals of Hausa mentioned at the beginning of section 5 and in footnote 17. Likewise, in reduplication associated with noun plurals, the vowel of the reduplicated syllable is always supplied by the rule for plural formation, not copied from a root vowel.

These facts suggest that Bole prefixal reduplication in words like **’yo-’yoru** ‘stop repeatedly’, with a copy of the root vowel, is innovative. If this is the case, a likely path for the innovation is roots in which the vowel itself is **-a-**, such as **dà-dà’yu** ‘step on’. In such verbs, the vowel is ambiguous: it could be a copy of the root vowel or it could be an invariable **-a-**. Under the former interpretation, reduplication in a root like **’yoru** would be **’yo-’yoru**.

²⁰ I refer to verbs used in “finite” tense/aspect/mood (TAM) forms. Hausa and Bole, at least, can use repetition to form what Newman (2000:Chapter 29) refers to as “frequentatives”, e.g. Hausa **tàmbàye-tàmbàye** ‘repeated asking’, Bole **’yòrò-’yoro** ‘repeated stoppings’ (Gimba 2000:§10.1.1). Frequentatives can be used in verb-like settings, though not as main verbs in all TAMs.

²¹ In the dialect of Bade considered here, all nouns, singular and plural, are cited with an ending **-Vn**.

On the basis of current data no clear choice emerges between a fixed **-a-** and an epenthetic vowel as the reconstructable vowel for **CV** reduplication. Prefixal reduplication normal seems to have **-a-**, but the vowel of infixal reduplicants varies from language to language and from verb class to verb class. A definitive reconstruction must await further research

7. Afroasiatic Homologs to Pluractional Reduplication outside Chadic

This section will be brief and speculative, but it seems worthwhile to look for Afroasiatic evidence outside Chadic for the basic hypothesis of this paper, viz. that verbal pluractional formation in Chadic should be reconstructed as operating on non-initial rather than initial portions of verb roots. The main problem is identifying homologs to Chadic pluractional reduplication.

The non-Chadic Afroasiatic languages that I have some knowledge of—Berber and Semitic—do not have reduplicative pluractional formation of the Chadic type. They do, however, use consonant gemination, which seems akin to reduplication, and as we have seen in Bole, can even derive from reduction of a reduplicated syllable. I refer here to the so-called “present” of Akkadian, which also has habitual and continuative meaning, and the so-called “imperfect intensive” form of Berber languages, which likewise has continuative or habitual sense. To generalize terminology, I will call these “imperfective” and will contrast this with “perfective” forms (variously called “preterite”, or “perfect” depending on the descriptive tradition). Compare the perfective and imperfective forms in Akkadian (Buccellati 1997) and in Tamazhaq (Alojaly 1980) with the corresponding perfectives. The verbs are in the form for 3rd masculine singular subjects.

(14)		PERFECTIVE	IMPERFECTIVE	
	AKKADIAN	iprus	iparras	‘break’
	TAMAZHAQ	ikrAS	ikarrAS	‘build’
		ikna	ikannu	‘make’
		igAr	iggar	‘pierce’

For three consonant roots in both languages, it is the second (= penultimate) root consonant that is geminated in the imperfective, reminiscent of Bode polyconsonantal reduplicants and Bole frozen pluractionals of the type in (12b). Semitic has innovated by making all its verb roots triconsonantal (at least under the standard Semitic analytical system), but Berber, like Chadic, has many biconsonantal roots. The majority of biconsonantal roots fall into two basic classes: those that end in a vowel in most of their conjugational forms (**ikna** ‘make’ in the examples here) and those that end in a consonant, always with an internal vowel separating the two consonants (**igAr** ‘pierce’ in the examples here). Those ending in a vowel geminate the second (= final) consonant, but those ending in a consonant geminate the first (= penultimate) consonant. Again, this is reminiscent of the Bode situation and probably the broader reconstructable West Chadic situation. The point of interest is that for most verbs, it is the penultimate or final consonant that is geminated, and even for those biconsonantal Berber verbs that appear to geminate the first consonant, one can interpret this as penultimate gemination. Note that in Berber, triconsonantal **krs** ‘build’ and biconsonantal **gr** ‘pierce’ share the property of having no lexically specified vowels—internal vowels in such roots are all supplied as part of the particular morphological pattern. The specific final vowel of **knV** ‘make’ type roots is also part of the particular morphological pattern, but the presence of a final vowel is a lexical property.

This data begs the question of whether we are actually dealing with homologous morphological patterns between these languages and the Chadic languages. Pluractional reduplication in Chadic is a derivational process that creates verb stems indicating repeated

action, but these stems can be used in any TAM. The geminated Semitic and Berber forms in (14) are themselves part of the TAM system. There is, however, a clear semantic link between derivational pluractionality and inflectional durativity. Ekkehard Wolff, in a number of papers over the years, beginning with Wolff (1979), has proposed functional shifts in Chadic languages between derivational categories, such as pluractionality, and inflectional categories, such as durative/habitual. Plausible as such functional shifts seem, Wolff has not documented clear examples where such shifts have taken place, and my observations from West Chadic suggest that these languages have maintained a rather rigid division between their derivational and their inflectional categories. There are Chadic languages outside West Chadic that use reduplication to mark inflectional TAM categories, but more research will be necessary to ascertain whether or not this phenomenon can be historically linked to pluractional formation.

8. Conclusion

Working from an insight of Newman (1989) on the original direction of Hausa pluractional reduplication, this paper has sought to show that we can reconstruct proto-West Chadic pluractional reduplication as involving the final or penultimate consonant of a root, not prefixation based on the initial consonant of the root as superficial examination of certain languages might suggest. The paper examines pluractional formation in four languages which represent the genetic extremes of West Chadic. Once one makes some phonological adjustments and recognizes innovations deriving from natural reanalyses, we find that all these languages support the proposed reconstruction. Bade seems to represent the most conservative pattern. The Miya system is nearly identical to that of Bade, requiring little more than reduction of geminates with compensatory vowel lengthening to explain differences from Bade. The Bole picture is murkier because of the change of original reduplicative infixes to geminate consonants or infixes of invariable structure, plus the extension of reduplicative prefixes as the only productive means of pluractional formation. As in Hausa, however, frozen pluractionals confirm an earlier system where prefixation was not used with polyconsonantal roots. Frozen pluractionals are the key to the earlier picture in Hausa, but Hausa differs from the other languages in using **CVC** reduplication rather than **CV** reduplication. **CVC** reduplication in Hausa appears to be an extension of a pattern found in all the other language in word categories OTHER THAN VERBS. In a brief discussion of these Chadic languages in a broader Afroasiatic context, I suggest that non-initial reduplication is, and apparently always has been the norm.

Aside from its implications for Chadic and Afroasiatic morphological reconstruction, I hope this paper will make a more general contribution to the understanding of the nature and evolution of reduplicational morphology.

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