

METHODOLOGICAL ISSUES IN APPLYING LINGUISTICS TO THE STUDY OF PREHISTORY

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Abstract

This paper constitutes an essay in the theoretical and methodological issues involved in the application of comparative historical linguistics toward reconstruction of a fragment of a cognitive state of a people. One of our aims is to examine the consequences of choice of methodology to the study of a people's origin, movement, and intercultural contacts.

Our study, based on fifty names for animals in sixty-two Chadic languages, allowed us to divide these names into three groups: (1) Those names of animals that can be easily reconstructed and are well retained, (2) those names of animals that can be reconstructed but are poorly retained, and finally (3) those names of animals that cannot be reconstructed. We have found, as we expected, that on the basis of such a study we can establish that names of animals found in and around the human habitat have a slower rate of change than the names of animals not found in the human habitat. Thus we obtained a different division than the one usually found in historical works which divides animals into domestic and wild. We have also found that basic level words have a slower rate of replacement than non-basic level words.

Since animals from all three groups based on degree of retention were found to inhabit the same geographical area, we conclude that one cannot make claims about the origin of a human group on the basis of the reconstruction of the names of animals, at least not on the level of genus. One of the ways in which languages replace their vocabulary is through borrowing from other languages. Since our method allows us to know what names are replaced more frequently than others, a careful study of the poorly retained names may provide information about intercultural contacts over a period of time. We may expect that for two languages A and B that were in contact with each other, language A may retain an

old form of B and B may retain an old form of A, for those items that have been replaced. As the result of our study we have made explicit some of the implicit assumptions used in reconstructions of lexicon.

Aim and scope of the paper

Linguistic investigation has frequently been applied as a tool to the study of the prehistory of a people. In such studies, the original locus of a people is postulated on the basis of reconstruction of plant names, geographical names, and also names of animals. These particular data are useful because one can compare them with results from other disciplines, i.e., paleontology, archaeology, and zoology.

Our research was conducted on Chadic languages, which at 140 languages constitute the largest group within the Afroasiatic family. Our theoretical assumption is that if we can reconstruct the name of a given animal, then that animal was known to the speakers of the language. If we cannot reconstruct the name of the animal, then there are two possibilities: (1) The animal was known, but its name was frequently replaced. (2) The animal was not known. This latter hypothesis cannot be substantiated with any kind of positive data. Thus we cannot claim a reconstruction of the state of knowledge of speakers of Proto-Chadic with respect to the animals whose names cannot be reconstructed because we cannot prove positively that the speakers did not know them.

Data

Ideally for the study of history based on language data, one would like to have detailed information that would match a word in the target language with its zoological term. We have limited our investigation to animals, insects and reptiles, fifty in total, as listed in Kraft 1981. We had at our disposal words in the target languages which were obtained as answers to questions in English containing basic-level terms such as 'gazelle' rather than 'kind of gazelle', or 'monkey' rather than 'a particular species of monkey'. It is not always certain that in a work resulting from rudimentary field elicitation a given term refers to the animal in question. We can only hope that the answers in the target languages were the corresponding basic-level words. While there is little doubt concerning the identification of the terms glossed 'dog' or 'cat', there are considerable doubts as to whether terms glossed as 'wild cat', 'gazelle', 'duiker', 'louse', and 'kite' have the same basic-level terms

in all the languages under investigation. For instance, identification of various kinds of antelopes by both native speakers and linguists collecting the data may vary considerably as can be detected in Skinner 1984. In the data we have used, pàp is 'duiker' in Ankwe and Cip, but 'gazelle' in Sura. Nevertheless we have used Kraft 1981 because it is easily accessible for the largest number of animals in the largest number of languages in a uniform transcription of any source to date. Sixty-six languages, some closely related, from three branches of Chadic are represented in our sample. Occasionally we used other sources as listed, especially for the East branch. The following is a list of the words which we have examined, namely items #158 through #207 in Kraft's Chadic Wordlists, Vol's.1-3:

wild animal	lion	hyena	elephant	leopard
monkey	baboon	gazelle	duiker	rabbit
guinea fowl	rat	wild cat	lizard	snake
python	turtle	frog	squirrel	bat
scorpion	chameleon	worm	fly	mosquito
spider	louse	termite	anthill	locust
cow	bull	goat	he-goat	sheep
ram	horse	donkey	hen	rooster
dog	cat	bird	dove	kite
vulture	wing	egg	horn	tail

(Kraft states that the transcriptions contained in these volumes are 'at best...semi-phonemic.' We have taken the transcriptions to be broad phonetic.)

Methodology

The determination whether or not the items are cognate was made on the basis of known sound correspondences as listed in Newman and Ma 1966 and in Newman 1977. In addition we checked whether the cognate items conform with the sound correspondences that we were able to establish in the course of our own research.

Chadic languages are divided into four branches in Newman's 1977 classification (West, Biu-Manadara, East, and Masa) and three in Jungraithmayr's 1978 classification (West, East, and Central). If a cognate occurred in three or two branches, as in Newman's 1977 classification, the item was considered to be present in P.C. The justification for this approach is the following: There is no indication that any of the branches are more closely

related than others, therefore the existence of cognates in two branches cannot be considered a retention from the time when the two branches split from the other two or one branch, nor can that item be considered a product of common innovation. If an item can be reconstructed for two branches of a family, then that item can be reconstructed for the family as a whole. Due to the fact that there are at most four but most likely three branches of Chadic, the above principle should be useful in this particular investigation. There is the possibility that languages from two or more branches have borrowed the same item from a neighboring non-Chadic language. Such a possibility is especially real when the number of Chadic languages that show cognates is very small. Thus, a representation by only one language in at least two branches (e.g. one language in the West Branch and one language in the East branch) was not considered to be evidence of retention because, more likely than not, those were independent borrowings. Such is the case with reflexes of *p-r-s for 'horse', ultimately a borrowing from Arabic.

Items were considered cognates when they had at least two identical consonants or consonants that differed predictably as per known sound correspondences. The differences in vowels did not play a large role in our reconstructions, but in most of the reconstructed items vowels shared at least one distinctive feature such as high or low or [+] or [-] [round]. We did not take tones into consideration because we decided that having two or three identical segments was enough to establish the elements as cognates. And although tone is a distinctive element in all Chadic languages, and one can easily find two lexical items with identical segments that would differ only in tone, the likelihood of these two items being in the same semantic field (e.g. a corpus of animal names) is very slight.

A particularly difficult issue in reconstruction is when, for a given item, there are more than one set of cognates, i.e., there are competing forms, distributed more or less equally over two or three branches. When such a case occurs, we assume that more than one species was originally involved, and that the two names used to refer to different species. A case in point is the entry 'louse', for which one can reconstruct two forms: (1) *jankat and (2) *tant. We assume that different species are involved: (1) the head louse and (2) the pubic louse. The evidence for such an interpretation is provided by the fact that in Kera (East) cognates for both terms have been recorded, e.g, the cognate of the *tant form (tente) was glossed specifically as 'pubic louse' rather than 'louse'.

Reconstructions

In the following list for each item we give our reconstruction, percentage of retention, Newman's 1977 reconstruction, and Skinner's 1977 reconstruction, if any. We also quote forms reconstructed in Jungraithmayr and Shimizu 1981, although one should remember that in their work, several forms may be reconstructed for the same lexical item. We have chosen the form that resembles most our own reconstruction, and when no such forms were available, we have chosen the form most frequently represented by individual languages. The form of our reconstructions may differ from reconstructions by Newman, Skinner, and Jungraithmayr and Shimizu. We do not intend to argue in this paper for the advantages of one reconstruction over another. Our main aim here is simply to show that such reconstruction is possible.

<u>%</u>	<u>#</u>	<u>Gloss</u>	<u>F&R</u>	<u>Newman</u>	<u>Skinner</u>	<u>J & S</u>
9.4	6/64	chameleon	n-gar	0	0	0
9.5	6/63	bull	b-j-m	0	kum	0
11.1	7/63	"	k(w)/(m)	0	0	0
12.5	8/64	locust	bata	0	0	0
15.6	10/64	spider	(n)-t-t	0	0	0
14	9/64	"	z-m-b	0	0	0
15.9	10/63	baboon	b-k-m	0	0	0
17.2	11/64	"	bil	0	0	0
18.5	12/65	hyena	m-b-l	0	0	ml-
6.3	4/63	"	n-d-u	0	0	0
18.8	12/64	he-goat	but	0	0	0
21.9	14/64	termite	t-t-r	gəhla	0	0
23.8	15/63	hen	tika	0	0	0
25.4	16/63	"	k(V)	0	0	0
25.4	16/63	python	mudutu	məðə	0	0
28.1	18/64	mosquito	vut	0	0	-bd(s) (m-,k-)
28.5	18/63	rat	kusum	kusəm	0	ksm
29.7	19/64	snake	w V[+back]	0	0	kk
30.8	20/65	tail	k-t-r	kətər	0	kt-
32.8	22/67	horse	dok	0	d-w	dwk
41.8	28/67		if k-d is considered cognate			
33.3	22/66	bird	ɖ-k	ɖəy-	0	yɖ(-t,-k)

33.9	21/62	kite	kiwl	0	0	0
34.4	22/64	wing	p-k	p-k	0	0
34.8	23/66	fly	didi	diwa	0	kdb
35.9	23/64	frog	kwab/d	0	0	0
36	24/64	dog	k-d-n	kər-	k-d-r / ()s	kd(n)
39	25/64	cat	patu	0	0	pt(a)(-u)
39.1	25/64	rabbit	vid-	0	0	bnd
40.6	26/64	vulture	kutik	0	0	0
41.3	26/63	wild animal	lu	0	L/TL_w	0
41.5	27/65	rooster	guluk	0	0	0
42.9	27/63	louse	jankr	0	0	dfynkt
43.8	28/64	lizard	kwada	0	0	0
44.6	29/63	monkey	bidi	bədi	0	bd(i)
46.2	30/65	turtle	kul	0	0	kr (tortoise)
47.7	31/65	elephant	g-w-n	gyəwan	0	gywn(-k)
48.4	31/64	egg	†i	aši	-š-	-†
49.3	32/65	ram	gam	gam	G-m-l	gm(a)
49.3	32/65	sheep	t-m-ki	təmki	D-m	tmk
51	33/64	goat	(u)ku	a(wku)	0	-kw-(-t,-k,-n)
54.7	35/64	cow	†a	hla	(g-)tlaŋ	†(a)
58	37/64	donkey	koro/a	0	j/dz-(nk)-	0
62.5	40/64	guinea fowl	z-b-n	zaban	z-b-r	zbl(-k)
64.6	42/65	scorpion	(n)d-r	(x)ərda	0	0

Comments on individual items

kite 33.9 21/62 *kiwl 0 0 0

We reconstruct *kiwl for kite for the following reasons: /k/ becomes [š] before a high front vowel in Hausa I.A.1, Ngamo I.A.2, Pidlimci I.B.2, Ga?bin, Ga?anda, and Hwona II.A.1. /i/ becomes /u/ before /w/ in Ngamo and in Hwona and Ga?bin. /wr/ metathesis is independently attested for Hausa, and that explains the form shirwaa.

frog *kwab/d 35.9 23/64 0 0 0

The languages which have not retained the form have replaced it with other forms which do not appear to have one source.

mosquito	*vut	28.1	18/64	0	0	-bd(s) (m-,k-)
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In the Angas group, this item has a prefix n-, and in the Masa group, it has a suffix -na.

vulture	*kutik	40.6	26/64	0	0	0
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Reflexes of this form are found in Dwoṭ I.B.2 as kudak, and through the entire Central Branch. The form has been frequently replaced in the West and East Branches. There is no apparent source.

rabbit	*vid-	39.1	25/64	0	0	bnd
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A reflex of *vid- is found in Ngizim I.B.1. In II.A.2-4 many languages have retained reflexes of the *vid- form. We assume that the forms containing pita and pitu (Bura, Kilba, and Margi, II.A.2) are also reflexes of *vid-. Reflexes of *vid- are also found in the Masa group, where the initial /v/ became voiceless, a process attested in other lexical items.

lizard	*kwada	43.75	28/64	0	0	0
	or *bil	17.19	11/64	0	0	0

Reflexes of the form *k-d are attested in I.A.2 (e.g., Pero ankada), possibly in II.A.3 (e.g., Higi xàdigàla), and possibly also in Masa (e.g., Lame kukura.) Reflexes of the form *bil- are attested in languages from I.B.1-2 (e.g., Buli mbàlim and Pelci tàpilèn.) In II.A.2, the form was replaced by a form containing *t-w-l.

scorpion	*(n)d-r	64.61	42/65	(x)ərda	0	0
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The xi- sequence found in II.A.1 is probably a prefix rather than an integral part of the lexical item. The evidence that xi- is a prefix is provided by the fact that this sequence was observed on several other animal names in the same languages. The reflexes of *n-d-r can be found in I.A.2, I.B.2, and II.A.1 (ṅurdàra in Hwona).

wing	p-k	34.38	22/64	p-k	0	0
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We accept Newman's reconstruction. Although the form is frequently attested in the Western and Central Branches, it has not been retained at all in the East Branch or Masa.

squirrel	*
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We also would like to reconstruct the word for 'squirrel'. Such a reconstruction is possible only if we assume that there is a correspondence between sequences kay and ayk. In the

West Branch we have ayik in Kanakuru I.A.2, heyak in Ankwe I.A.2. and hayko in Ngamo I.A.2. In Bade I.B.1 we find kayan, and in the Higi group II.A.3, we find mukəy. Possibly the Lama form hiyi in the Masa group is also a reflex of kay. Nevertheless, the form was replaced in many languages.

python	*mudutu	25.4	16/63	məfə	0	0
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We propose *mudutu, while Newman proposes *məfə. The argument in favor of our reconstruction is that one language from the Masa group shows mudura, and another has muduta. In addition, in group II.A.8, in Bacama, there is a form miyɔ̀tò̀. We believe that it is more likely that the third syllable was lost in West Chadic rather than added in two branches, namely Masa and the Central Branch. Consistently throughout group II.A.2, the original form was replaced by a compound consisting of the lexemes 'elephant' + 'snake', e.g., pabu ciwar in Margi.

hyena	*m-b-l	18.5	12/65	0	0	ml-
	or *n-d-u	6.35	4/63	0	0	0

Reflexes of the form *m-b-l are retained in II.A.2. and II.A.8 (e.g., Bacama mburuməy and Cibak mwapul) and in I.B.2 (e.g., Dira mumali.) The other form, *(i)ndu, has reflexes in all languages of the Masa group, and also in Mandara II.A.4, ?indàlè. We consider the initial vowel [i-] to be epenthetic (Frajzyngier and Koops 1989). The nasal prefix appears frequently in entries for 'hyena' in many languages, e.g., Pelci I.B.2 ngùwi, Masa IV ɲurnaita, Cibak II.A.2 mwapul and in Sura I.A.2 ndùmu. Since the presence of the initial nasal is often a result of borrowing as described in Frajzyngier and Koops 1989, it is very likely that one should not reconstruct either of the above forms and consequently no form could be postulated as representing the Proto-Chadic form for 'hyena'.

he-goat	*but	18.8	12/64	0	0	0
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We reconstruct *but for goat because there is a form but in Kanakuru I.A.2, fuš in Buli I.B.2, bura in Hildi and Kilba II.A.2, Fali Kiria II.A.3, and bwarV in Mwulyen and Gudu II.A.8. Quite likely the form kupurki in Kera III could be analyzed as ku-pur-ki. Many languages show the same word for 'he-goat' and 'goat'.

chameleon	*n-gar	9.4	6/64	0	0	0
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This form has reflexes in West Chadic Angas ngaràp, Ngamo ?àngàngà, I.A.2, in the Masa group, Banana gàlirà and ngalingalira, and possibly in Kera III àmə̀ə̀ə̀li. 'Chameleon' remains a very doubtful candidate for reconstruction.

spider	*(n)-t-t	15.63	10/64	0	0	0
or	*z-m-b	14.06	9/64	0	0	0

There is a very high rate of replacement of both forms. In the Angas group, the word for spider, naan or neen, seems to be cognate with the words for 'god, respectable person, adult', etc.

termite	*t-t-r	21.88	14/64	gəhla	0	0
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Reflexes of *t-t-r occur in groups I, II, and IV. E.g., in Ngamo I.A.2 we find tatara, in Glavda II.A.4 tirara, Zagvana II.A.8 turara, and in Misme IV tar. /t/ to /r/ change, or rhotacization, is well attested on independent grounds. The form *t-t-r was replaced in a number of languages; thus in I.A.2, we find forms n-zia, and in II.A.1-2 replaced by forms k-l and l-m. Newman's reconstruction *gəhla, is also plausible because sequences of [velar] and [liquid] occur in all three branches.

baboon	*b-k-m	15.87	10/63	0	0	0
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Reflexes of this form can be found in the Masa group and in the Central group languages Gudu and Mwulyen. In I.A.1 and 2, Bade and Ngizim, there is a nasal prefix that seems to have moved to the second syllable, as in bangə̀i. There is a consistent source for languages II.A.1-2, which is bilam. Likewise, there is another source for languages II.A.3-8, luk, as in lukuvà.

bull	*b-j-m	9.52	6/63	0	0	0
or	*k(w)/(m)	11.11	7/63	0	0	0

Reflexes of *b-j-m are found in I.A.2 and I.B.2, with possible cognates in Masa (buljuva, buhljuvna). Reflexes of the form *kwm are found in Bade I.B.1 and Gava and Gelevda II.A.4. In a number of languages the term for 'bull' is the same as that for 'cow', namely ɬa. The low retention for this item may indicate one of two things. (1) that proto-Chadic people were not pastoralists, and not being involved in cattle breeding they did not have much use for bulls. This explanation, however, is not very valid in view of the fact that the word for 'cow' is one of the best retained words. A similar situation obtains for the pair 'goat' and 'he goat'. The first has a very high degree of retention while the second has a

very low degree of retention. We would like to postulate the following linguistic explanation, which ultimately may be a result of some cultural factors. We would like to postulate that for the pairs 'cow/bull', and 'goat/he-goat', the first elements are basic-level terms, while the latter ones are not basic-level terms. The non-basic-level terms are learned later, are less used, and as our data indicate are subject to more frequent replacement (cf. Lakoff 1987).

There is a remote possibility that in a pastoralist society 'bull' has a special role in the social system. Thus in some contemporary pastoralist societies in East Africa each bull has a personal name. If that were also the case with speakers of Proto-Chadic, low retention of a generic term could be attributed to the naming system that assigns an individual name to each bull.

locust	*bata	12.5	8/64	0	0	0
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Reflexes of *bata are attested in Hausa I.A.1 faàraa, in Ngamo I.A.2 ndə̀bùro. In II.A.1, the form has a nasal prefix (e.g., mbetə̀ in Boka.) The reflex *bara is found in Banana IV. The original form, however, was frequently replaced. Note the occurrence of hawa and similar forms throughout II.A.

hen	*tika	23.80	15/63	0	0	0
or	*k(V)	25.40	16/63	0	0	0

Reflexes of the form *k(V) display all vowels: /i/ in Hausa, /e/ in Ankwe, /o/ in CIP, and /u/ in Burma kuk. Reflexes of the form *tika occur in the Central Branch and in Masa. In some languages of the II.A.2 group, reflexes of *tika have a nasal prefix. There is a high rate of replacement in all branches. It appears that in two languages of II.A.3, the two candidate forms have merged, e.g., Higi Nkafa kwantikwa.

gazelle and duiker

In Kraft 1981, lists for gazelle and duiker contain many cognate words, e.g. paap 'gazelle' in Sura and pap 'duiker' in Cip, Ankwe, and Angas; gəkəl 'gazelle' in Ankwe and jikil 'duiker' in many languages from the Bura group. There are two possibilities here. One is that the presence of the cognate words for two different animals is an artifact of data collecting method. The other is that indeed, there was no distinction made between the two species among the speakers of various languages. If the latter is the case, we would like to propose *K-G as the reconstructed form for duiker/gazelle. Reflexes of the forms *G-K occur in West Chadic for 'gazelle' and the forms jikəl occur in the Central branch for 'duiker'.

What cannot be reconstructed

We cannot reconstruct 'wildcat', 'lion', 'leopard', 'worm', 'horn', 'bat', and 'anthill.' As stated earlier, if a word cannot be reconstructed, theoretically there are at least two possibilities: The term was not known, or the term was known but, for one reason or another, it was replaced. The first possibility seems to us to be highly unlikely because the referents of the items that we cannot reconstruct are well known all over Africa and there is no evidence that they were newly introduced into the continent. Moreover, a wider comparative study, involving in our case the whole Afroasiatic family, may well indicate that the animals were actually known to the speakers of Proto-Chadic. In order to check the hypothesis that we cannot reconstruct the name of an animal because it did not inhabit the same ecological niche as man, we compared the distribution of animals whose names we cannot reconstruct with the distribution of animals whose names we can reconstruct. If the two distributions were to be different, then that would indicate that indeed, we cannot reconstruct a name because the animal simply was not known. But, if the distributions were to be the same, then lack of knowledge cannot be taken as the reason for which we cannot reconstruct a name. The distribution of 'elephant', which we can reconstruct with certainty, is virtually the same as the distribution of 'lion' and 'leopard', which we cannot reconstruct. Therefore, we have to consider the reasons for which these terms were so frequently replaced that they cannot be reconstructed now. One of those reasons may be a result of cultural taboo. In some Chadic cultures, for example, 'leopard' is thought of as being the incarnation of spirits of deceased male ancestors. A. Coupez informs us that most of the items that we cannot reconstruct are taboo words in Rwanda. It is also quite possible that some terms were culturally insignificant, i.e. they were not a source of food, danger, disease, object of a religious cult, that they did not occur frequently in daily speech, and therefore were subject to frequent replacement.

In the following chart we have taken the fifteen least retained items and the fifteen most retained items. We then examined whether low or high retention correlates with four categories that we think may affect the retention. On this chart, values are assigned to each item regarding (1) its value as a food item, (2) how much of a 'nuisance' it represents, e.g., whether it bites, destroys crops, or otherwise represents a threat to one's well-being, and (3) its mere presence within the human environment.

The values that we assign to each category are arbitrary. If a species is a regular source of food we assign it the value 3. If it is not a regular source of food, but still frequent

enough, we assign the value 2. If it is a rare source of food we assign it the value 1. There are animals that are eaten but so rarely that they cannot be considered a source of food. For example, an occasional lion is killed and eaten, but it happens so rarely that we would assign 'lion' the value 0 in the category food. A similar approach is taken with the category 'nuisance'. A wild cat is capable of inflicting severe harm on humans but that does not happen frequently, therefore we assign it the value 0. On the other hand lice are considered to be a great nuisance and we assign them the value 3. The term 'human habitat' indicates that the species shares the same narrow (not geographic) habitat as man, viz. that it can be found in or around the house. Our term does not overlap with the term 'domestic' which describes only those animals that are tame, or are useful for man in his daily life. Species living in and around the compound are not necessarily limited to domesticated animals. Spiders inhabit the same niche as man, and therefore we give 'spider' the value 3, the same as we give 'cow'.

<u>%</u>	<u>Gloss</u>	<u>Food</u>	<u>Nuisance</u>	<u>Hum. Habitat</u>	<u>Sum</u>
	worm	0	0	2	2
	bat	0	0	1	1
	lion	0	0	0	0
	anthill	0	0	1	1
	leopard	0	0	0	0
	wild cat	0	0	0	0
	hyena	0	0	0	0
9.4	chameleon	0	0	0	0
9.5	bull a.	1	0	3	4
11.1	bull b.				
12.5	locust	1	3	3	7
15.6	spider a.	0	0	3	3
14.1	spider b.				
15.9	baboon	0	0	0	0
18.8	he-goat	2	0	3	5
21.9	termite ed.	2	0	3	5
	non-edible	0	3	3	6
23.8	hen	3	0	3	6

41.5	rooster	2	0	3	5
41.8	horse	0	0	3	3

42.9	louse	0	3	3	6
43.8	lizard	0	0	3	3
17.2					
44.6	monkey	1	0	1	2
46.2	turtle	2	0	1	3
47.7	elephant	0	1	0	1
48.4	egg	3	0	3	6
49.3	ram	3	0	3	6
49.3	sheep	3	0	3	6
51	goat	3	0	3	6
54.7	cow	3	0	3	6
58	donkey	3	0	3	6
62.5	guinea fowl	3	0	3	6
64.6	scorpion	0	3	3	6

Discussion

As the chart indicates, occurrence within the human habitat, whether or not the animal is a domesticated one, indeed, is the most important factor in the retention of a lexical item. The high value in this category guarantees a retention. The next most important category is food. Items that have high values in this category are replaced less frequently than items that have low values in this category. Our category 'nuisance' proved to be of insignificant value for the retention ratio.

Implications for historical methodology

There are two methods of conducting a linguistic reconstruction. One consists of examining the data within a small subgroup, reconstruct the results, and then compare products of various reconstruction. The other, global approach is to look at synchronic data from various languages of the family and try to reconstruct a form on the basis of cognates, even if these are very few, but distributed among languages from different branches. The two methods may yield entirely different results. Thus in case of the data at hand, we were unable to reconstruct a number of words for Proto-Chadic. But a global approach to data in the Afroasiatic family may uncover cognates in individual languages of

other branches, such as Semitic, Cushitic, Omotic, Berber. Thus we may be able to reconstruct a word for the whole family without being able to reconstruct it for individual branches. There is also a possibility that the results of reconstruction for the whole family will differ significantly from the results of reconstruction for individual branches. In such a case, the reconstruction for the whole family represents a retention while the differing reconstructions for individual branches represent an innovation. Our approach essentially eliminates products of reconstruction in individual branches as valid data for the reconstruction of the whole family.

When one attempts to reconstruct a word that is frequently replaced one encounters such a variation of forms in the data that a reconstruction within the branch or a subgroup is not possible. Consequently a comparison of reconstructed forms for the whole family will yield the conclusion that the speakers of the proto-language did not know the word. Thus, the whole exercise will be useless from the point of view of linguistics and history.

The global approach should have the following form. One collects the data from languages from all branches of the family and instead of conducting a reconstruction within one branch and then comparing the results with reconstruction from other branches, one will compare words from all branches and all languages at the same time. We assume that borrowings will be filtered out through the usual methods. If one finds that among the remaining words there are cognates in several languages from different branches of the family, then the possibility that these words represent a retention is very good. This possibility is especially good if languages from different branches are not in geographical contact; a recent borrowing is virtually ruled out. This is the case with the Chadic branch, whose languages are not in contact with languages of any other Afroasiatic branch, save for the contacts with Arabic. The indirect borrowings and contacts can be traced and identified.

When we have the results of our global reconstruction, we can assume that all the other forms for a given lexeme that are not cognate with the reconstructed form represent one of two possibilities: An item will represent a descriptive word, similar to Slavic 'medved' (a honey eater) for 'bear', or the item is borrowed. What remains to be done with the non-descriptive words is to compare the words in languages that innovated with data in other languages of the area, not necessarily languages of immediate neighbors. An example of such a study is Frajzyngier and Koops 1989 where it is shown that animal names with the prefix *n-* occurring in many Chadic languages represent borrowings from languages of Niger-Congo and Nilo-Saharan families.

In their 1989 paper, Frajzyngier and Koops were speculating about the possible reasons for the existence of the many names of animals having a nasal prefix. The

explanation proposed was that these n- names were borrowed from surrounding languages as Chadic speakers came into contact with new species of animals (and plants) for which they had no name. The strong indication of borrowing led to the speculation that perhaps a study of the names of animals could provide us with information about the migration of Chadic speaking people. In light of the present study, we believe we should reject this explanation. If we look at the names that most often occur with the prefix n- in the West Chadic languages, we will see that most of them belong to the group with low retention, and that these are the words that are most unstable. Since those words would most likely have been replaced anyhow, we believe that the study of these words does not contribute toward the elucidation of the question of the origin of Chadic people, but what they do indicate is that these words were replaced relatively recently.

A study of those words that are frequently replaced should provide the information about the past contacts between different languages and consequently between different peoples.

Footnotes

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Samples of data

In the present sample we include four items: 'scorpion' whose proto-form is retained by a large number of languages, and 'leopard' whose proto-Chadic form we cannot reconstruct. We also include 'cow' a basic level word whose proto-form is retained by many languages, and 'bull', a non-basic level word whose proto-form is poorly retained. For comparative purposes we also include data from a few non-Chadic languages as given in Kraft 1981.

SCORPION

kùnaamàa	I.A.1	HAUSA
gòr	I.A.2	ANGAS
biyòr	I.A.2	ANKWE
ɗàkər	I.A.2	CIP
ɗiŋgìlin	I.A.2	KANAKURU (DERA)
ʔyendèrì	I.A.2	KAREKARE
fandenɔ̀rà	I.A.2	PERO
ɗəyir	I.A.2	SURA
fòwintiri	I.A.2	TANGALE
atìlise	I.A.2.	BOLE (WA)
məndùrsà	I.A.2.	GERA
ʔindiri	I.A.2.	NGAMO
wùrjən	I.B.1	BADE
wurjì	I.B.1	NGIZIM
indir	I.B.2	BULI
ɓindir	I.B.2	BURMA
ʔinduri	I.B.2	DIRA
njimàm	I.B.2	DWOT
yendil	I.B.2	GEJI
əkkitirù	I.B.2	MIYA
yindì	I.B.2	PəLCI
nyònjon	I.B.2	SEYA (WA)
xirdətə	II.A.1	BOKA
xirdətə	II.A.1	GA'BIN
hirdəta	II.A.1	GA?ANDA (MOKAR)
ɲurdārā	II.A.1	HWONA
ɗiŋliŋdi	II.A.1	PIDIMDI
xidì / xidukùr	II.A.2	BURA
yidə	II.A.2	CIBAK
idyəw	II.A.2	HILDI
idà	II.A.2	KILBA
idu	II.A.2	MARGI

idà	II.A.2	NGWAXI
idyèw	II.A.2	WAMDIU
yidà / yidè	II.A.2	WEST MARGI (PUTE)
yìti / kwəsay?in	II.A.3	FALI GILI
tì	II.A.3	FALI KIRIA
wtò	II.A.3	HIGI BAZA
kwə?isa / ptù	II.A.3	HIGI FUTU
pti / wti	II.A.3	HIGI GHYE
=itè	II.A.3	HIGI KAMALE (Kapsiki)
tè	II.A.3	HIGI NKAFA
fīdzìn	II.A.4	FALI BWAGIRA
fīdzùkū	II.A.4	FALI JILBU
fījì	II.A.4	FALI MUCELLA
fīnzà	II.A.4	GAVA
?ārdzà	II.A.4	GELEVDA
fīrdza	II.A.4	MANDARA
piše	II.A.4	NAKATSA
vārèdza	II.A.5	MATAKAM
irdi	II.A.7	DABA
gidīnǝto	II.A.8	BACAMA
ārdīdin	II.A.8	GUDE
gurīnja	II.A.8	GUDU
kyénkyen àtí	II.A.8	MWULYEN
kèngenàci	II.A.8	NJANYE
ranzà	II.A.8	ZAGVANA
hudùdà	IV	BANANA
huurura	IV	BANANA (MOUSEYE)
dí?wà	IV	LAME
jidfwa	IV	LAME (PEVE)
ndāwa	IV	MISME (ZIME)
huduta	IV	MASA
Non-Chadic		
gyèŋ		BANKALA
gyaŋ		JAKU

inyèn
ndàngù

JARI
YINGILUM

LEOPARD

For this item we have included words that appear to be similar in some of the languages of the area.

dàamisàa	I.A.1	HAUSA
mùlut	I.A.2	ANGAS
kuŋ	I.A.2	ANKWE
lišim	I.A.2	CIP
guŋgù	I.A.2	KANAKURU (<u>agu</u> Igbo)
màyiwà mò?awàyi	I.A.2	KAREKARE
cəŋgini	I.A.2	PERO (<u>cirgu</u> -Fulani)
lùšim	I.A.2	SURA
đàngo	I.A.2	TANGALE (teungu -Ful., <u>dam</u> Bua)
0	I.A.2.	BOLE (WA)
juŋgùmà	I.A.2.	GERA
gùŋgù	I.A.2.	NGAMO (<u>agu</u> Igbo)
ùuràkən	I.B.1	BADE
wùrək	I.B.1	NGIZIM
kwøk	I.B.2	BULI (kaga- Bagirmi)
pakìr	I.B.2	BURMA
?irimì	I.B.2	DIRA
?irum	I.B.2	DWOT
kwàki	I.B.2	GEJI
dèrwili	I.B.2	MIYA
yirim	I.B.2	PəLCI (<u>yiri</u> -Maba)
zi	I.B.2	SEYA (WA)
pêktə	II.A.1	BOKA
kìliwète	II.A.1	GA'BIN
(n)gìliwita	II.A.1	GA?ANDA (MOKAR)

piyarā	II.A.1	HWONA
wuŋɖidati	II.A.1	PIDIMDI
tuŋuwà	II.A.2	BURA
wùlà	II.A.2	CIBAK
?ufwa ciðəw	II.A.2	HILDI
màpéla?ù	II.A.2	KILBA
màmpilawù	II.A.2	MARGI
wulà	II.A.2	NGWAXI
wula	II.A.2	WAMDIU
wulà / birbəjəŋ	II.A.2	WEST MARGI (PUTE)
dùɣwàva	II.A.3	FALI GILI
puku	II.A.3	FALI KIRIA
pikø	II.A.3	HIGI BAZA (<u>ekpe</u> -Efik)
dùɣwəva	II.A.3	HIGI FUTU
tùkùvwa	II.A.3	HIGI GHYE
dùwàva	II.A.3	HIGI KAMALE
pìke	II.A.3	HIGI NKafa
dùgùvwən	II.A.4	FALI BWAGIRA
dùgùvwà	II.A.4	FALI JILBU
dùgùvwa	II.A.4	FALI MUCELLA
mbùlà	II.A.4	GAVA
?ubulà	II.A.4	GELEVDA
?ubulà	II.A.4	MANDARA
indàle	II.A.4	NAKATSA
jəŋgwaya / kwokwoya	II.A.5	MATAKAM
mùvulum	II.A.7	DABA
zàra	II.A.8	BACAMA (<u>zazərma</u> Kanuri)
bəya	II.A.8	GUDE
ɖiva:	II.A.8	GUDU
bəjɔ	II.A.8	MWULYEN
boṅya	II.A.8	NJANYE
buŋgwe	II.A.8	ZAGVANA
sidiina	IV	BANANA
dufuruka	IV	BANANA (MOUSEYE)
tirdir	IV	LAME

təndər	IV	LAME (PEVE) (<u>dondoru</u> -Fulani)
tindjir	IV	MISME (ZIME)
sildikna	IV	MASA

Non-Chadic

mbit		BANKALA
nyim		JAKU
ikwì		JARI
bàràùgà		YINGILUM

COW

saaniyaa	I.A.1	HAUSA
nəŋ	I.A.2	ANGAS
nəŋ	I.A.2	ANKWE
rəndonɔŋ	I.A.2	CIP
lā	I.A.2	KANAKURU (DERA)
kwām	I.A.2	KAREKARE
tangà	I.A.2	PERO
rindonɔŋ	I.A.2	SURA
tanɔgà	I.A.2	TANGALE
pəmì	I.A.2.	BOLE (WA)
ndiya	I.A.2.	GERA
kø̃m	I.A.2.	NGAMO
əktlān	I.B.1	BADE
l̥a	I.B.1	NGIZIM
l̥a	I.B.2	BULI
nāk	I.B.2	BURMA
la	I.B.2	DIRA
l̥a	I.B.2	DWOT
l̥a	I.B.2	GEJI
yirù	I.B.2	MIYA
l̥a	I.B.2	PəLCI
gal	I.B.2	SEYA (WA)

lotè	II.A.1	BOKA
lâta	II.A.1	GA'BIN
nulata	II.A.1	GA?ANDA (MOKAR)
lara	II.A.1	HWONA
ša	II.A.1	PIDIMDI
lâ	II.A.2	BURA
lâ	II.A.2	CIBAK
la	II.A.2	HILDI
lâ	II.A.2	KILBA
lâ	II.A.2	MARGI
lâ	II.A.2	NGWAXI
la	II.A.2	WAMDIU
lâ /læmwələ	II.A.2	WEST MARGI (PUTE)
la	II.A.3	FALI GILI
la	II.A.3	FALI KIRIA
la	II.A.3	HIGI BAZA
la	II.A.3	HIGI FUTU
la	II.A.3	HIGI GHYE
la	II.A.3	HIGI KAMALE
la	II.A.3	HIGI NKAFI
šan	II.A.4	FALI BWAGIRA
šan	II.A.4	FALI JILBU
ša	II.A.4	FALI MUCELLA
lâ	II.A.4	GAVA
la /laxa	II.A.4	GELEVDA
ʔula	II.A.4	MANDARA
la	II.A.4	NAKATSA
še	II.A.5	MATAKAM
ša	II.A.7	DABA
nâkuto	II.A.8	BACAMA
la	II.A.8	GUDE
lâksü	II.A.8	GUDU
nâkütî	II.A.8	MWULYEN
nâkwòci	II.A.8	NJANYE
lâ	II.A.8	ZAGVANA

buła	IV	BANANA
buhla	IV	BANANA (MOUSEYE)
náò	IV	LAME
nao	IV	LAME (PEVE)
naou	IV	MISME (ZIME)
puta	IV	MASA

Non-Chadic

ndək		BANKALA
ndəxa		JAKU
nyək		JARI
náyò		YINGILUM

BULL

sāa	I.A.1	HAUSA
nkwòs-nəŋ	I.A.2	ANGAS
nəŋgəməs	I.A.2	ANKWE
0	I.A.2	CIP
mami lā	I.A.2	KANAKURU (DERA)
muzimà kwàm	I.A.2	KAREKARE
tangà	I.A.2	PERO
mpa dè rindon	I.A.2	SURA
kutùk tanğà	I.A.2	TANGALE
bījimi	I.A.2.	BOLE (WA)
ndimizi	I.A.2.	GERA
bījīmī	I.A.2.	NGAMO
kwàmén	I.B.1	BADE
kwê̄m	I.B.1	NGIZIM
0	I.B.2	BULI
nanàk	I.B.2	BURMA
la	I.B.2	DIRA
ła	I.B.2	DWOT

yenfa	I.B.2	GEJI
lembì	I.B.2	MIYA
fa	I.B.2	PəLCI
bijimi	I.B.2	SEYA (WA)
xišlètə	II.A.1	BOKA
xifata	II.A.1	GA'BIN
hiŋata	II.A.1	GA?ANDA (MOKAR)
kwèl	II.A.1	HWONA
ða	II.A.1	PIDIMDI
gyèl	II.A.2	BURA
bilenfa	II.A.2	CIBAK
fa	II.A.2	HILDI
hāhāldi	II.A.2	KILBA
kīnyam	II.A.2	MARGI
fà səl	II.A.2	NGWAXI
micufa	II.A.2	WAMDIU
dàlo / səl	II.A.2	WEST MARGI (PUTE)
m(i)car	II.A.3	FALI GILI
=viliku	II.A.3	FALI KIRIA
mcè	II.A.3	HIGI BAZA
mcu	II.A.3	HIGI FUTU
fa	II.A.3	HIGI GHYE
mca fa	II.A.3	HIGI KAMALE
mpca	II.A.3	HIGI NKAFA
muŋgùðən	II.A.4	FALI BWAGIRA
vilèxəy	II.A.4	FALI JILBU
mikiđu	II.A.4	FALI MUCELLA
kawà	II.A.4	GAVA
kawà	II.A.4	GELEVDA
dàlo	II.A.4	MANDARA
kawà	II.A.4	NAKATSA
mari	II.A.5	MATAKAM
mələv	II.A.7	DABA
ðùgùley	II.A.8	BACAMA
bubuŋa	II.A.8	GUDE

lɔ	II.A.8	GUDU
ɲzónákò	II.A.8	MWULYEN
nəkwo	II.A.8	NJANYE
deyelè	II.A.8	ZAGVANA
buljuva	IV	BANANA
buhlufna	IV	BANANA (MOUSEYE)
náəmənśi	IV	LAME
ba nao	IV	LAME (PEVE)
bouba naou	IV	MISME (ZIME)
put jufna	IV	MASA
Non-Chadic		
ndək		BANKALA
ndəxa		JAKU
əmuj		JARI
nàyhúnà		YINGILUM

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