SEGMENT REVERSAL IN KULIAK AND ITS RELATIONSHIP TO NILO-SAHARAN

DRAFT ONLY

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Roger Blench
Kay Williamson Educational Foundation
8, Guest Road
Cambridge CB1 2AL
United Kingdom
Voice/ Ans 0044-(0)1223-560687
Mobile worldwide (00-44)-(0)7847-495590
E-mail rogerblench@yahoo.co.uk
http://www.rogerblench.info/RBOP.htm

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1. Introduction

Since the first documentation appeared, the classification of the Kuliak languages, largely represented by Ik, has been the subject of continuing controversy and a great deal of misinformed speculation. Greenberg (1950) in his first overview of African language classification, treated 'Nyangiya' as a separate language group, a position he maintained through several revisions of his views. Tucker & Bryan (1956:93) were the first to recognise the four languages we now consider forming the Kuliak group, but they put forward no further suggestions as to their external affiliation. When Greenberg (1963) came to synthesise his African language classifications, Kuliak was placed within Eastern Sudanic. Regrettably, the Ethnologue (2013) still repeats this view, despite Heine's (1975/6) critique.

Fleming (1983a) has a lengthy essay on the external affiliations of the Kuliak lexicon. He considers both connections with Nilo-Saharan and Afroasiatic languages, especially Cushitic and Omotic. Unlike the correspondences with Southern Nilotic, many of these can only be adopted with the eye of faith. Both semantics and phonology are highly variable, and few of his proposals would be accepted unequivocally. At the same time, there is no doubt that the Kuliak languages have interacted with their Afroasiatic neighbours to the east and north, and this in turn has been the source of considerable ill-considered speculation. Tucker (1971-3) misleadingly referred to similarities with Cushitic and Ancient Egyptian, and Lamberti (1988) wrote a book-length study of the correspondences to Eastern Cushitic, claiming there was a genetic relationship. It is safe to say that while these similarities must sometimes represent cognate words, this is a consequence of borrowing. One important aspect of contact is the spread of case systems in Africa (König 2008). Case-marking is probably not an underlying feature of Nilo-Saharan, but it is widespread in its eastern branches which have been in contact with Afroasiatic, including Kuliak. It is likely that case-marking spread from one phylum to another (and indeed into Niger-Congo, where it is recorded in the Koalib group of Kordofanian).

Subsequent authors, taking a broader perspective on Nilo-Saharan, have treated Kuliak as a distinct branch of Nilo-Saharan. Bender (1997) published many overviews of Nilo-Saharan, and Kuliak was treated as a single branch outlier, parallel with, but showing no particular relationship to, Songhay and Saharan. Bender rejects any particular relationship with Eastern Sudanic. Ehret (1981b, 2001) typically takes an entirely different view. He renames Eastern Sudanic 'Eastern Sahelian' and makes 'Rub' (i.e. Kuliak) one of its co-ordinate branches.

Recent years have seen a significant expansion of lexical data on Kuliak languages (Heine 1999; Heine & Carlin n.d.; Beer et al. 2009; Shrock p.c.) as well as studies of the grammar (e.g. Sersisko 1992; König 2002) and it is time to take a more informed perspective. Certainly the evidence presented for previous classifications is any extremely thin. Kuliak is a distinct branch, but co-ordinate with a large grouping of languages spread across Sudan, including Eastern Sudanic, Kadu, Maban and Fur. Kuliak has a number of morphological features, including singulatives in –tV- (-at- in Kuliak) which align it with these languages and which do not occur in Bertha and Kunama. Kuliak has some apparent similarities in phonology with Koman due to early interaction with Afroasiatic languages, but these do not point to a genetic relationship.

However, there is a particular feature of Kuliak morphology which seems not to have been previously discussed, segment reversal. Characteristically, forms that are CV in other branches of Nilo-Saharan can surface as VC in Kuliak. This relationship is not unknown between and within other branches of Nilo-Saharan but it is strikingly prevalent in Kuliak. Metathesis, where initial and coda consonants reverse, also occurs in Nilo-Saharan, but I believe segment reversal is distinct. This paper gives a series of examples to provide evidence for this process, and puts forward a hypothesis to explain it.

2. Brief introduction to the Kuliak languages

Kuliak is usually said to consist of four languages, two of which are living, spoken in NE Uganda and adjoining regions of Kenya. The term 'Rub' is used in Ehret (2001) based on the common term for 'person', but has not been generally adopted. The Kuliak languages are shown in Table 1;

Table 1. The Kuliak languages

Name	Autonym	Other names
Ik	Ic'am pl. Ik^n	Teuzo, Icietot, Teuso, Teuth Ngulak.
So	Sor'at pl. Sɔɔ	Sɔ, Soo, Tepeth
Nyangi	Nyangi'at pl. Nyang'i	Nyaŋi, Nyangeya, Ngiangeya, Nipori, Niporen, Poren, Ngapore, Upale
Dorobo		Wanderobo

Dorobo is known only from Wayland (1931), analysed in Heine (1976), but no speakers have been encountered in recent times. Schrock (p.c.) considers that Wayland's list was Ik, and that mistakes in elicitation have made it seem distinct. Driberg (1932: 604-5) recorded the first wordlist of Nyangi and had already noted that the 'Nyangiya' were switching to Dodoth, a Nilotic language; he estimated there were a 'few hundred' speakers in the early 1930s. Heine (1974/75) recorded almost all that is known of the language and noted there were no speakers under forty years of age. Fleming (1983a) refers to a manuscript on Nyangiya by Weatherby but this has not been circulated. Schrock (p.c.) was able to record a short wordlist from rememberers in 200?, and work is still current with some very old speakers.

The So are a group of former hunter-gatherers living on three mountains, Moroto, Napak and Kadam, in northeast Uganda. They were researched in the 1960s by Weatherby (1969), Laughlin (1975), Laughlin & Laughlin (1972, 1974) and Laughlin & Allgeier (1979). They have become dispersed among the Karimojong, and their society has undergone a significant breakdown since this era. The first account of the So language is in Heine (1974/1975) with a more extended description in Carlin (1993). The So language was still quite vigorous when Carlin was in the field but was already in decline, giving way to Karimojong. An unpublished dictionary (Heine & Carlin n.d.) is posted on the internet[1]. There is a somewhat difficult of access study of So ethnobotany (Heine & König 1988). More recently, another grammatical sketch has been circulated (Beer et al. 2009). So is only spoken by around sixty older speakers who live scattered in Karimojong communities and no longer form a speech community.

The Ik people live in a number of parishes in Moroto district, NE Uganda (Map 1). Today they are farmers and cattle-keepers but were probably hunter-gatherers until recent times. The first study to drawn attention to the Ik people was the work of the anthropologist Colin Turnbull (1967, 1972). He painted such a depressing account of Ik society that this was taken as an illustration of 'ultimate evil' and indeed turned into a piece of fashionable theatre. Regrettably (though not for the Ik) his account turned out to be largely nonsense (Heine 1985). By all accounts, the Ik, though still marginal, are flourishing, especially since the threat of Turkana raiding has been much reduced.

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[1] At http://www.rogerblench.info/Language%20data/Nilo-Saharan/Kuliak/So%20dictionary.pdf

Map 1. Ik-speaking area of NE Uganda

Source: Redrawn from Wiedemann & Nannyombi (2007)

Wayland (1931) published a vocabulary of Ik, and Father Crazzolara (1967) an unpublished grammar and vocabulary. The first modern account of the Ik language appeared in Tucker (1967, 1972) and apart from comparisons with Ancient Egyptian [!] was disturbingly inaccurate. Serzisko (1987, 1998, 1992) and Heine (1975, 1990, 1999) have described some aspects of its structure. Other studies from the same group of scholars include the lengthy account of case in Ik by Christa König (2002). Unlike the other languages in this group, Ik appears to be still vigorous (Wiedemann & Nannyombi 2007) and a locally-published lexicon has been issued as part of a vernacular education programme (Schrock 2011). The proposed orthography currently does not mark vowel-quality or tone. A 1700 item wordlist with audio recordings is available on the Comparalex website.

Heine (1976) is a comparative grammar and vocabulary of proto-Kuliak, providing reconstructed forms. Serzisko is an overview of structural features of the group as a whole. Ehret (1981a) put forward some proposals for revising this, based on re-analysis of Heine's materials. However, with the much more extensive lexical material available today, a more in-depth comparison is now possible.

Table 2 gives a summary of the status of the Kuliak languages. Given the considerable interest in endangered languages, it is a great pity that so little attention has been paid to these important and rapidly disappearing languages.

Table 2. Status of the Kuliak languages

Name	Status	Reference
Ik	16,000[2]	2002 census
So	sixty speakers	Beer et al. (2009)
Nyangi	only rememberers	Schrock (p.c.)
Dorobo	probably not distinct	Heine (1975)

3. A brief introduction to Kuliak morphology

Kuliak languages are undoubtedly Nilo-Saharan, despite clear evidence for contact with Cushitic (Lamberti 1988). The elaborate phonology, which includes a glottalised series, may also reflect Afroasiatic contact. The Koman and Gumuz languages also have similar phonemes, which led Ehret (2001) to conclude, erroneously, that these were to be attributed to proto-Nilo-Saharan. Ik also has lateral fricatives, which either reflect contact with a forger substrate language such as Hadza, or else were features of Cushitic at some earlier stage, as they are of Southern Cushitic today. Typical features of the morphology are the three-term number system with a singulative in –at and complex verbal extension system. The case-marking system strongly resembles that found in East Sudanic languages (König 2008; Dimmendaal 2001; Schrock 2012) but whether this is an archaic feature or a consequence of Afroasiatic contact is still unresolved.

However, apart from these underlying features, there appear to be layers of borrowing from Nilo-Saharan. Heine (1976) first observed an apparent relationship between Kuliak and Southern Nilotic and Rottland (1983) undertook a systematic comparison, demonstrating a number of close lexical correspondences. Heine (1976:71) considered various hypotheses to explain this and suggested the possibility that there was once a much larger group of languages which covered an area well to the south of their present region. As Southern Nilotic expanded, Kuliak was maintained as a substrate within its basic lexicon. Ehret (1981b) made a rather contorted argument for the existence of a lost branch of Southern Nilotic influencing Kuliak, but Rottland (1983) shows this is quite unnecessary. These similarities were undoubtedly the source of the mistaken idea that Kuliak was a part of Eastern Sudanic, and incidentally a good illustration of the erroneous conclusions that can sometimes result from 'mass comparison'. A more credible interpretation of the similarities with Southern Nilotic is that these languages were further north when they interacted with the ancestors of modern Kuliak. The borrowings are probably not in a single direction but reflect the usual mosaic produced by contact when highly mobile populations are in touch with one another.

In more recent times, direct contact with the Karimojong people (and indeed sometimes violent conflict) as well as the creation of a national park in the region have meant extensive borrowing and in the case of the So and Nyangi, assimilation. Most So have switched to Karimojong, and even when the language was recorded by Heine and Carlin in the 1980s, there were many loans, as well as doublets, where older forms persist alongside loans. Since the languages are related at some deeper level, and there in undoubtedly also re-analysis, sorting out the history of some words is complex.

A tripartite numbering system can be reconstructed for proto-Kuliak nominals. In Ik and So, most nouns have a singulative in –at. Carlin (1993: 74) notes the similarity to Karimojong and assumes this is a borrowing. However, Kuliak typically metathesises common Nilo-Saharan markers, and –ta is a typical and widespread singulative. So has an additional singulative, -an. Ik now has just two plural markers, -ik and –itin, whereas So has quite a diverse range, some of which have semantic associations (Table 3).

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[2] This figure seems very high and is derived from census reports. Mst likely there are many fewer fluent Ik speakers.

Table 3. So plural suffixes

Suffix	Semantics	Comment
-ek	body parts	also Ik
-tin	human artefacts	also Ik
-e	diverse	
-Ut (-ot, -ut, -ʊt)	diverse	
-an	human artefacts	cf. Ik singulative
-uk	human beings	
-in, -en	small and thin things	
-On (-on, -ɔn)	diverse	
-is	only one noun 'tree'	

Source: Adapted from Carlin (1993)

Beer et al. (2009) record additional low frequency plural markers, which may be partly due to dialect differences. Ik shows considerable traces of frozen nominal morphology and it seems likely that proto-Kuliak had a system more like So. However, comparison with the nominal morphology of Western Nilotic, as described by Storch (2005), also points to similarities, so contact with Nilotic is clearly also part of the explanation.

The shape of nouns is also surprisingly diverse and probably reflects this complex history of descent and contact. All three documented languages have a distinct set of nouns (and occasional verbs) with the formula VC, shown in Table 4;

Table 4. Kuliak VC roots

Gloss	Ik	So	Nyangi
animal	ínw		
ashes		uk	ukʷ
black		im	im
bone	ɔkᵃ	ɔk	ɔk
bottom	óz		
carry on back	ed	ed	
chew, eat hard foods	ats'	adʒadʒ	adʒ
child, son	im		
come	ats	atʃ	atʃ
current, flow, flood	ísw		
drunkenness	és		
excrement, faeces	ets'	ij	ij
eye, seed	ekw	ɛk	ɛkw
far	aƙ	ag	ag
hand		an	an
head	ik	ik	ik
herd		éak	akw
hole		or	or
horn, antenna, big flute, gun	éb	ɛb	ɛb
house		ir	ir
in, inside	aƙw	ag	agw
increase	at	éat	
infinitive suffix		-ug	-ug
inner cheek	ɔ́b		
knock		iɲ	iɲ
know	íɫy-és	es	yes
man, husband	yakw		
meat	em	ɛm	ɛm

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Gloss	Ik	So	Nyangi
migrate		og	og
milk	id	id	id
mouth, hole, den	ak	ak	ak
name	éd		
near		ɛr	ɛr
other		ɛd	ɛd
person	ám		
pestle used esp. for white ants	àdʒ		
place, homestead, village	aw		
plural suffix	-ik	-ek	-ek
road		od	od
rope	uun		un
seed, grain	eɗ		
side, direction	ay		
skin		ar	ar
soft dry grass	úd		
sore, wound	ɔ́jᵃ	ɔj	ɔj
strangle	ik	ikɛt	ik
swell	ɛm	ɛm	ɛm
sycamore fig	áts'		
termite sp. outside their hill	ɛs		
thigh	ob		ob
thorn		as	as
three	adᵉ̀	ɔn	ɔn
tongue		ɛdɛɓ	ɛd
tree		ad	ad
vomit	ɛn	ɛn	ɛn
what?	ìs		

Although containing many common lexical items, these constitute only a small subset of the overall vocabulary. Nouns beginning with V, usually with the formula VCV(C), are also quite common, but CVC(V) nouns predominate. The VC shape is relatively rare in Nilo-Saharan as a whole, and extremely uncommon in Africa as a whole. So it seems worthwhile asking how it has arisen. As §4. will demonstrate, many of these items can be linked to a CV formula elsewhere in Nilo-Saharan and it is possible that this was a regular process at the period when proto-Kuliak was evolving.

4. Data

4.1 Tables illustrating segment reversal

The following tables present comparisons between Kuliak languages and other branches of Nilo-Saharan, where there is evidence for segment reversal.

1. tree

Family	Subgroup	Language	Attestation	Gloss	Source
Koman		Opo	tʲa	tree	Be83
Gumuz			ɟá	tree	Ah
Kunama			uuda	tree	check
Kuliak		So	ad pl. ed-s	tree, shrub	HC
Kuliak		Ik	dakʷ	tree	He99
ES	Daju	Shatt	è(e)t	tree	Bo08
Maban		Maba	dáá	wood beam	Ed91c
Saharan	East	Sagato	dā	wood	Pe87

Commentary: This root is attested as far as Saharan and both So and Shatt show segment reversa. However, Ik appears to retain the original CV ordering. Cushitic languages have *'əɖ*, which may be related.

Refs: B. 82

2. #ʃa eat

Family	Subgroup	Language	Attestation	Gloss	Source
Koman		PK	*ʃa	eat	Be83
Gumuz	Guba		sa	eat	Ah04
Kuliak		Ik	ats'-es	bite, chew, eat hard food	Sc11
ES	E Jebel	Twampa	ʃwa	eat	Be97
ES	Surmic	Mursi	usa	eat	TYO08
ES	Daju	Shatt	sia	eat	
ES		Meroitic	sín	eat	Ri09
Furan		Fur	ʔəssì	to bite	Wa10
CS		Gula Mere	ùsà	*manger (dur)*	Bo00
CS		Bagirmi	sà	eat	RCS
Saharan		Beria	sie	eat	

Commentary:

Ref: G. 70:696; E. 387, 518;

3. #kule head

Family	Subgroup	Language	Attestation	Gloss	Source
Kuliak		P-Kuliak	*ik	head	He76
Shabo		Shabo	ƙoy	head	Fl91
Koman		PK	*kup	head	Be83
Koman		Komo	koro	chief	
Gumuz		CG	*kʷa	head	Ah04
Bertha			agur	king	
ES	E Nilotic	Turkana	akou	head	Oh89
ES	E Nilotic	Bari	k-we	head	
ES		Nara	kele	head	
ES		Meroitic	kʷur (ꟼꞷ)	*souverain*	Ri09
Kadu		Krongo	kwaara	chief	
Furan		Amdang	kuyɛ	*tête*	Wo10
Maban		Masalit	kuron	chief	Ed91
Saharan		Kanuri	kə̀lâ	head	Cy94

Commentary: The original root may have been something like #*kule*, to account for the combinations of front and back vowels that persist throughout Nilo-Saharan. Kuliak seems to have first lost the medial

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segments and then reversed those remaining. The epenthetic (^{w}) which surfaces in Ik (*ik^w*) is presumably the trace of this process. South Nilotic has innovated with **met* for 'head' (Rottland 1982) so this cannot be an influence on Kuliak.

Refs: B. 79; R. 26;

4.	#k^{w}a	bone			
Family	**Group**	**Language**	**Attestation**	**Gloss**	**Source**
Kuliak		Ik	*ɔk	bone	He76
Gumuz		Guba	ʒik^{w}a	bone	Ah04
Bertha		Mayu	k'aara	bone	B-G07
ES	Nilotic	PN	*käw	bone	Di88
Kadu		Katcha	kùbà	bone	RCS
Maban		Maba	kàɲí-k	bone	Ed91
CS		MMD	k^{w}a	bone	B&W96
CS	MM	Madi	kwà	bone	
CS	LN	Lendu	kpa	*os*	
CS		Birri	kpɔ	bone	Sa50
CS	SBB	Sar	kɨ̄ngā	*os*	Bo00

Commentary: Only Kuliak seems to have undergone segment reversal.

Refs:

5.	road				
Family	**Subgroup**	**Language**	**Attestation**	**Gloss**	**Source**
Kuliak		So	oɗ	road, path, way	HC
Koman		Gule	adon	road	
Gumuz		Guba	ŋdoa	road	Ah04
ES	E Jebel	Gaam	tɛɛd	road	
ES	Nilotic	Dinka	dhöl	road	
ES	Nubian	Birgid	tondi		
ES	Tama	Tama	tár	road	
Furan		Fur	d-ɔrá	road	Wa10
CS		Kenga	ɗóóbò	*chemin*	Pa04
CS		Jur Beli	te	path	
Saharan		Daza	tɔrɔɔ		

Commentary: The original form of this root must have been something like #*ɗona*, with a continuant in C$_2$ position, realised as n/l/r in different languages. Evidence that the original d- was implosive, as in So, is also attested in Central Sudanic and Nilotic. So and Nyangi have deleted the second syllable before inverting the root, as with 'bone'.

Ref: Gr. 144

6.   excrement

Family	Subgroup	Language	Attestation
Kuliak		Ik	ets'
Kuliak		So	ij
ES		Nara	iʃ
ES	Nilotic	Ongamo	na-ʃiʃi
ES	Taman	Sungor	iʃi
CS		Bulala	isi
CS		Bongo	iʃi

Commentary:

7.   person, man

Family	Subgroup	Language	Attestation	Gloss	Source
Kuliak		Ik	yakʷ	man, husband	Sch12
Koman		Opuuo	okas	man	RCS
Kunama		Kunama	ka	man	RCS
Kunama		Ilit	kaad-a	man	RCS
ES	Nara	Nara	kúú	man	Ha00
ES	Daju		kaŋgi	person	
ES	Ama	Ama	kwày	man	Be00
Maban		Maba	kàŋ	person	Ed91
Fur		Fur	kwa	people	
Maban		Masalit	kamba		Ed91
Saharan	West	Kanuri	kâm, kwâ	man	Cy94

8.   male

Family	Subgroup	Language	Attestation	Gloss	Source
Kuliak		Ik		ám	person	Sc12
ES	Surmic	Murle		máatʃ	male	Yi01
ES	Surmic	Majang		maɲa	elder brother	Jo07
ES	Nubian	Old Nubian		ⲙⲉⲧⲉ	generation	
ES		Meroitic	maɕe (𐦳𐦵𐦮)	*enfant, fils*	Ri09
ES	Tama	Tama		máata	boy	
Maban		Maba		maʃuk	husband	
CS	MM	Madi		màdī	person	Bl00
CS	MM	Logo Bari		mādí	person	B&W96
CS	ME	Mvuba		ìmá	*mère*	DD
CS		Birri		ama	female (?)	
CS	SBB	Yulu		mɛ̀ɛ̀cɔ̄	*beau-parent*	Bo00
CS	SBB	Bongo		máaꜜ	*enfant; neveu*	PN
Saharan	East	Beria		màmâ	*oncle maternel*	JC04

Commentary:

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9. #tV- to pour

Family	Subgroup	Language	Attestation	Gloss	Source
Koman		T'wampa	tʰēr	to pour off liquid	Be83
Kunama		Kunama	'todà	to pour out water	Be01
Kuliak		Ik	ot-és	to pour	He99
Kuliak		So	ɔr-a	to pour in	HC
Maba		Aiki	tɛnd /tɛ	*verser*	No89
CS	MM	Maɗi	sò *pl.* tū	to pour	Bl00
Saharan		Kanuri	tá(b)-	to pour	Cy94

10. to say

Family	Subgroup	Language	Attestation	Gloss	Source
Kuliak		So	at	say	HC
Koman		Opo	tan	say	Be83
Koman		Gwama	t'waʔat'wa	tell	KR11
ES	Surmic	Majang	tunɔŋ	say	Jo07
ES	Ama	Ama	tánde	talk	Ki96
ES	Taman	Ibiri	táa nì	speak, talk	Ed91b
Kadu		Talasa	aɖɛ́ɛ́ma	speak	Sch94
Furan		Amdang	ʔuldunu	*dire*	Wo10
Maban		Aiki	ndɛn	*parler, dire*	No89
CS	MM	Logo	tà	say	B&W96
CS	KA	Kresh	àdə̀	*dire*	Bo00
CS	FS	Formona	adama	say	Ha78

11. lie down

Family	Subgroup	Language	Attestation	Gloss	Source
Gumuz			ampéʔ	lie down	Ah04
Kunama			abe		
Kuliak		Ik	ep-on	sleep, lie down	He99
ES	Nubian	Kenzi	bu		
ES	Tama	Merarit	abney		
Maban		Maba	bi		
CS	ME	Efe	àbō	*dormir*	DD
CS	KA	Kresh	ɓíɓí	*dormir*	Bo00
CS	SBB	Mbay	bi	lie down	
Saharan		Kanuri	bo		

Commentary:

Ref: Gr. 101, 141;

12. #ta three

Family	Subgroup	Language	Attestation	Source
Shabo		Shabo	ʤii-ta	Jo07
Berta		Malkan	odo	
Kuliak		Ik	aɗ	He99
ES	Nilotic	Maiak	ɗŏk	
ES	Nubian	Meidob	táasi	
ES	Temein	Temein	kwɔ́ʈaná?	RCS
ES		Gaam	ɔ́tɔ́	
Kadu		Keiga	ɖɔ́ɔ́ná	Sch94

Commentary: The following example is not exactly the same as the others listed here, as it is a true metathesis, where a CVC segment swaps consonants, in this case Nilo-Saharan bVr becomes Kuliak rV6-.

13.	person	man, male			
Family	**Subgroup**	**Language**	**Attestation**	**Gloss**	**Source**
Kuliak		Ik	ám pl. róɓ	person	He99
ES	Surmic	Didinga	boro	man	
ES	Surmic	Me'en	bole	boy	
ES	Meroitic	Meroitic	abara	*homme*	Ri09
Kadu		Krongo	ɓala		check
Mabaan		Maba	mbara	brother	
Fur		Fur	bara	brother	
CS	MM	Madi	ɓá	man	Bl00
CS	KA	Kresh	belu	man	Sa76
Saharan	East	Beria	bòrō	*homme, mari*	JC04
Songhay	South	Zarma	bòró	*personne*	BW94

4.2 VC nominal and verbal affixes

The common number markers in Kuliak also appear to undergo segment reversal. Kuliak languages have a singulative in *-at*, which corresponds to *ta-* in Eastern Sudanic and Kadu. There is also a plural marker *-Vk*, which is the same as the *kV-* affix attested elsewhere. The table shows Temein plurals which copy the affix and then lose the final *-V* giving the appearance of a Vk- marker (Blench in press).

Gloss	Unmarked	Plural
belly	óòm	kómɪk
big	ḿbù	kɪmbɪk
hill, stone	kúrɛʈ	kukúrɛʈ
shield	wór	kwòráʔ

The Kadu languages all have singulatives in *tV-* where the vowel shows harmony with the root vowels of the stem. The table shows some examples from Katcha, taken from Gilley (in press).

Gloss	Singulative	Plural
'side of body'	t-ukulé	ukulé
'lion'	t-akaamʊ	akaamʊ
'unripe seed'	tɪ-kɪréérɛɓέ	kɪréérɛɓɛ
'k.o. grass'	ta-malaaya	malaaya

Bender (1997) gives numerous more examples of the 'moveable' affixes of Nilo-Saharan, which are not always number markers and may originally have been determiners. The process whereby they are copied from prefix to suffix and lose the final *-V* gives an initial appearance of a *-Vk* suffix and Kuliak probably represents a case where these have ceased to become productive, i.e. moveable. Almost certainly the *-Vn* suffix in So can be compared to the *nV-* affixes attested elsewhere in Nilo-Saharan.

4.3 Examples where segment reversal is also attested elsewhere

The tables in 4.1 give occasional examples of where Kuliak segment reversal is attested elsewhere in Nilo-Saharan, but there are a few glosses where VC structures are usual throughout. The tables below give some examples of these;

14.		milk			
Family	**Subgroup**	**Language**	**Attestation**	**Gloss**	**Source**
Shabo			il[3]	human milk	
Bertha			irr	milk, breast	TU89
Kuliak		PK	*id	milk	He76
Kuliak		Ik	íd^w	milk	He99
ES	E Jebel	Aka	eeri	milk	
ES	Surmic	Mursi	úrò	milk	
ES	Surmic	Majang	il	human milk	
ES	Nubian	Kenzi	erti	breasts	
ES		Meroitic	ira ɯ	*lait*	Ri09
ES	Nyimang	Ama	èlò	milk	
ES	Daju	PD	-idi-	breast	

Commentary: Unlike the remaining roots discussed here, the VC form is widespread in Eastern Sudanic and in neighbouring languages, including Shabo.

References: R. 40;

15.		ashes			
Group	**Subgroup**	**Language**	**Attestation**	**Gloss**	**Source**
Kuliak		So	uk	ash	HC
Kuliak		Ik	kau		He99
ES	Surmic	Mursi	bur	ashes	TYO08
ES	Temein	Temein	úluk	ashes	RCS
CS		Sinyar	kabʊr	ashes	Ha78
CS	SBB	Modo	bùrúkù	*cendres*	Bo00
CS	SBB	Bongo	bùrùkú	*cendres*	Bo00
CS	SBB	Yulu	vùkù	*feu*	?
CS	SBB	Fer	úk	*cendres*	Bo87

16.		mouth			
Family	**Subgroup**	**Language**	**Attestation**	**Gloss**	**Source**
Kuliak		P-Kuliak	*ak	mouth, voice, language	He76
ES		Nara	àwòlà	mouth	Ha00
ES	E Jebel	Gaam	ag	mouth	St
ES	Ama	Ama	ŋàl	mouth	Be00
ES	Ama	Afitti	ŋìlà	mouth	Be00
ES	Nubian	Dongola	agil	mouth	
ES	Nubian	Mahas	ag		
ES	Tama	Tama	əwl	mouth	Be97
CS	KA	Kresh	àkpà	*bouche*	Bo00
CS	SBB	Modo	kpà	*bouche*	Bo00

Commentary:

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[3] unless borrowed from Majang

17.   name

Family	Subgroup	Language	Attestation					Gloss	Source
Kuliak		Ik		é	d			name	Sc12
ES		Nara		a	d	e		name	
ES	Nilotic	Bari	k	a	r	ɛ́	n	name	
ES	Temein	Temein	k	à	l	í	n	name	RCS
ES	Nubian	Meidob		ee	r	e		name	
Kadu		Keiga		ɛ̀	r	ɛ̀		name	Sch94
Fur			k	a	r	i	o	name	
CS	MM	Madi			r	ú		name	Bl00
CS	KA	Kresh	d	í	r	í		*nom*	Bo00
CS	FS	Formona		e	r	e		name	Ha78
CS	SBB	Bagirmi			r	i			
CS	SBB	Baka		ì	r	ì		*nom*	Bo00
CS	SBB	Ngambay			r	ī		*nom*	Bo00

Commentary:

18.   horn

Family	Subgroup	Language	Attestation	Gloss	Source
Koman		Kwama	kwaap		Be83
Kuliak		Ik	ɛb	horn	He99
ES	Surmic	Majang	kulbe	horn	Schn
ES	W Nilotic	Lango	ip	horn	
ES	Nubian	Dilling	eb	horn	
Furan		Fur	kòlbá	horn	AJ
Furan		Amdang	kʰɛlfi	*corne*	Wo10

Commentary:

References: G. 140; B. 79

5. And what is the explanation?

The data tables seem to present sufficient evidence that segment reversal does occur in Kuliak in relation to the remainder of Nilo-Saharan. However, it also shows that similar outcomes can occur elsewhere, and in the case of a word like 'milk', VC appears to be the dominant form across many branches. But these examples may arise from a process of C_1 deletion, which is common in many branches of Nilo-Saharan, and may not be examples of reversal, though they are clearly related.

However, segment reversal is clearly a morphological process which is part of Nilo-Saharan, and presumably related to metathesis. It is not now restricted to any particular part of speech, occurring in nouns, verbs and numerals at least. Documentation for a semantic function for metathesis is quite limited. We know that in Fur (Jakobi 1993), when a CV verb root is prefixed by consonantal person (Cp) marker it becomes CV. Thus;

Gloss	Root	With marker
'drink'	ba-	Cp+ab-

This process is applied to verbs in Fur, but it is easy to imagine it could be applied to other parts of speech if some similar prefix is required. However, in Kuliak this is not a regular process, as many CV verb roots do not appear to undergo reversal. So there are two possible explanations. Either this process was not part of the original morphological system of Kuliak and it has been partially adopted through contact, so that the languages are in a transitional state, or it was a common process in Kuliak, but has degraded. A number of

solutions are possible at this point, but affix copying, subsequent partial erosion and then regularisation across the system seems most credible.

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