A NOTE ON AN INVERSION MARKER IN WARUMUNGU PRONOMINAL CLITICS[1]

JANE SIMPSON

1. INTRODUCTION

Warumungu is a Pama-Nyungan language spoken in the northern part of Central Australia with an unusual pronominal system. Perhaps the most striking feature of this system is an inversion marker *-ngki* or *-ngku*,[2] which, when attached to certain pronominal clusters of Subject (S) acting on Object (O) inverts the order in which they are interpreted. Thus (1) and (2) show first person plural exclusive and third person plural S.[3]

(1) *Walpu-nyu   ankkul*
     hit-PAST.PUNctual 1PL.E
     We hit him.

(2) *Walpu-nyu   ajjul*
     hit-PAST.PUN 3PL
     They hit him.

Example (3) shows the normal order of S and O in a pronoun cluster:

(3) *Walpu-nyu   ankul-jarni*
     hit-PAST.PUN 1PL.E-3PL
     We hit them.

In (4) however exactly the same order of pronouns holds, but a marker *-ngki* is added, which indicates that the pronominal cluster denotes not first person S acting on third person O, but rather the inverse: third person S acting on first person O:

(4) *Walpu-nyu   ankul-jarni-ngkki*
     hit-PAST.PUN 1PL.E-3PL-inversion
     They hit us.

In a hierarchy of person, first person outranks third person, and so I have called this marker an inversion marker. It resembles the inversion markers *-n* and *-gu* in Nunggubuyu and Ngandi, described in Heath (1976).[4] However, its distribution is not as widespread as these markers, since it occurs unambiguously only with third person plural S acting on first person plural O.

This paper discusses the inversion marker, firstly in the context of the Warumungu pronominal system, and secondly with respect to corresponding forms in neighbouring languages, including the non-Pama-Nyungan language Wambaya. I shall suggest that it has been analysed as a non-singular O marker, and that this is an areal feature which crosses genetic boundaries in northern central Australia. As Luise Hercus has worked on one of these languages (Wambaya), I offer this brief description as a tribute to her pioneering work in descriptive and comparative linguistics.

2. THE WARUMUNGU PRONOMINAL SYSTEM

In Warumungu, nominals bearing the grammatical function 'subject' are marked by ERGative or ABSolutive case, while nominals bearing the grammatical function 'object' are marked by ABS or DATive case. There are two types of pronouns: free possessive pronouns which act like nominals, and bound pronouns which directly represent subject, object and certain indirect objects. The inversion marker is part of the bound pronoun system, which I now outline.

2.1 BOUND PRONOUNS

Syntactically, Warumungu pronominals are used either on their own as arguments of the sentence (5) or in agreement with other nominals (6), that is, cross-referencing other arguments of the sentence:

(5)   *Wangka-n + arni*
       speak-PRESent + 1SG
       I'm speaking.

(6)   *Pikapikka + ajjul   ngala   wilyarra-ja-nta*
       children + 3PL   here   play-stand-PRES
       The children are playing here.

One pronominal form is used for transitive and intransitive subject functions (the S form) and another form for the O function (the O form).[5] The pronouns are most commonly used as enclitics following the first major constituent (verb, noun phrase etc.) of the clause, as in (5) and (6). Phonologically, pronouns can occur either as enclitics or as independent words.[6]

Perhaps the most striking feature of the Warumungu pronominal system is that there are no independent free pronominals, and S and O pronouns form an inseparable group ('pronominal cluster'). This cluster is sometimes impossible to divide into recognisable S and O morphemes. The simple form for pronominal S, as in (5), is also used for transitives with a third person singular O which is not expressed overtly, e.g. *arni*: 1SGS (5), or 1SGS acting on 3SGO (7). There is a special form for third person singular DAT O ending in *-kV* (where V indicates an assimilating high vowel), as in (12). With the exception of first person singular (whose REFLexive is identical to its O form (11)), REFL Os are formed with *-rnV* (9), and reflexive DATs[7] with an additional *-kV(l)* to the REFL form (10, 12).

(7)   *Wuru-ny(u) + arni*
       hit-PAST.PUN + 1SG
       I hit him (with thrown object).

(8)   *Juku-nt(a) + arn-akku*
       take-PRES + 1SG-3SG.DAT
       I am taking it to him.

(9)   *Angu-rnu   turrurl-pu-njjan*
       2SG-REFL   stretch-hit-PRES
       You stretch yourself.

(10)   *Ku-nul + angu-rnu-kkul*
       have-FUT + 2SG-REFL-DAT
       You keep (your husband) for yourself.

(11)   *Wuru-ny(u) + arn-ajju*
       hit-PAST.PUN + 1SG-REFL
       I hit myself (with thrown object).

(12)   *Juku-nt(a) + arn-aju-kku*
       take-PRES + 1SG-REFL-DAT
       I am bringing (it) for myself.

The full set of simple pronominal forms is displayed in Table 1.

TABLE 1
SIMPLE PRONOMINAL FORMS

Subject	Intrans. or 3sg O	3sg DAT O	REFL O	REFL DAT O
1sg	*arni*	*arnakku*	*arnajju*	*arnajukku(l)*
1du.i	*ayil*	*ayilikki*	*ayilirni*	*ayilirnikki(l)*
1du.e	*ajil*	*ajilikki*	*ajirni*	*ajirnikki(l)*
	ajjil			
1pl.i	*anyul*	*anyulukku*	*anyurnu*	*anyurnukku(l)*
1pl.e[8]	*ankkul*	*ankulukku*	*ankurnu*	*ankurnukku(l)*
2sg	*angi*	*angakku*	*angurnu*	*angurnukku(l)*
2du	*amppul*	*ampulukku*	*ampurnu*	*ampurnukku(l)*
2pl	*a(rr)kkul*	*a(rr)kulukku*	*a(rr)kurnu*	*a(rr)kurnukku(l)*
3sg	*(ama)*	*aku*	*awurnu*	*awurnukku(l)*
3du	*awul*	*awulukku*	*awulurnu*	*awulurnukku(l)*
3pl	*ajjul*	*ajulukku*	*ajurnu*	*ajurnukku(l)*

Transitive pronominal clusters including an overtly expressed O are given in Tables 2 and 3. If the verb takes a third person O which is DAT, not ABS, then *-kV* can sometimes be suffixed to the regular S-O pronominal cluster (13). If the O is first or second person, the same O form is used for both ABS and DAT O (14).

(13)   *kula-ny(i) + arn-akku*
       sing.out-PAST.PUN + 1SG-3SG.DAT
       I called out to him

(14)   *kula-nyi + ajju*
       call.out-PAST.PUN + 1SG
       (he) called out to me

TABLE 2
TRANSITIVE PRONOMINAL FORMS: THIRD PERSON OBJECT

			3rd person O	3rd person DAT (restricted[9])
1st person S				
1sg	→	3du	*arnapulu*	*arnapulukku*
1sg	→	3pl	*arnajurnu*	*arnajurnukku*
1pl.e	→	3pl	*ankuljarni*	*ankuljarnikki*
1pl.i	→	3pl	*anyuljarni*	*anyuljarnikki* [10]
2nd person S				
2sg	→	3du	*angapulu*	*angapulukku*
2sg	→	3pl	*angajurnu*	*angaju(r)*[11]*nukku*
2pl	→	3pl	*akuljarni*	*akuljarnikki*
3rd person S				
3sg	→	3du	*apulu*	*apulukku*
3sg	→	3pl	*aju(r)nu*	*aju(r)nukku*
3pl	→	3pl	*ajuljarni*	*ajuljarnikki*

TABLE 3
TRANSITIVE PRONOMINAL FORMS
FIRST AND SECOND PERSON OBJECT

	1st person Object			2nd person Object	
		Singular	Subject		
	3sg S	2sg S		3sg S	1sg S
1sg	*ajju*	*angajju*	2sg	*angku*	*arnangkku*
		anganjju			
1du.i	*ayingkki*		2du	*ampukku*	*arnampukku*
					arnapukku
1du.e	*ajikki*	*angajikki*			
1pl.i	*anyungkku*		2pl	*arrkku*	*arnturrkku*
1pl.e	*ankku*	*angankku*			
		Dual	Subject		
	3du S	2du S		3du S	1du S
1sg	*awulajji*	*ampulajji*	2sg	*awulu(r)nkku*	*ajili(r)nkki*
		Plural	Subject		
	3pl S	2pl S		3pl S	1pl S
1sg	*ajulajji*	*akulajji*	2sg	*ajulu(r)nkku*	
	ankulu(r)nkku				
1pl.i	*anyuljarni-ngkki*		2pl	*ajurntulku*	*alkurntukku*
	anyuljarni-kki			*ajultuku*	
1pl.e	*ankuljarni-ngkki*	*akularnkki*			
	ankuljarni-kki				

From Table 3 the operation of the inversion marker can be seen in two forms: third person plural S acting on first person plural exclusive and inclusive O. The alternation between *-ki* and *-ngki* is probably due to nasal cluster simplification.[12] On the basis of these forms alone, we might suppose that the *ngki* has been derived from the *ngkV* ERG case allomorph on disyllabic nouns.[13] That is, we might postulate that *-jarni-ngkki* was originally the ERG marked form of the third person S pronoun, which would naturally be used with an O. As Heath (1976) points out, inverse markers can develop from the ERG, as in Dalabon.

This ERG marking would have been lost on the third person non-singular S pronouns with zero third person O when these all levelled to end in a plural marker *l: ajjul, awul.* A trace of the original retroflex nasal is to be found in the alternate form *ajurntulku* for third person non-singular S acting on second person non-singular O. However, this still leaves unexplained the vowel alternation *u* in S, *a* in O. More importantly, analysing the inversion marker as an ERG leaves unexplained other forms in the pronominal system that resemble it. Thus the form *anyu-ngkku* (3sgS acting on 1pl.iO) should presumably be related. But here there is no appropriate stem for the ERG marker to attach to.

2.2 FORMS CORRESPONDING TO THE INVERSION MARKER

The form *anyu-ngkku* is one example of an apparent conspiracy within the bound pronoun system for non-singular O pronouns to end in *-ngkV* or *-kV.*

Firstly, there are forms which clearly end in a separate morpheme *-ngkV.* These are the first person inclusive O pronouns with third person singular S: *ayi-ngkki* (1du.iO), *anyu-ngkku* (1pl.iO). Here, the absence of the S non-singular marker *l* and the presence of *ngkV* indicates that the first person pronoun is acting as an O.

Secondly, there are two other dual O pronouns with third person singular S which end in *-kV: ampu-kku, aji-kki.* Here, the absence of *l* and the presence of *kV* indicate the O function. For *ampu-kku,* the absence of *ng* in the marker is perhaps due to simplification of the nasal-stop cluster as a result of the preceding *mp.* For *aji-kki,* the reason for the absence of the *ng* is unclear.

Of the other non-singular pronouns, most have base forms which end in *ku: ankkul, ankku* (1pl.eO) and *arrkkul, arrkku* (2plO). One might propose that these forms do not have an extra *kku* to avoid haplology. Other more opaque combinations containing these pronouns also end in *kku* or *ku: arnturrkku* (1sgS - 2plO), *akularnkki* (2plS - 1pl.eO), *ajultuku, ajurntulku,* (3plS - 2plO) and *alkurntukku* (1pl.eS - 2plO).

Two non-singular pronouns do not end in *kkV, ngkV* or *kV.* These are both third person – *apulu* and *ajurnu.* They are not complete exceptions, since they can end in *kkV* if they represent certain DAT arguments, *apulu-kku* (3duO) and *ajurnu-kku* (3plO) (Heath and Simpson 1982). This resembles the obligatory use of the third person singular DAT O pronoun *aku.* However, the non-third person pronouns neutralise the DAT/ABS O distinction.

On the basis of these forms we might reconstruct *ngkV* alternating with *k(k)V* as a non-singular non-third person O marker. While *ngkV* is identical to the ERG case marker on nouns, *k(k)V* is identical to the DAT case marker on nouns and on pronouns. As Heath (1976) points out, inverse markers can also develop from the Accusative as in Nunggubuyu, or from the DAT as in Ngandi.

2.3 POSSESSIVE PRONOUNS AND THE INVERSION MARKER

Another correspondence for the inversion marker is found in the possessive forms of pronouns. These appear to be formed on the basis of the O form (and on the DAT form for the third person singular). A list is given in Table 4.

TABLE 4
POSSESSIVE PRONOUNS

1sg	*ajji-nyi*	<	O -*ajju*
1du.i	*ayili-ngi-nyi*	<	O -*ayingkki*
		<	S -*ayil*
1du.e	*aji-ngi-nyi*	<	O -*aji-kki*
1pl.i	*anyi-ngi-nyi*	<	O -*anyu-ngkku*
1pl.e	*ankki-nyi*	<	O -*ankku*
2sg	*angki-nyi*	<	O -*angku*
2du	*ampi-ngi-nyi*	<	O -*ampu-kku*
2pl	*arrkki-nyi*	<	O -*arrkku*
3sg	*aki-nyi*	<	DAT -*aku*
3du	*apili-ngi-nyi*	<	O -*apili*[14]
3pl	*ajurnu-ngi-nyi*	<	O -*ajurnu* (3sgS - 3pl)

Note that the singular forms do not contain the augment *ngi*.[15] The forms for first and second person singular are formed on the singular O forms *ajju* and *angku*. The third person singular is formed on the singular DAT *aku*. This suggests that *ngi*, like *k(k)V* and *ngkV* which mark O, is restricted to non-singular forms. Next, notice that the two forms which I proposed contained *k(k)V* in themselves are also not followed by *ngi*: *arrkki-nyi*, *ankki-nyi*. They contrast with the non-singular third person forms which I noted could sometimes be followed by *k(k)V*. These are followed by *ngi*: *apili-ngi-nyi* and *ajurnu-ngi-nyi*. This suggests that the absence of *ngi* or *k(k)V* on the third person non-singular bound pronoun forms is merely a result of the maintenance of the division between DAT and ABS O forms in the third person bound pronouns.

It looks very much as though *ngi* is a realisation of the *k(k)V* and *ngkV* marker. We might propose that reduction of the cluster *ngkV* to *ngi* is triggered by the following nasal.

What then is the meaning of this marker? Generally, it appears to mark non-singular O in both the possessive and bound pronouns. In the bound pronouns, it acts as an inversion marker for non-singular S operating on non-singular O in the most marked case, that of third person S and first person O. While the possibility of the inversion having been derived from the ERG use remains attractive, the extended use as a general non-singular marker requires further explanation. Correspondences in nearby languages will prove useful for this.

3. CORRESPONDENCES WITH NEARBY LANGUAGES

Warumungu is a useful language to look for areal features in, because it is bounded by non-Pama-Nyungan languages (Jingili to the north and Wambaya to the north-east) and by Pama-Nyungan languages (the Arandic languages Alyawarr and Kaytej to the south and east, Ngarrkic and Ngumbin languages to the north and west (Warlmanpa, Warlpiri, and Mudbura) and Wakaya to the east). The Warumungu pronouns can be compared with these languages in terms of their morphological shape

and in terms of the structure of the pronominal cluster. Morphologically, they most resemble Arandic pronouns, while structurally they most resemble their northern neighbours.

3.1. COMPARISON OF MORPHOLOGICAL SHAPE

Table 5 shows the resemblances between Warumungu bound pronouns, Arandic free pronouns and Ngarrkic bound pronouns. Isolated pronouns show some correspondences in other neighbouring languages, but the forms in Table 5 show the most significant correspondences.

TABLE 5

CORRESPONDENCES OF WARUMUNGU PRONOMINALS

	Warumungu	Warlmanpa clitics	Proto-Arandic free forms[16]
1sg S	*arni*	*-rna*	
1sg O	*ajju*	*-ju*	*ətyə* (ERG, base for DAT)
2sg S	*angi*		*əŋə*
2sg O	*angku*	*-ngku*	*uŋkə*
3sg DAT	*aku*		*ukə*
1du.i S	*ayil*		*aylə*
1du.i O	*ayili-ngkki*		*aylə-kə*
2du S	*amppul*	*-npala*	*umpələ*
2du O	*ampu-kku*		*umpə-kə*
3du.	*apulu*	*-pala*	*ulə*
3pl.	*ajurnu*	*-jana*	*əṯŋə*
	-jarni		

3.2. COMPARISON OF STRUCTURE

Despite the morphological similarities, structurally, the pronominal clusters resemble the pronominal clusters of the Ngarrkic and Ngumbin languages, and Wambaya and Wakaya.[17] Like the Ngarrkic and Ngumbin languages, they show dual neutralisation. In the Ngarrkic and Ngumbin languages order within the cluster depends in part on S-O order, but in part on a person number hierarchy. Wambaya, Wakaya and the incipient pronominal clusters in Kaytej, however, hold to S-O order within the clusters. Warumungu follows the Wambaya and Wakaya pattern, with the notable exception of the inversion marker that we have been discussing.

3.3. COMPARABLE FORMS TO *ngV/ngkV/k(k)V*

For proto-Arandic Koch has reconstructed final elements of DAT forms of some pronouns: *-ŋə* 1sg and 2sg, *-ŋkə* du.e, *-kə* du.i, *-ke* 2du and 3du, and *-rə* 3sg. The first three of these look like the forms *ngV/ngkV/ngV* that we have reconstructed. However, they do not appear to be as regular. Nor are they restricted to non-singular.

Perhaps surprisingly, the non-Pama-Nyungan language Wambaya contains a marker used rather like the Warumungu marker. All non-singular O pronouns end in *ka*,[18] whatever the number of the subject.

(15)   *Kapi   ngu-nyu-ta-kurla-ka   yurntu*
      NEG   I-you-tense-2DU-O   hit
      I never hit you two.

Furthermore, this form is used as the base of the possessive form, *kurlu-ka-ngka* 'you du-poss', just as in Warumungu. However, unlike Warumungu, the third person non-singular forms regularly end in *ka,* and there appears to be no inversion marker use of this suffix. To this marker can be compared the Jingili DAT/Objective form *(a)ku* on the free form of non-singular pronouns.

In Warlmanpa (W) and Eastern Warlpiri (EW), several non-singular O pronominal clitics contain the element *ngu :*[19] *lpa-ngu* (W), *ngalpa-ngu* or *ngalpa* (EW) 1pl.iO; *ngu-pala* (W and EW) 2duO;[20] *ja-ngu* (W), *jarra-ngu* (EW) 1du.eO; *nya-ngu* (W) 2plO; *pala-ngu* (W and EW) 3duO; *nganpa-ku* or *nganpa* (EW) 1pl.eO. They occur whether or not the S is non-singular. Unlike Warumungu however, not all non-singular pronouns end in *ngu* or a form resembling *ngu,* and there is no inversion marker use. In the closely related language Mudbura *ngu* is used consistently with the plural S marker *-lu* to indicate non-singular S operating on non-singular O, e.g. *yina-ngu-lu* 3plS-nsgO-plS, third person plural S acting on third person plural O. Gurindji appears to be similar, but the form is *ngku* or *ku* (determined by nasal dissimilation).[21] Again, the alternations parallel those in Warumungu. Unlike Warumungu and Warlmanpa, these languages do not use the *ngu/ngku/ku* form for non-singular O with singular S, partly because it is restricted to occurring with the plural S marker *-lu.*

Although there is no direct parallel to the Warumungu use of *ngkV* as an inversion marker in Mudbura, Gurindji, Warlpiri and Warlmanpa, these languages do contain structures for third person non-singular S operating on first person non-singular O in which the first person pronoun occurs first in the cluster. This stems from the metathesis of S number with O person. The forms are given in Table 6.

TABLE 6
STRUCTURE OF NON-SINGULAR SUBJECT AND OBJECT CLUSTERS

	3pl S 1pl.i O	3pl S 1pl.e O
Warumungu	*anyul-jarni-ngkki*	*ankul-jarni-ngkki*
	1pl.iS-3plO-**ngkki**	1pl.eS-3plO--**ngkki**
Warlmanpa	*lpa-ngu-lu*	*(nganpa-lu)*
	1pl.iO-**ngu**-3plS	(1pl.eO-3plS)
Mudbura	*nga.laa-ngu-lu*	*nganta-ngu-lu*
	1pl.iO-**ngu**-3plS	1pl.eO-**ngu**-3plS
Gurindji	*nga.la-ngku-lu*	*ngantipa-ku-lu*
	1pl.iO-**ngu**-3plS	1pl.eO-**ku**-3plS

Forms such as those in Table 6, containing a first person pronoun (albeit O form) followed by a *ngu* marker to indicate third person acting on first person, may well have suggested the use of *ngu/ngku/k(k)u* as non-singular O markers in Warumungu.

Historically, Warumungu probably had several non-singular pronominal forms ending in *ngk(k)V* or *k(k)V: anyul-jarni-ngkki,* perhaps from an old ERG: *ampu-kku* related to the cognate Arandic *umpə-kə,* and some forms like *ankku* and *arrkku* which contained the form as part of the root. The presence of nasal dissimilation together with the model of a non-singular marker *ngV/ngkV/kV* in neighbouring languages assisted in levelling the paradigm, so that all non-singular

pronouns now end in *ngV/ngk(k)V/k(k)V* (allowing for the split in third person non-singular pronouns).

4. CONCLUSION

The form *ngV/ngkV/kV* appears to be an areal feature in north central Australia, regardless of language family, to indicate that non-singular pronouns or pronominal clitics are acting as O. In Mudbura, Gurindji, Warumungu, Warlmanpa and Wambaya it is restricted to non-singular pronouns. Mudbura and Gurindji use it only for non-singular O operated on by non-singular S. Wambaya and Warumungu use it for all non-singular O, but in Warumungu it is not overtly realised for several forms. None of the neighbouring languages show the inversion use that Warumungu does; however, the languages that show person inversion have partly analogous structures with *ngV/ngkV/kV*. This areal marker *ngV/ngkV/kV* may be derived as McConvell (1980) suggests from an augment *-ku,* or may reflect a DAT, as the Arandic data suggests. In particular instances, it may be derived from other forms, such as an ERG case marker.

NOTES

1. This paper stems from work that Luise Hercus, Harold Koch and David Nash and I are doing on central and southern Australian languages. I am grateful to the others for their help.

2. Warumungu has a contrast between long voiceless stops and short voiced stops. For stop-initial morphemes, the contrast is predictable. However, I shall retain the distinction in citing full forms. Hence I shall write *k(k)V* and *ngk(k)V*, rather than *kkV* and *ngkkV*. The form of the vowel is determined by the stem-final vowel. I shall write this as V.

3. The data used in this paper comes from the following sources: Alyawarr (Alyawarra) Yallop (1979); Jingili (Djingili) Chadwick (1975); Kaytej Koch (n.d.); Mudbura McConvell (1980, 1988); Wakaya (Wagaya) Breen (1974); Wambaya Hale (1959); Warlmanpa Nash (1979); Warlpiri (Walbiri) Hale (1973); Warumungu Heath and Simpson (1982).

4. I thank Peter Austin for pointing out the relevance of Heath's work.

5. Younger speakers sometimes put ERG suffixes on S form pronouns, e.g. *arni* 'I', *arni-njji* 'I-ERG' when used with third person singular objects.

6. Independent pronouns, especially sentence initially, may add an initial epenthetic *y*. Hence the interjection *yangi!* 'Hey you !' *(angi* 2sg). This epenthesis is more common for the second person singular form than for the other pronouns.

7. I do not properly understand the meaning and use of these forms.

8. First person plural exclusive forms sometimes have velar rather than alveolar nasals.

9. These forms were recorded by Jeffrey Heath. It is not entirely clear under what circumstances they are used instead of the regular object form. A form like *anyuljarnikki* is potentially ambiguous between having a first person subject and a third person subject, given the allomorphy *ngk(k)i/k(k)i* of the inversion marker.

10. Warumungu, like its neighbours Warlmanpa and Warlpiri, shows 'dual neutralisation' (a prohibition on combining dual pronouns with non-singular pronouns). In Warumungu the

plural is used instead of the dual when such situations arise. Thus the form *wurunyu akuljarni* can mean 'you two hit them two', 'you mob hit them two', 'you two hit all of them' or 'you mob hit all of them'.

11.   Parentheses around the *r* indicate an alternation between alveolar and retroflex consonants.

12.   In Warumungu and neighbouring languages, there are alternations between plain stops and nasal plus stop clusters, as in the pronoun clusters *angajju, anganjju; arnampukku, arnapukku*. There are alternations between plain nasals and nasal plus stop clusters, as in the causative alternation *piliyi-rni-nyi* 'good-FACTitive-PAST.PUN' 'made good' and *piliyi-rnti-yina* 'good-FACT-PAST.CONTinuous' 'was making good', and as in the noun alternations *yarni-njji, yarnti-jji, yarnti-njji* 'one-ERG' (ABS *yarnti*) and *walingi-njji, walingki-jji* 'slow' (possibly with an old ERG marker). It is not always clear whether the alternation is caused by nasal dissimilation of nasal plus stop cluster, as in Ngumbin languages (McConvell 1988), or by cluster simplification or by addition of a stop, as in Kaytej (H. Koch, personal communication). In Warumungu, the alternations occur under varying conditions.

13.   The voicelessness of the velar stop in *jarni-ngkki,* in contrast to the voiced velar stop in the ERG allomorph *ngkV,* is probably due to the complex *anyul-jarni-ngkki* containing five syllables.

14.   The forms that retain the *l, ayilinginyi and apilinginyi,* would be reconstructed with an *l.* See the correspondences in Table 5.

15.   The high front vowel realisation of the *-ngV* is due to regressive assimilation from the final *-nyi*. This form probably corresponds to the Arandic *-nhe* (Harold Koch, personal communication).

16.   The proto Arandic reconstructions were provided by Harold Koch.

17.   While the Arandic languages have free pronouns and no pronominal clitics, Kaytej has the beginnings of pronominal clusters with a complex reflexive, e.g. *atye-wenhe* 1sgS-REFL, *nte-the* 2sgS-1sgO, *atye-ne* 1sgS-2sgO (Koch n.d.).

18.   The historical status of the a vowel in Wampaya is not clear, because Wambaya attaches tense markers to *ka,* some of which change the vowel to a high vowel.

19.   Both these languages show some alternation between stops and nasal plus stop clusters. The ERG allomorph on disyllabic words in both languages is *ngu*, whereas in Western Warlpiri it is *ngku*. In Western Warlpiri, the relevant object pronominal forms are *-ngali(ngki)* 1du. i; *-jarra-ngku* 1du. e; *pala-ngu* 3du and *ngku-pala* 2du.

20.   The *ngu* here is probably unrelated, being derived from the second person singular object marker *-ngu (ngku* in Western Warlpiri).

21.   McConvell (1980) derives the Ngumbin forms *ngku* and *ngu* from original ŋ- final pronominal clitics followed by a link *-ku.*

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